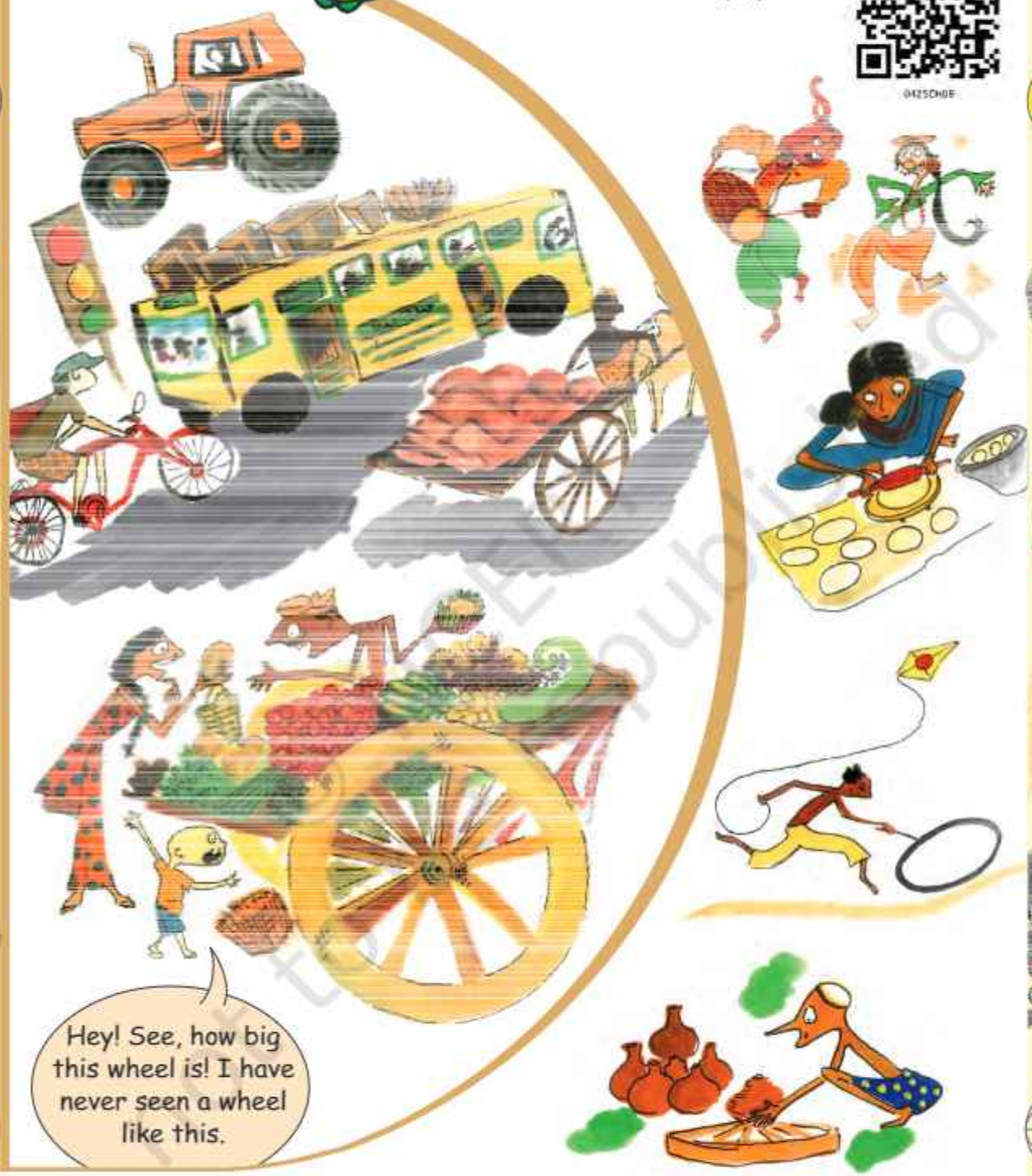
8 Carts & Wheels



You must have seen many such round things around you.

List some more in your notebook.

Round Bangle

Have you ever gone to a bangle shop?

* Guess which of these bangles is of your size.

* Take a wire and make a bangle for yourself. Can your madam or mother wear this bangle? _____

* A bangle can be used to trace a circle. What are the other things around you that you can use to trace a circle?

_____ _____ _____

_____ _____ _____

* Trace a circle with the help of some of these things in your notebook or on the ground.

Which thing makes the smallest circle?

Which thing makes the biggest circle?

Games with Circles

Children are playing some games .....

Game 1

Game 2

Do you play these games?

Which song do you sing when you play these?

Play these games in your school.

Why do we make a circle in each of these games?

What if a rectangle was made? Discuss.

* Think of some other games you play by making circles.

Making a Circle

Naina, Chippu and Ariba want to play a game. They want to make a big circle on the ground. But they cannot make it by tracing. So, Ariba tries to draw a circle with a stick.

Chippu and Naina — It does not look like a circle at all.

Ariba — OK! Why don't both of you try?

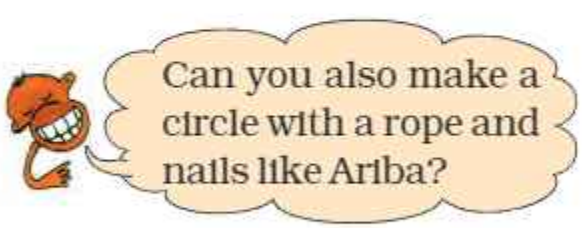
Chippu and Naina both make circles on the ground.

- Is any of these a good drawing of a circle? Discuss.
- Can you draw a circle on the floor with a chalk? Try.
- Also draw a circle in your notebook using a pencil.
- Look at the circles drawn by your friends. Who has drawn the best circle?

The purpose of this exercise is to give opportunities to each child to make freehand circles. They can also make circles on the ground with a stick. They can compare different drawings to get an intuitive sense of the shape of a circle.

Making a Circle with a Rope

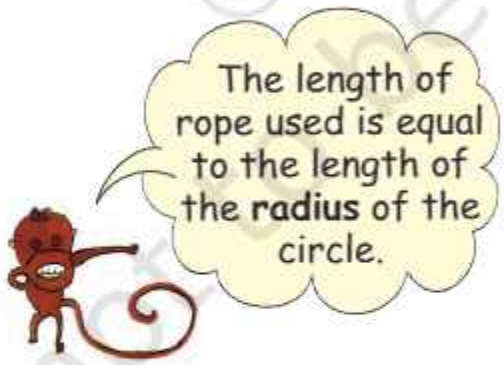
Ariba decided to use nails and a thread to make a circle on the ground. She took a thin rope and tied nails on both ends of the rope. Then she made a circle with the help of her friend. Look at the picture and see how they are making the circle.

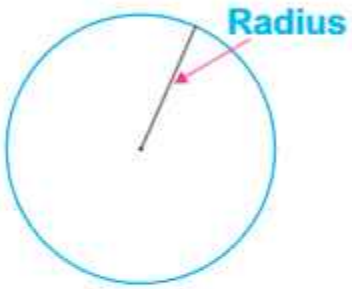


- Do the activity in small groups. Each group should take a rope of a different length. See the circles made by different groups.
- Which group made the smallest circle? _____

  How long was their rope? _____
- Does a longer rope make a bigger circle? _____

  Why is it so?

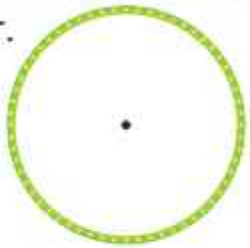




- What was the radius of the smallest circle? _____

The purpose of this exercise is to help children make different circles, measure the lengths of their radii and see how the size of a circle changes with its radius.

❊ Draw the radius of this bangle using a ruler. Measure the length of the radius.



Now see what your friends have drawn. Discuss the length of the radius they measured. Is it the same as yours?

❊ Draw the radius of these circles.

Guess which circle has the longer radius._____

Measure the radius of both the circles using a ruler.

Write the length of their radius.

❊ Radius of the green circle _____

❊ Radius of the blue circle _____

Find out

❊ Measure the radius of the wheels of a bicycle or a bullock-cart. You can use a thread or a measuring tape.

Are all the wheels of a bicycle or a bullock cart of the same radius? _____

❊ Have you seen a tractor or a road roller?

❊ Which is the biggest wheel you have ever seen?

❊ Are all wheels of a tractor or road roller of the same radius?

Children need a lot of interesting exercises of making and measuring the radius of circles of different sizes. They can also make wheels and carts.

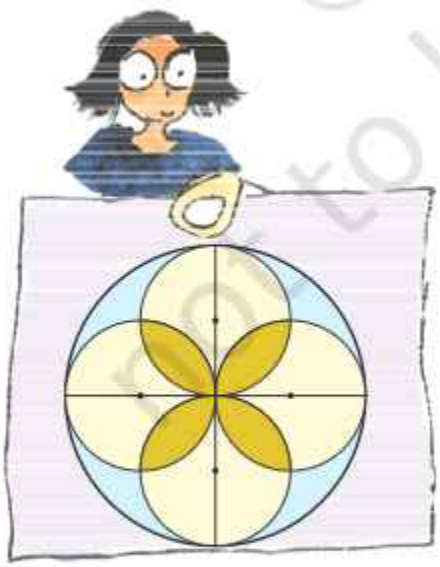
* Lali and Kali are tied to a pole with ropes. Kali has a longer rope. Who can look for more grass to eat?

_____

Daljeet's Design

Daljeet has made these designs using a compass.

His sister came and started making more designs with him.



Do you want to make such designs?

To make such designs you will need to use a compass.

Using a Compass

* Have you seen a compass before? How will you use this to make a circle?
  - —Open your compass.
  - —Press the tip of the compass on the paper. Hold the compass from the top.
  - —Without moving the tip, try to move the pencil around.
  - —Do you get a circle?

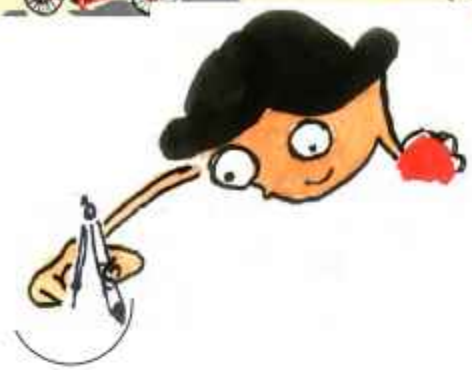
Look for a mark where you had kept the tip of the compass.

This mark is the **centre** of your circle.

* Is this circle better than the one you made earlier without a compass? Draw the radius of this circle and measure it.
* Now you can make your own designs like Daljeet had made. How many did you make?

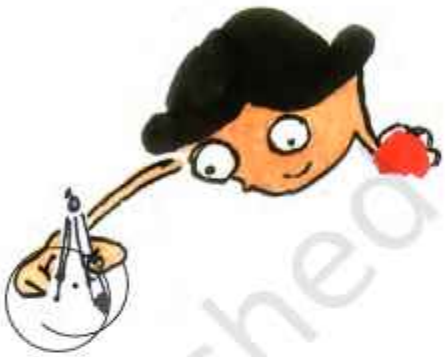
Guess how this design has been made. Use a compass to make a similar one in the box.

Encourage children to explore their own designs with a compass. This will also give them more practice in drawing circles with a compass.



Is It a Circle?

Naina was making a circle.



Ravi asked her for an eraser. She kept her compass and gave him the eraser. Then she started again to complete her circle. But she got this.

Guess

* Why did Naina get such a drawing? Discuss.

Can a circle have more than one centre?

Another day Naina was using a compass to make circle. But it came out like this.

* Did any one of you ever get a shape like Naina's?

Find the Centre

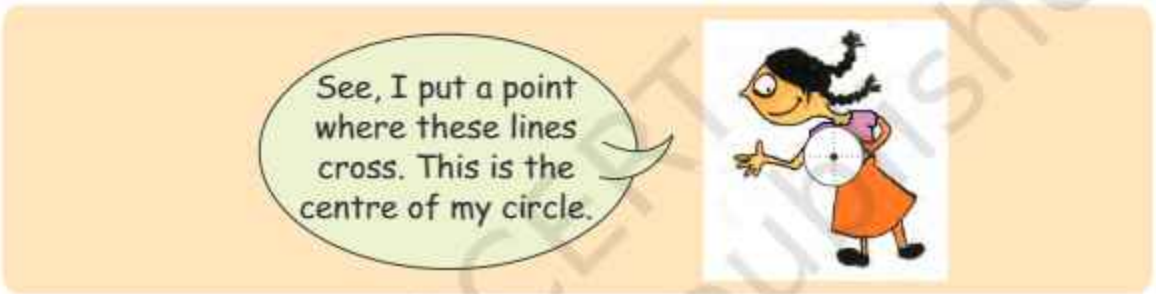
Sadiq and Sameena want to make circles for themselves.

Then they cut their circle.

She folded her circle into half.

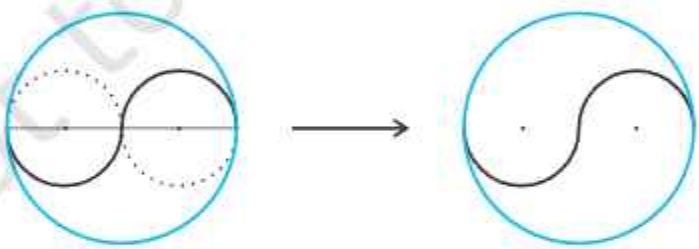
Then she folded it again like this.

She opened the folded circle.



❊ Now you trace a circle on a paper using a bangle. Cut it. Then find its centre like Sameena did.

We can also make the design on page 88 like this. How did you do it?



Balancing Act

Can you balance a plate on your finger?

You also try to balance a plate or a round lid on your finger. Where does it balance?

Spin the Top

Zakir, Appu, Naina and Guddo were getting bored. It was raining. So they could not go out to play.

Suddenly Appu said — Let's each make a top.

They took a piece of cardboard traced a circle on it. Then they made a hole and put a matchstick in it.

Now everybody was excited to spin their tops which looked like this.

Guess

- Whose top will not spin at all? _____
- Whose top will spin a little? _____
- Whose top will spin the best? _____
- In whose top is the stick nearest to the centre? _____

Make Your Own Top

You also make your own top and play this game.

- To make the top spin well, where will you make the hole?

9 Halves and Quarters

Mintu cat and Mottu cat were friends. Once they stole a chapati from Malini's kitchen. I will take it — said Mintu. No, I will take it — said Mottu. While they were quarrelling, there came Tittu Monkey. Hi! What is the problem? why are you quarrelling? — he asked. "We don't know how to divide this chapati between us — the cats said. OK! don't worry. I will divide the chapati equally for both of you — he said. Clever Tittu divided the chapati like this:

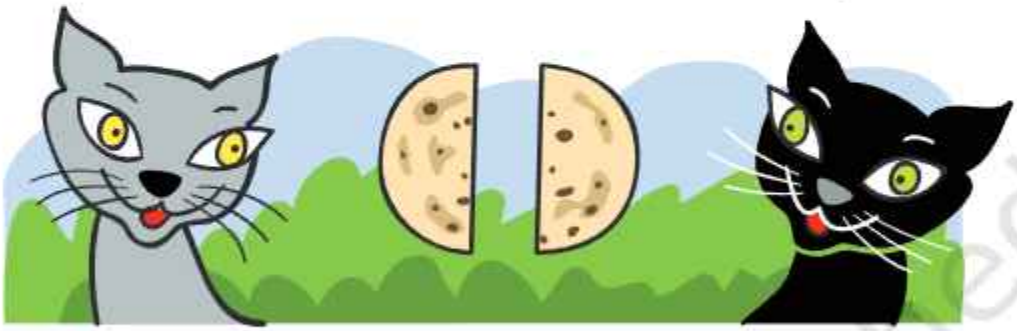
These are not equal, the left part is bigger — Mintu and Mottu said. Oh, no problem, I will make it equal — Tittu said. He then cut a part of the left piece and ate it.

Oh! Now the right part is bigger — the cats cried. I am sorry — said Tittu. He cut a part from the bigger piece and ate it. When there was only a small piece remaining, he said — This is my share for the work. Tittu then quickly ate the last piece and climbed the tree.

Half-Half

- If the cats ask you to divide the chapati equally, how will you divide it?

If you do not cheat like Tittu, the cats will have these parts.

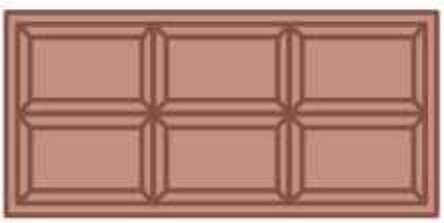


Half of Half

- If two more cats come for food, how will you divide one chapati equally for four cats?

Half of Many Pieces

Rani got a chocolate. She divided it equally and gave half to her friend Reena.



- Circle the portion that Reena got.

How many pieces of chocolate are there? _____

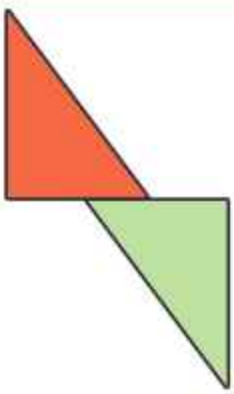
How many pieces were left with Rani? _____

Many Shapes from a Half Sheet

Take a piece of paper. Cut the sheet into two equal triangles so that each triangle is equal to half of the sheet.

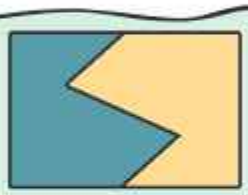
Shade the two triangles with different colours.

- Draw different shapes using these triangles. One such shape is shown here.



Many Ways to Cut into Half

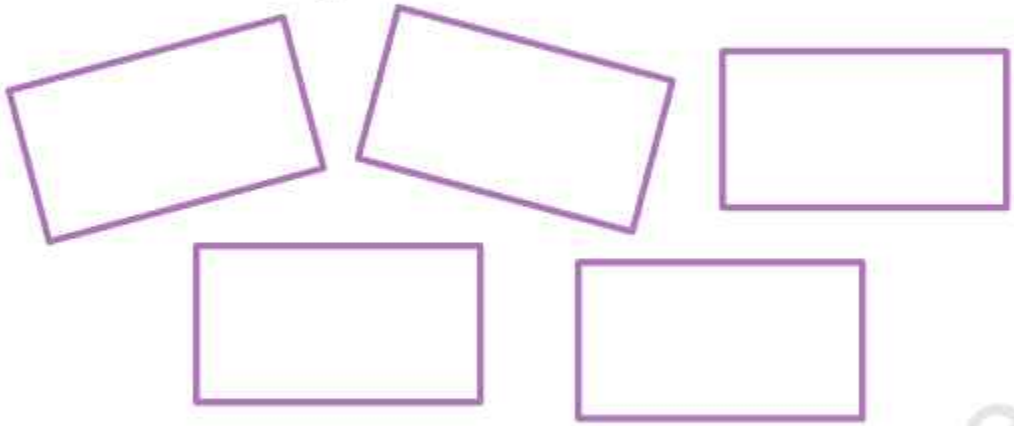
I have made a rectangle into two equal parts like this. Each part is **half**.



We write it as $\frac{1}{2}$. It means 1 part out of 2. You can check if these parts are equal. Try keeping one on top of the other.

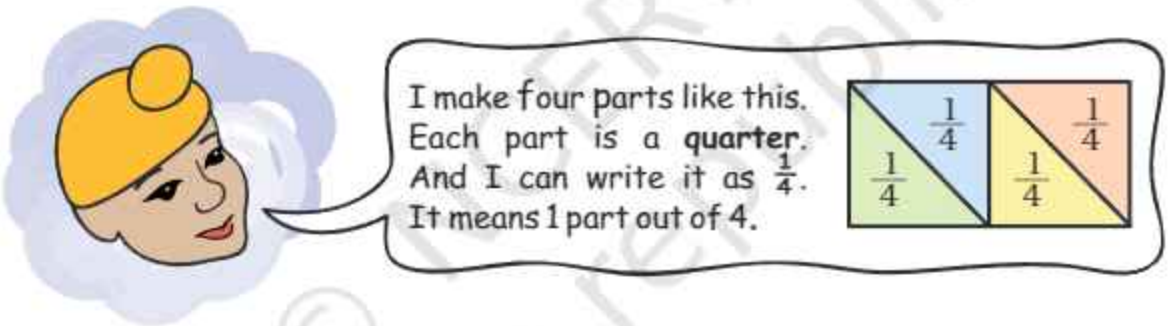
In how many different ways can you cut a **rectangle** into half?

- Draw 5 different ways .

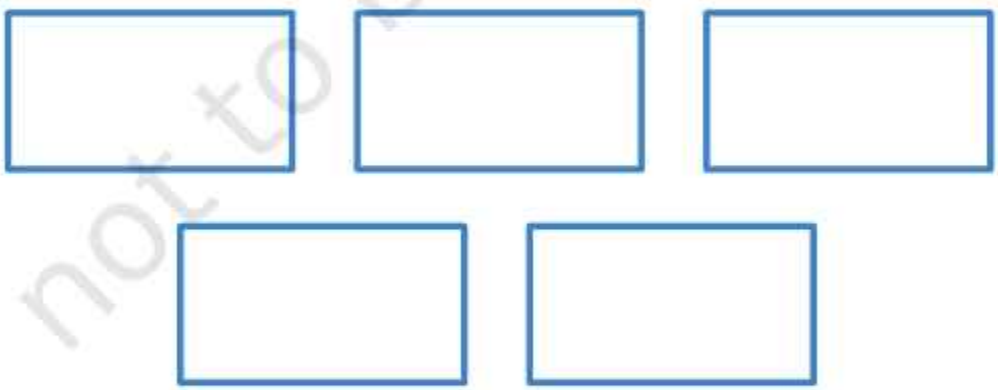


Can you check if they are equal?

Many Ways to Make Quarters



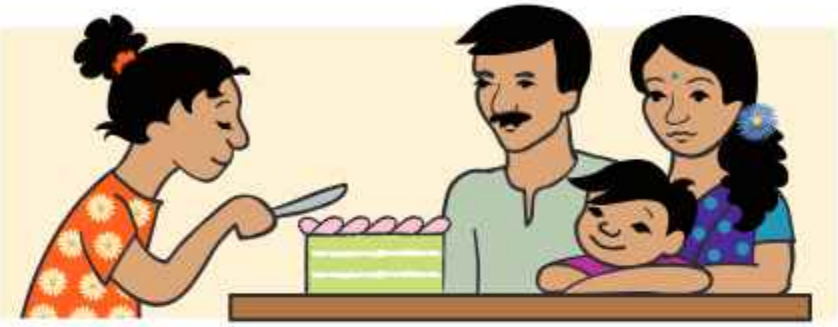
- In how many different ways can you cut a rectangle into four equal parts? Draw 5 different ways.



Can you check if they are equal?

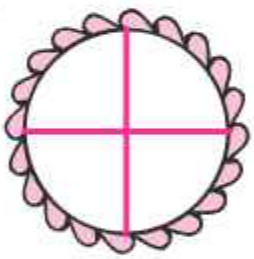
Cutting the Cake

Rajni's father brought a cake. She divided the cake into 4 equal parts — for herself, her brother Raju, her father and her mother.



- Colour each share with different colours.
- How much does each get? _____

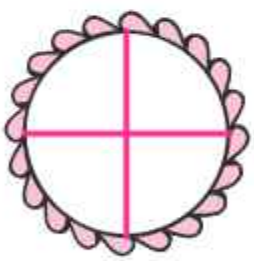
- Father gave his share of cake to Rajni. Now colour the total part that Rajni will get.



- Out of 4 parts Rajni will get ____ parts, which is equal to half of the cake.

  So she can write it as $\frac{\quad}{4}$ or $\frac{1}{2}$.

Before Rajni's father gave his share to Rajni, she had only $\frac{1}{2}$ of 'half the cake', which was $\frac{1}{4}$ of the total cake.



- Colour the share Raju got.

- How much of the cake do Rajni and Raju together get? Colour their total share.

  Altogether they get 3 parts out of 4, so we can write it as $\frac{3}{4}$.

Greedy Kundu

Kundu is a greedy man. Whenever he goes to the market, he wants to get more and more but doesn't want to spend much money.

One day he wants to eat pumpkin *halwa* (sweet dish). He tries to buy a big pumpkin with only ₹10. He asks the first pumpkin seller the price of a big pumpkin.

First pumpkin-seller — $\frac{1}{4}$ of this pumpkin is for ₹10.

- This full pumpkin will cost ₹ _____.

Kundu — Eh! For ₹ 10, you should give me $\frac{1}{2}$ of this pumpkin.

First pumpkin-seller — Then you go to the next seller, he can give you $\frac{1}{2}$ of such a big pumpkin for ₹ 10. I keep only good quality pumpkins.

Kundu walks to the next seller and looks for a pumpkin of the same size.

Kundu — How much of this pumpkin will I get for ₹10?

Second pumpkin-seller — Half.

- This full pumpkin will cost ₹ _____.

Kundu— Eh! Why not give me $\frac{3}{4}$?

Second pumpkin-seller — Run away! Go, get your pumpkin from that man. He sells such bad vegetables that he will even give you a full pumpkin of this size for ₹ 10.

The greedy Kundu walks to the next pumpkin seller. He looks at a pumpkin of the same size and asks him —will you give me this big one for ₹ 10?

Third pumpkin-seller — Why don't you climb the roof of that house? You can get pumpkins free from the plant itself!

Kundu is very happy. He climbs the roof of that house and then .....

Using a Price List

a) How much does $\frac{1}{2}$ kg of tomatoes cost?

b) Which costs more – $\frac{1}{2}$ kg of onions or $\frac{1}{4}$ kg of carrots?

c) What is the price of $\frac{3}{4}$ kg of potatoes?

d) Keerthi is going for shopping. She has only ₹ 20 with her. Can she buy all the things in her shopping list?

e) Make two questions yourself from the price list.

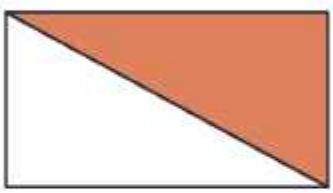
1.

2.

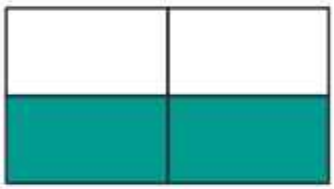
Item	Price in ₹ (per kg)
Tomato	8
Potato	12
Onion	10
Carrot	16
Pumpkin	4

Practice Time

a) What part of the whole is coloured? Write below each shape.

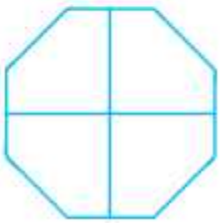


_____



_____

b) Colour that part of the shape which is written below.

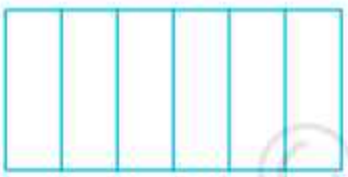


$\frac{1}{2}$

$\frac{3}{4}$

$\frac{3}{4}$

$\frac{1}{4}$



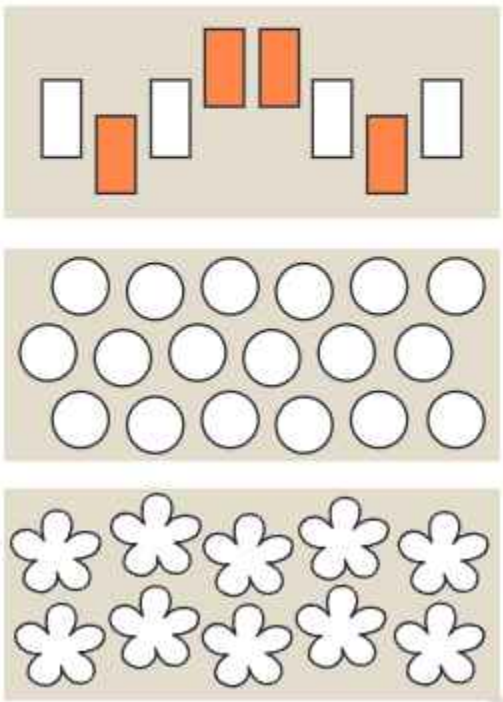
$\frac{1}{2}$

$\frac{3}{4}$

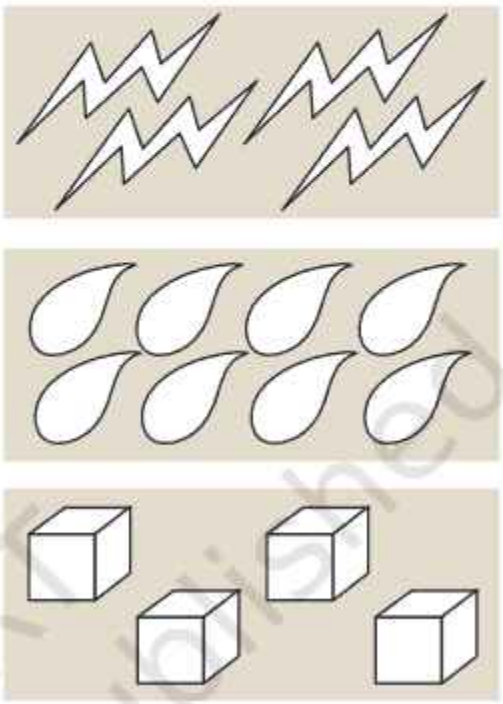
c) ***Cut in half***

Draw a line which divides these shapes into half.

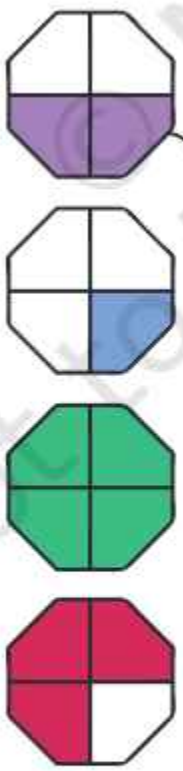
d) Colour half the number of shapes as shown here.



e) Colour $\frac{1}{4}$ of these shapes.



f) Match the coloured part as shown.



Quarter	$\frac{3}{4}$
Half	$\frac{4}{4}$
Three Quarters	$\frac{1}{2}$
Whole	$\frac{1}{4}$

g) ***Make the other half***

$\frac{1}{2}$ of the picture is drawn here. Can you complete the picture by drawing the other half?

h) This is a quarter of a picture. Can you complete it? How many more quarters will you draw to complete it? _____

Half and Quarter of a Metre

Using your metre scale, cut a string of one metre.

- On this string, mark the length $\frac{1}{2}$ metre, $\frac{1}{4}$ metre and $\frac{3}{4}$ metre.
- Using your string, draw a line of length $\frac{1}{2}$ metre on the floor. How many centimetres long is the line? _____

So

$\frac{1}{2}$ metre= ..... cm

$\frac{1}{4}$ metre= ..... cm

$\frac{3}{4}$ metre= ..... cm

Can you see that when we add $\frac{1}{2}$ and $\frac{1}{4}$ we get $\frac{3}{4}$?

Sharing Milk

This bottle is full of milk and it holds one litre. The milk is put into 4 other bottles so that each bottle has $\frac{1}{4}$ litre of milk.

- Shade the bottles to show the level of milk in each.

Remember, 1 litre=1000 millilitres

- How many millilitres of milk does each bottle have? _____

Shan poured 1 litre of milk into two bottles so that the first bottle holds $\frac{3}{4}$ litre and the other holds $\frac{1}{4}$ litre.

- Shade the level of milk in each bottle.
- How many millilitres of milk does each bottle hold?

Balance the Weight

- Choose from the weights above to make the two pans equal. In how many ways can you do it?

a) Draw the weights in the empty pan.

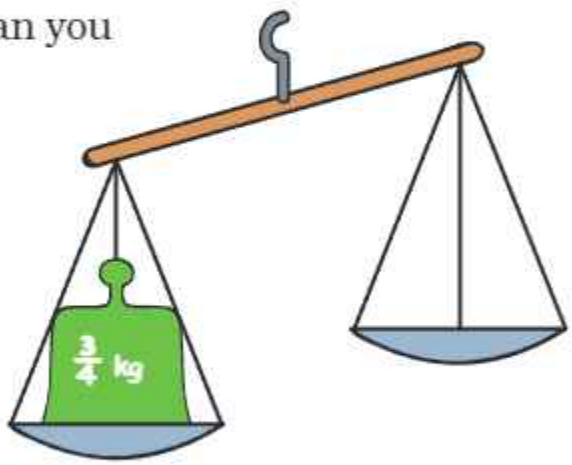
Remember, 1kg =1000 g

b) In how many different ways can you balance this weight of $\frac{3}{4}$ kg?

1) .....

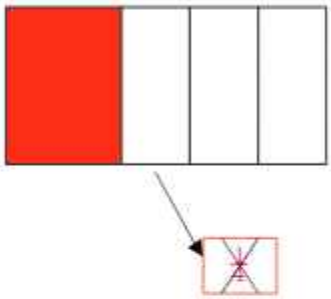
2) .....

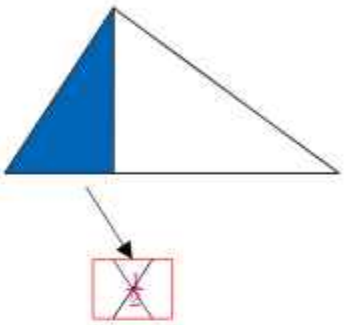
3) .....



Why is It Wrong?

Kannan shaded some parts as shown. But his friend Mini says that it is wrong. Explain why it is wrong.





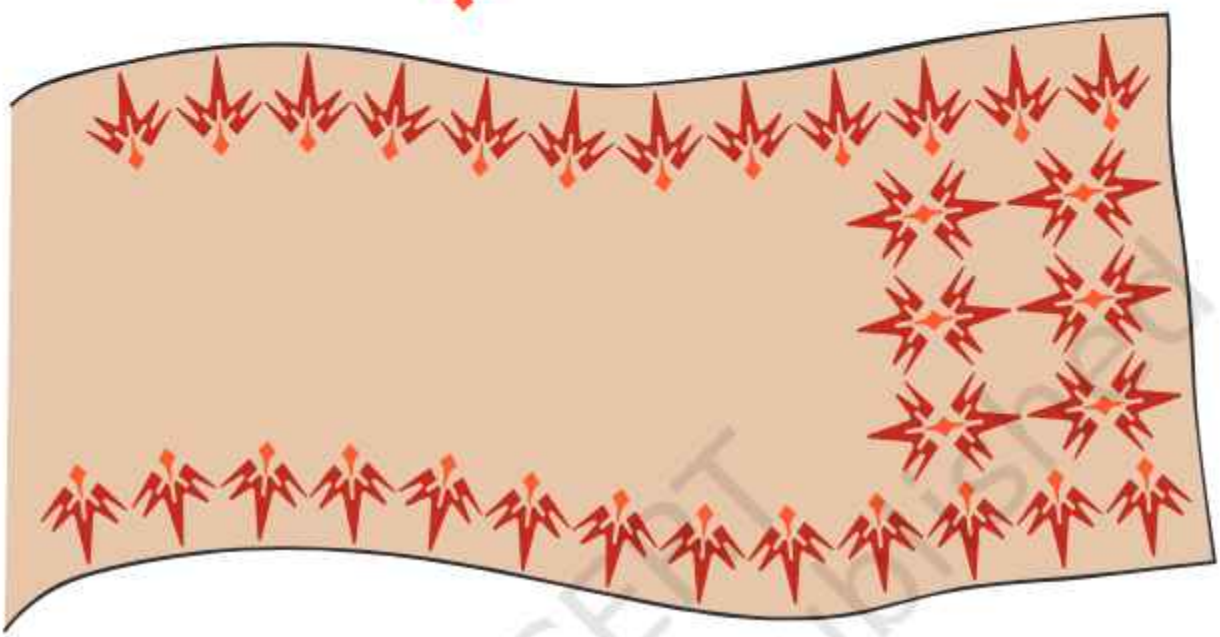
Practice Time

- There are 60 mangoes. $\frac{1}{2}$ of them are ripe. How many mangoes are ripe?
- There are 32 children. $\frac{1}{2}$ of them are girls. How many children are boys?
- There are 20 stars. A quarter of them are red. How many stars are red?

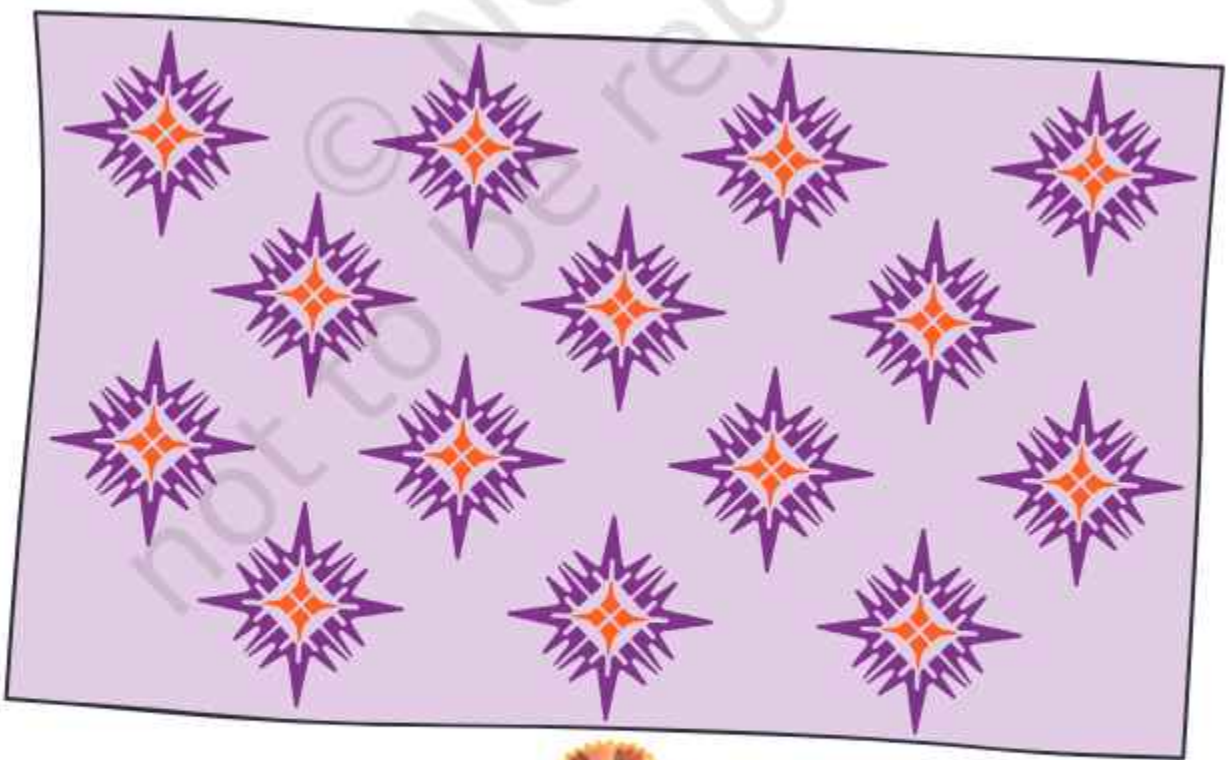
  How many are not red?
- Ravi wants a pencil. It costs ₹ 2. He gives a one-rupee coin, one half-rupee coin and one quarter-rupee coin. Is it enough?

10 Play with Patterns

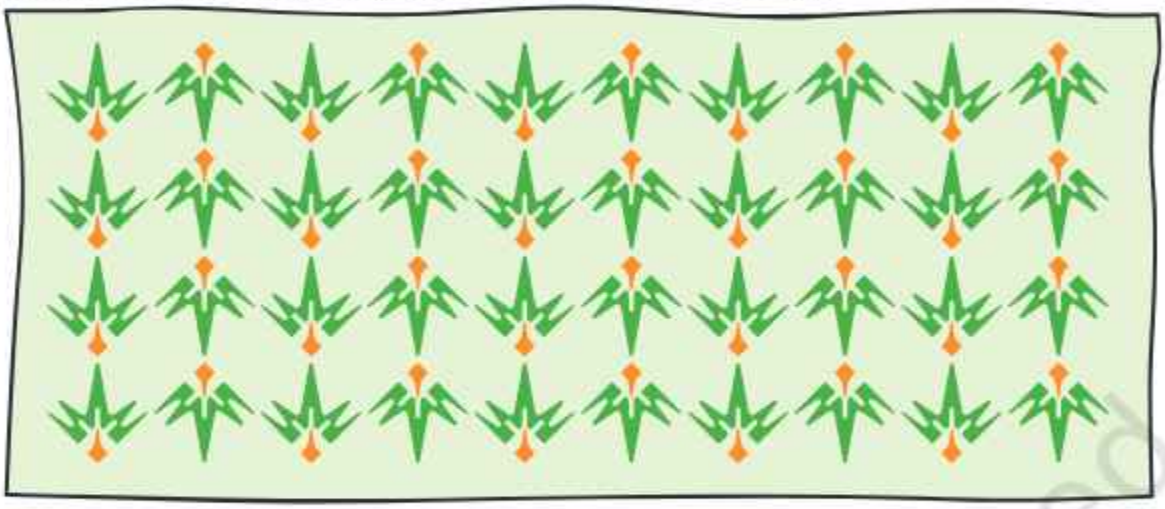
Tinu used this block  to make a sari.



Next he made this bedsheet with the same block.

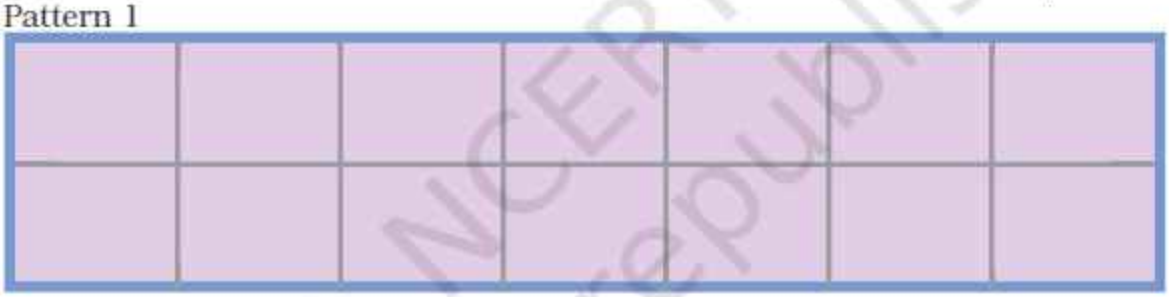


He also made this *dupatta* with the same block.



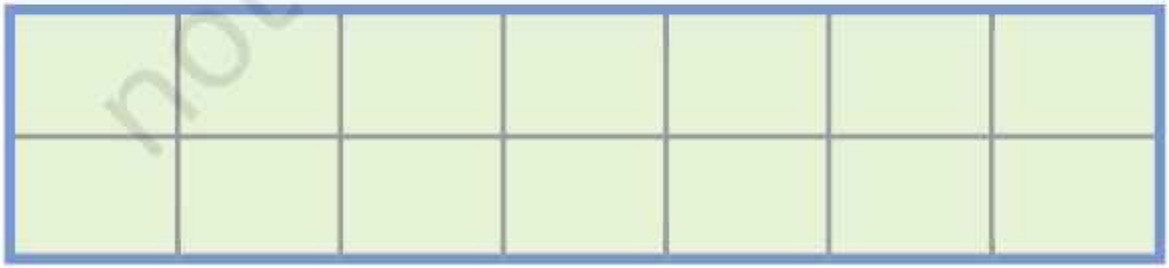
Can you see how Tinu has made different patterns using the same block? Now you too make 3 different patterns using  .

Pattern 1

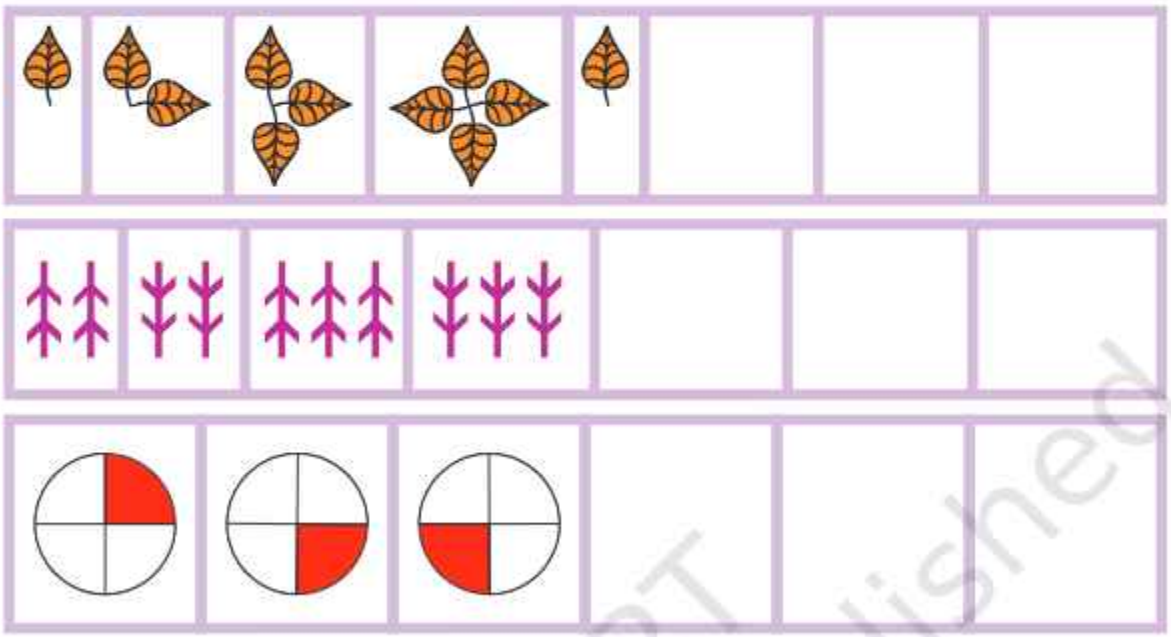


Pattern 2

Pattern 3



Yamini has used her blocks to make a few patterns. Help her to take these patterns forward.



We can also make patterns with numbers and letters. Below are a few examples. Can you take them forward?

ABC DEF GHI

28Z 27Y 26X

864 764 664

9 109 209

Now write your own number patterns.

Make a pattern without numbers.

No Number Comes Twice

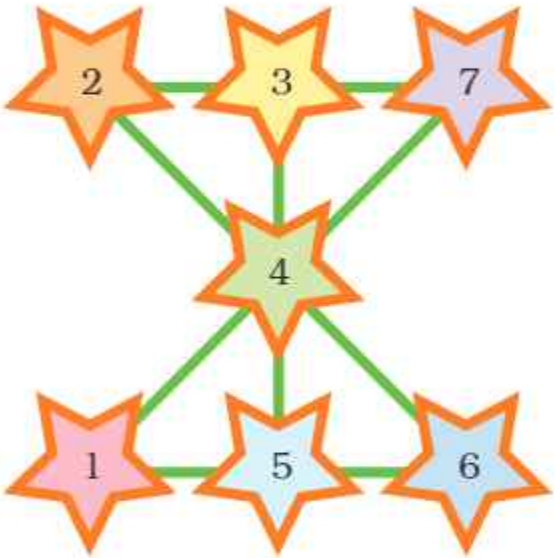
Look at the number box. Can you see a pattern?

1	2	3
3	1	2
2	3	1

Now you try writing the letters — A, B, C in the box so that no letter comes twice in any line.

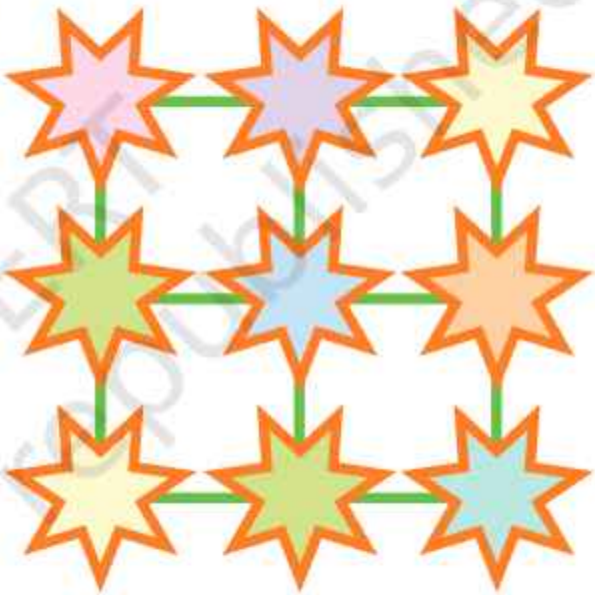
We have not used the terms row or column here, but using the word 'line' teachers may discuss the idea of rows and columns.

Magic Patterns

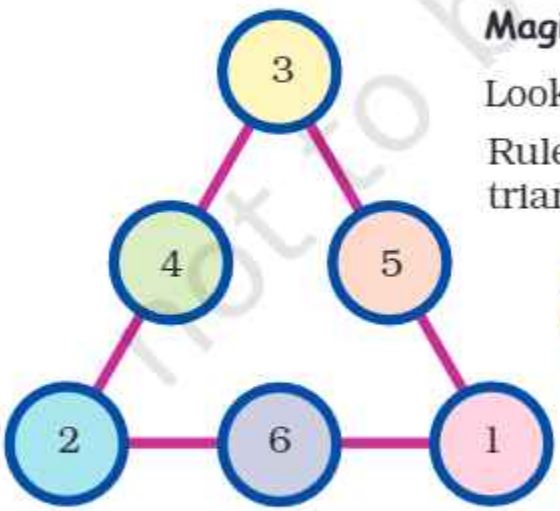


Look at the pattern of numbers 1 to 7 . See how each line adds up to 12!

Now you fill these stars. Use numbers 1 – 9 and the **rule** that the numbers on each line add up to 15.



Magic Triangles



Look at this number pattern .

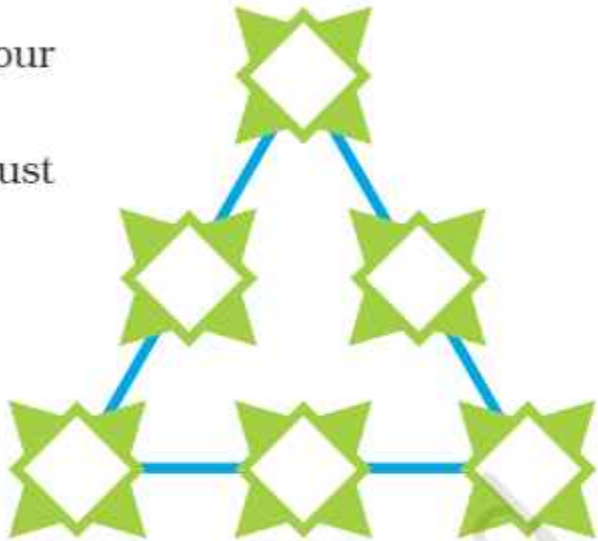
Rule: Numbers on each side of the triangle add up to 9.

3 + 4 + 2 = 9

See if the other sides of the triangle also add up to 9.

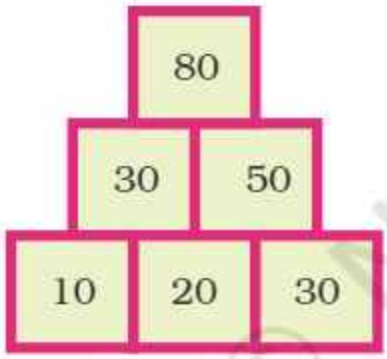
Now use numbers 1 – 6 to make your own magic triangle.

Rule: Numbers on each side must add up to 10.



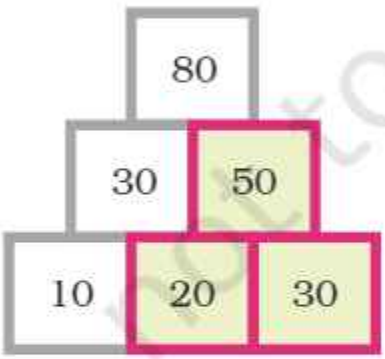
Number Towers

Numbers can be arranged as a tower. We start from below and get this number pattern.

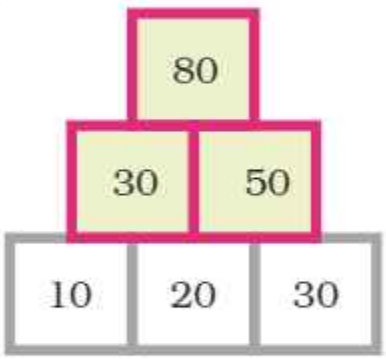


Can you see the rule for this pattern?

Rule: We add 2 numbers below to get the number in the box above them.

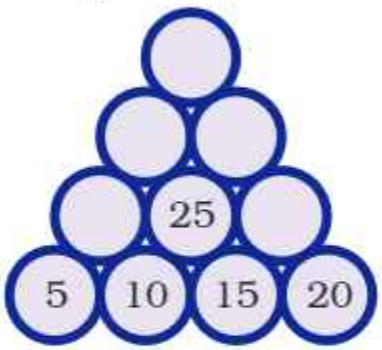


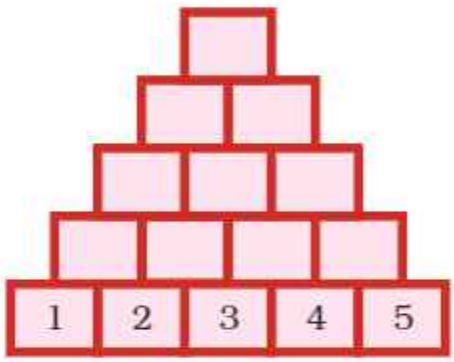
20 + 30 = 50



30 + 50 = 80

Using the same rule, complete these number towers.





The Same Sum Rule

Some friends are playing with number cards. See how they add.

11	+	16	=	27
12	+	15	=	27
13	+	14	=	27

Can you see the rule which gives us the same sum each time?

Rule: We get the same sum when we add the two numbers —

First from left	and	First from right
Second from left	and	Second from right
Third from left	and	Third from right

Now you write any number and the three numbers after that. Make a pattern using the rule.

See if you get the same sum.

	+		=	
	+		=	

Patterns with Addition

$1 + 2 + 3 = 6$

$2 + 3 + 4 = 9$

$3 + 4 + 5 = 12$

Oh! The sum grows by 3 each time.

Here, the sum grows by 4 each time.

$1 + 2 + 3 + 4 = 10$

$2 + 3 + 4 + 5 = 14$

$3 + 4 + 5 + 6 = 18$

Now, you try to make such a pattern with 5 numbers in order.

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

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

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

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

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

Does the sum grow by 5 each time?

Secret Messages

Yamini explained the rule — Numbers have been used for letters.

For example, 'J' is 10, 'P' is 16. So JUMP is 10 21 13 16 .

* Complete this list of letters and numbers to help you.

A	B	C	D	E
1	2	3	4	5

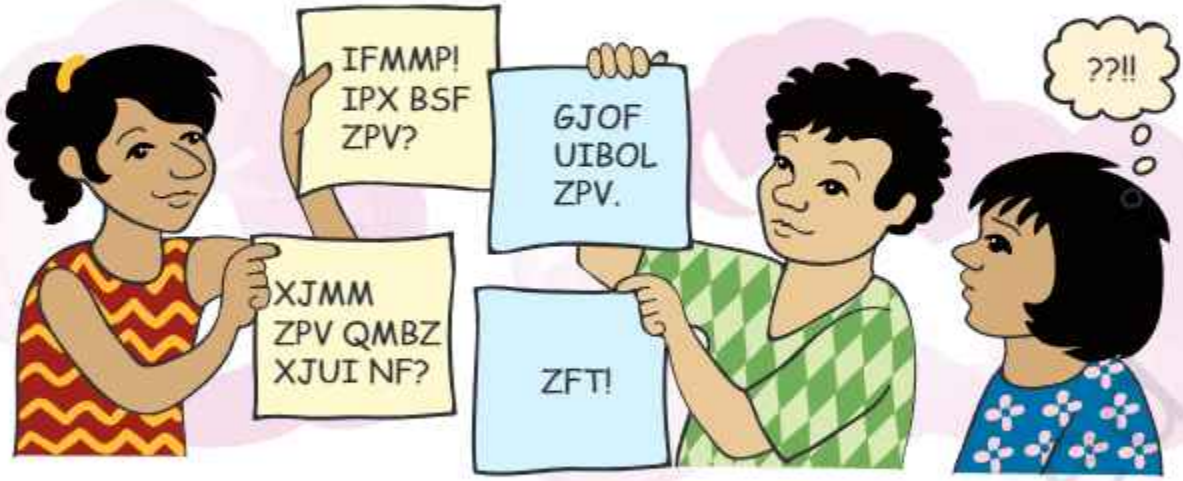
* Teenu wants to write to his friend 'Good Morning'.

What will he write by using the same rule?

* If we change the rule and write 1 in place of 'B', 3 in place of 'D' and so on, then how will we write 'Let Us Dance'?

Coding and decoding secret messages is also a part of recognising patterns. Recognising rules is important for the development of mathematical thinking.

More Secret Messages



Shablu and Jaggu are playing a game. They are writing some secret messages. But Kahuli is not able to understand them. So Jaggu explained the rule —

Jaggu – You see, we have changed each letter by its next letter. That is, we write 'G' in place of 'F', 'O' in place of 'N'. So YES becomes ZFT.

Kahuli – Oh! Now I understand.

Kahuli – See what I have written XF BSF GSJFOE T

* What was Kahuli's secret message? _____
* What did Shablu and Jaggu write?

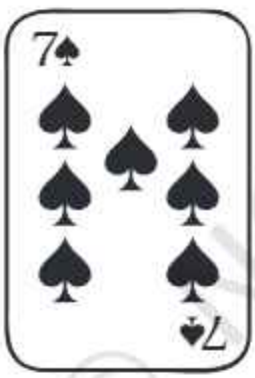
  _____
* Use the same rule to write — 'Meet me on the moon'.

  _____
* Make different rules and ask your friends to crack the secret message.

Upside Down

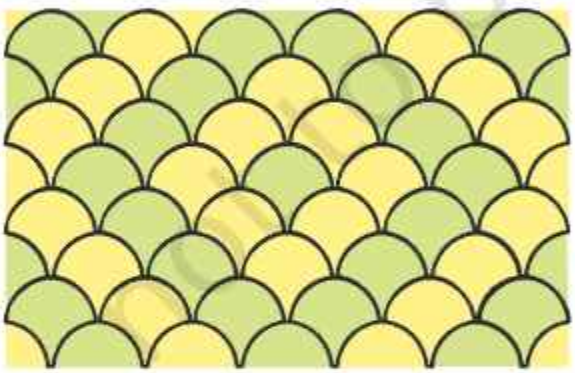
Anisha is playing. She is showing her friends that she can stand on her head.

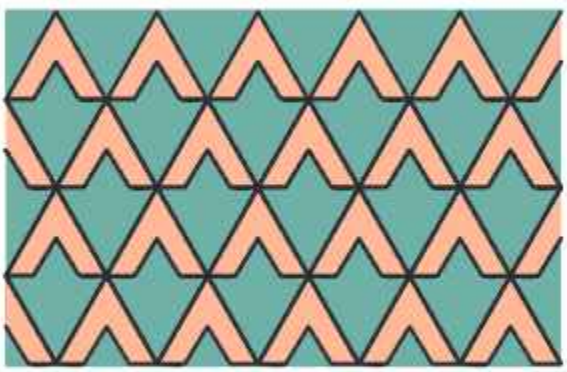
Now, Anisha is playing with this card. Draw what it will look like when upside down.



Floor Patterns

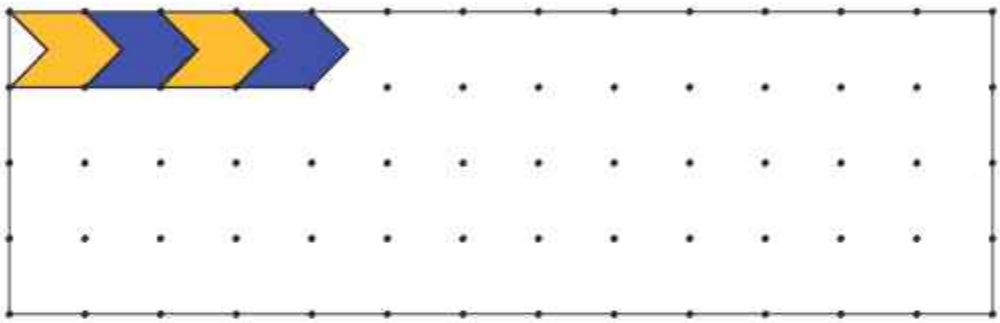
Have you ever seen a floor with tiles of these shapes?





These designs are made by covering the floor completely with tiles that fit into each other without any gaps.

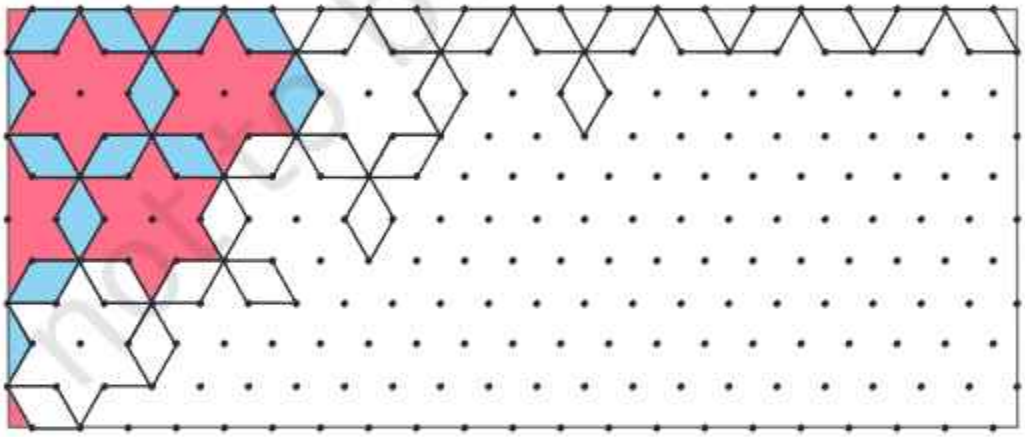
a) Now, you cover this floor with this tile.



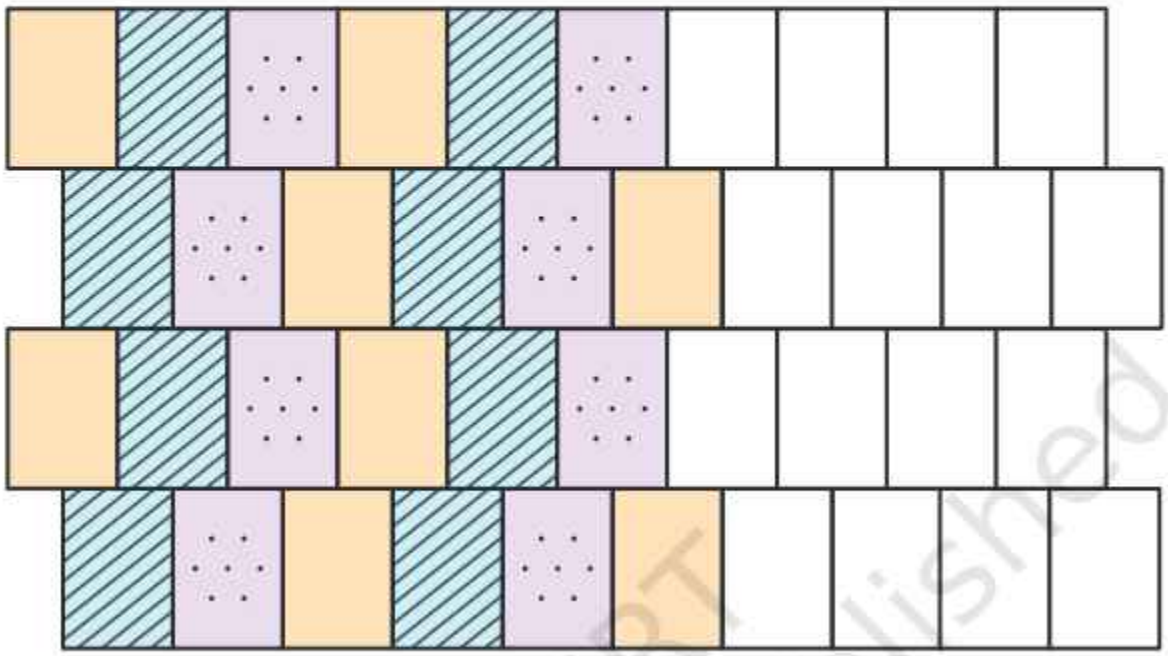
Can you make such a floor design with a tile like a circle?

b) Try with this green tile without leaving a gap. Could you do it? Discuss with your friends.

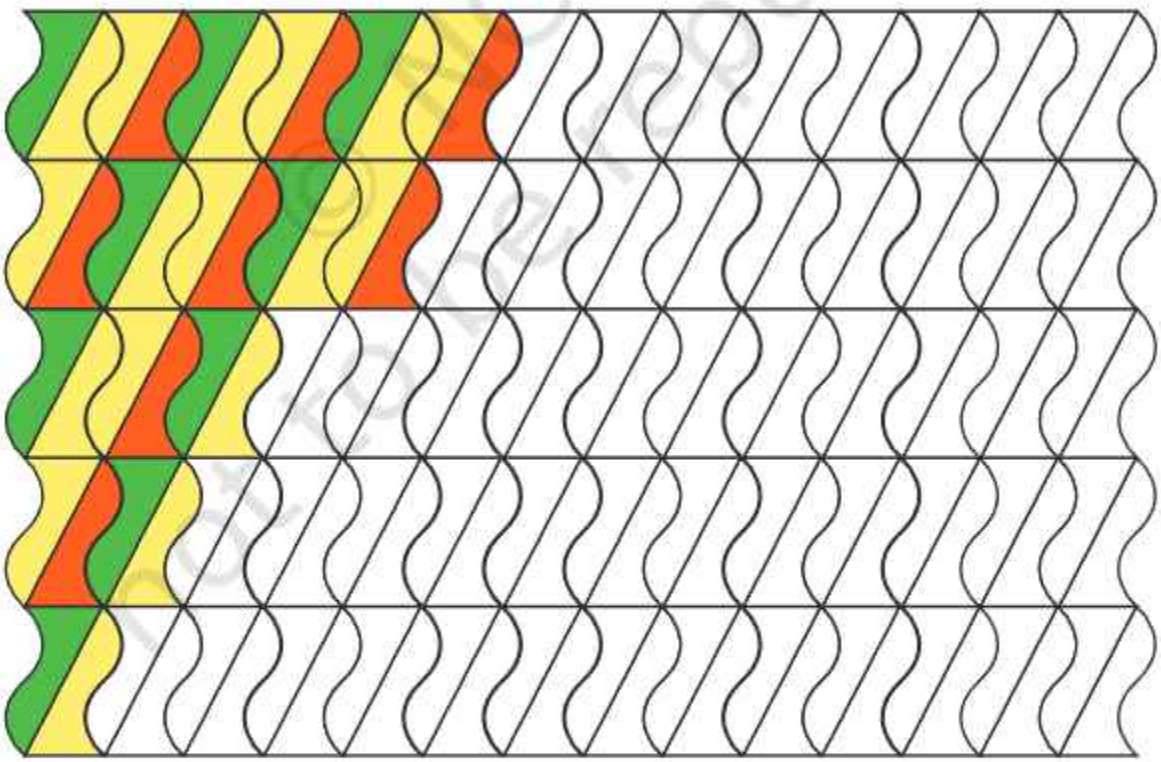
c) Complete this tiling pattern.



d) Ramaiya has made a wall with his blocks. Can you complete this for him?



e) Renu began to paint this wall. Now you help her to complete it.



11 Tables and Shares

Shyama's Garden

Shyama has planted sunflower, rose and marigold plants in her garden. She has planted them in three flower-beds. Her garden looks like this.

Each flower- bed has a different arrangement.

See how the roses are planted.

$18 = 6 \times 3$ So there are 6 rows with 3 plants each.

What are the ways in which the sunflower and marigold are planted?

18 = _____ × _____ So there is ___ row with ___ plants.

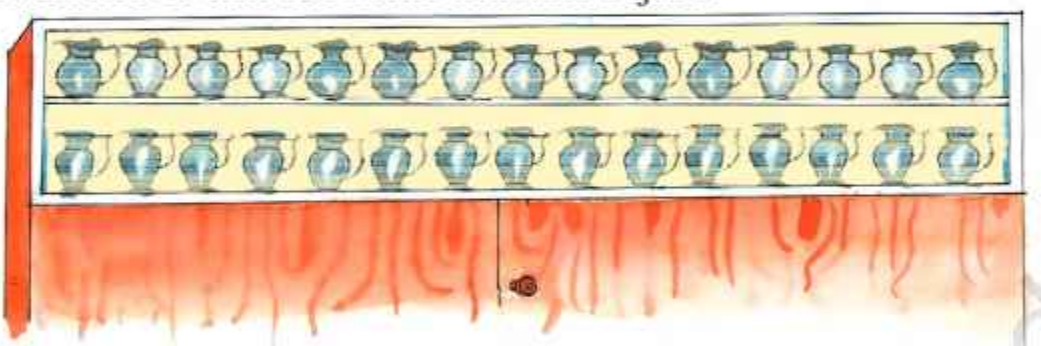
18 = _____ × _____ So there are ___ rows with ___ plants each.

You too can make your own garden. Draw a garden, showing flower-beds with 48 plants. Each row should have the same number of plants.

The concept of multiplication can be related to the arrangement of things in an array. Some other problems, based on contexts like the arrangement of chairs, children in the school assembly, etc., can also be discussed.

Jars in the Shelf

Bheema made a shelf for 30 jars. This is a long shelf with two rows. Each row has the same number of jars.

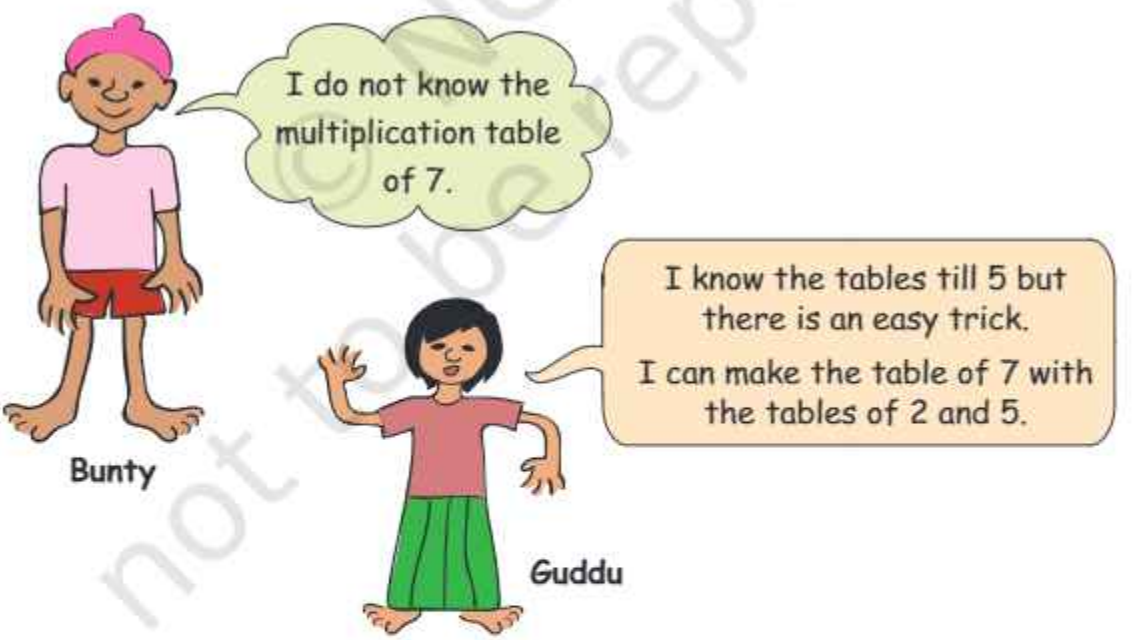


Can you think of other ways to make a shelf to keep 30 jars?

* Draw a shelf. Show how many jars you will keep in each row. How many rows are there?

  Have your friends drawn it in different ways?

Easy Tricks



Children will enjoy building new multiplication tables for themselves instead of only memorising them.

Table of 2

1×2	2×2	3×2	4×2	5×2	6×2	7×2	8×2	9×2	10×2
2	4	6	8	10	12	14	16	18	20

Table of 5

1×5	2×5	3×5	4×5	5×5	6×5	7×5	8×5	9×5	10×5
5	10	15	20	25	30	35	40	45	50

Table of 7

7	14	21	28	35	42	49	56	63	70

Help Bunty to make the table of 7, using tables of 4 and 3.

Table of 4

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

Table of 3

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

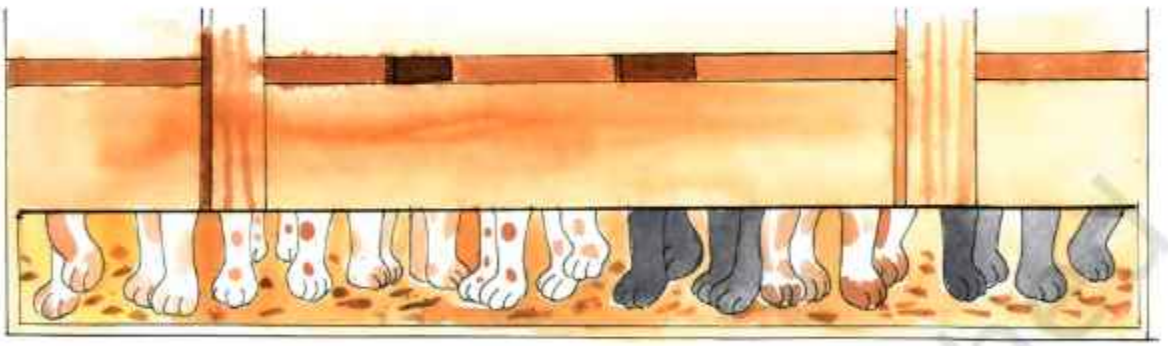
Table of 7

7									

Which two tables will you use for writing the table of 12?

How Many Cats?

Some of Gayatri's cats were playing in a box. When she tried to count, all she could see were legs. She counted 28 legs. How many cats are there in the box?



How many legs?	4	8	12					
How many cats?	1	2						

So 28 legs mean _____ cats.

* Billo has kept his chickens in a box. He counted 28 legs. How many chickens are there?
* Leela has not gone to school for 21 days. For how many weeks was she away from school?

Encourage children to fill in the table and also proceed towards making generalisations. For example, they should be able to see that 48 legs would mean there are 12 cats, or vice versa. In fact, this forms the foundation for algebraic thinking in later years.

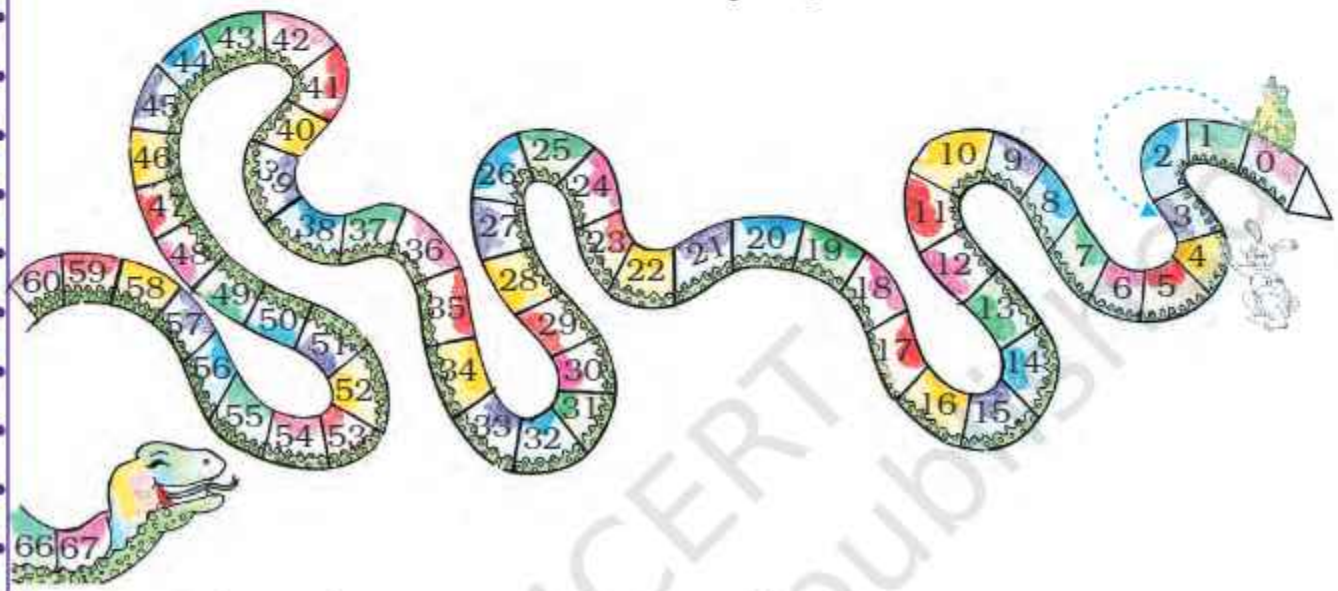
Jumping Animals

Do you remember the jumping animals of Class III?

A **frog** jumps 3 steps at a time starting from 0.

* Count the jumps he takes to reach 27.

So, he has taken 27 ÷ 3 = _____ jumps.



* He has taken _____ jumps, if he is at 36.
* If he is at 42, he has taken _____ jumps.

Starting from 0, a **rabbit** jumps 5 steps at a time.

* In how many jumps does he reach 25? _____
* He reaches _____ after taking 8 jumps.
* He needs _____ jumps to reach 55.

Practice Time

1) 28 ÷ 2 = 2) 56 ÷ 7 =

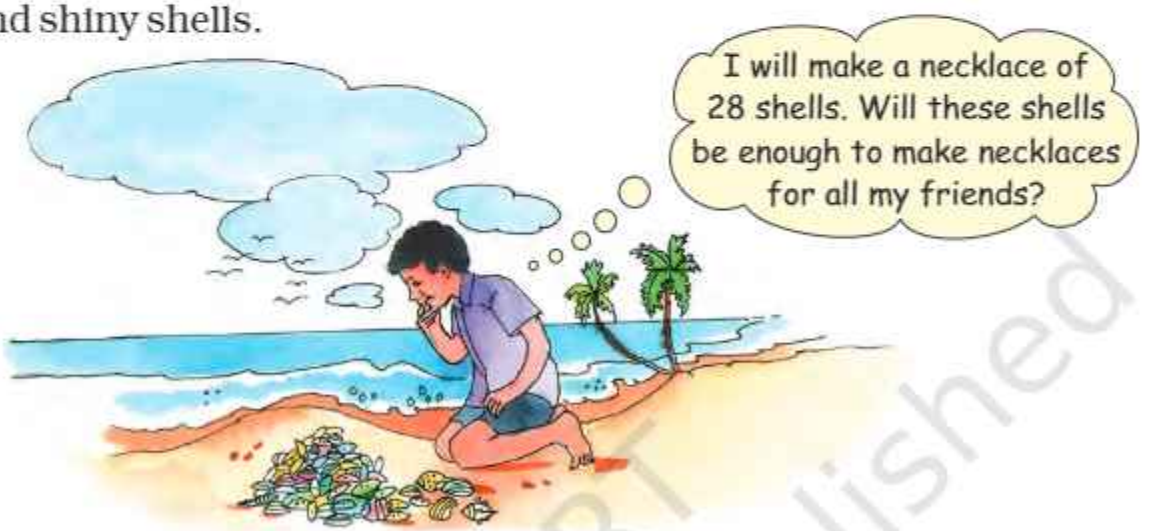
3) 48 ÷ 4 = 4) 66 ÷ 6 =

5) 96 ÷ 8 = 6) 110 ÷ 10 =

Children have done similar kinds of exercises for multiplication and division in Class III. Refer to pages 173-176, Math-Magic Class III, NCERT.

Sea Shells

Dhruv lives near the sea. He thought of making necklaces for his three friends. He looked for sea-shells the whole day. He collected 112 sea-shells by evening. Now he had many different colourful and shiny shells.



He took 28 shells for one necklace.

112 – 28 = 84

Now he was left with 84 shells. Again he took 28 more shells for the second necklace.

* How many shells are left now? _____

Then he took shells for the third necklace.

* So he was left with _____ shells.
* How many necklaces can Dhruv make from 112 shells? _____
* Are the shells enough for making necklaces for all his friends? _____

Try these

A) Kannu made a necklace of 17 sea-shells. How many such necklaces can be made using 100 sea-shells?

Encourage children to solve questions based on division with large numbers, for which they do not know multiplication tables, using repeated subtraction. More problems based on real life contexts can be given.

B) One carton can hold 85 soap bars. Shally wants to pack 338 soap bars. How many cartons does she need for packing all of them?

C) Manpreet wants 1500 sacks of cement for making a house. A truck carries 250 sacks at a time. How many trips will the truck make?

A driver charges Rs 500 for a trip. How much will Manpreet pay the driver for all the trips?

Gangu's Sweets

Gangu is making sweets for Eid. He has made a tray of 80 *laddoos*.

Rabiya

* Are the sweets in the tray enough to pack 23 small boxes? _____

* How many more sweets are needed? _____

For solving this problem, encourage children to use their own strategies — of making groups in the tray, using multiplication to do division or repeated subtraction, etc.

* Gangu also has a bigger box in which he packs 12 *laddoos*. How many boxes does he need for packing 60 *laddoos*?

Practice Time

1) Neelu brought 15 storybooks to her class. Today 45 students are present. How many children will need to share one book?

2) A family of 8 people needs 60 kg wheat for a month. How much wheat does this family need for a week?

3) Razia wants change for ₹ 500.

How many notes will she get if she wants in return —

(a) All 100 rupee notes? _____

(b) All 50 rupee notes? _____

(c) All 20 rupee notes? _____

(d) All 5 rupee notes? _____

* You have to distribute 72 tomatoes equally in 3 baskets. How many tomatoes will there be in each?

* There are 350 bricks in a hand-cart. Binod found the weight of a brick to be 2 kg. What will be the weight of all the bricks?

Children and their Grandfather

Rashi, Seema, Mridul, Rohit and Lokesh asked their grandfather to give them money for the Fair.

I have 70 rupees in my pocket. Tell me how to share money equally among all of you . If you are right, you get this money!

One method

Rashi and Seema thought for a while and said — We know how to do 70 ÷ 5.

Seema starts writing and says —

$$\begin{array}{r|l} & 10 \\ \hline 5 & 70 \\ & -\ 50 \\ \hline & 20 \end{array}$$

→ First I give ₹ 10 to each one of us.

→ So, I have distributed 5 × 10 = 50 rupees.

→ 20 rupees are still left.

Rashi completes it like this. She says —

$$\begin{array}{r|l} & 10 + 4 \\ \hline 5 & 70 \\ & -\ 50 \\ \hline & 20 \\ & -\ 20 \\ \hline & 0 \\ \hline \end{array}$$

I give 4 rupees more to each. So I have distributed 20 rupees. ←

Now nothing is left. And all the money is divided equally. ←

So, each gets 10 + 4 = 14 rupees.

This method is actually about how children divide when they distribute some objects repeatedly. In this case, they might first give ₹ 10 each to five people and then next distribute the remaining money in the second round. They could as well distribute it by first giving Rs 5 to each. Children can, thus, use any way to complete the process of division. This is the beauty of this method.

Another Method

Mridul and Lokesh are trying 70 ÷ 5 in a different way.
Lokesh writes—

First, I give ₹ 5 to each. → 5 + 6

I have distributed 5 × 5 = 25 rupees. → 5) 70 − 25

Next, I give ₹ 6 more to every one.

I have distributed 30 rupees more. → 45 − 30

Now I am left with _____ rupees. → ?

How will Lokesh distribute the rest of the money? Complete it.

So, each child gets 5 + 6 + _____ = _____ rupees.

Check your answer! Multiply your answer by 5 and see if you get 70. Is your answer correct?

Your Method

* Now use your own method to divide ₹ 70 equally among 5 people. If you want you can start by giving ₹ 2 to each. Or you can even start with ₹ 11 to each.

Can you start with ₹ 15 to each?

Try Doing These

a) $5\overline{)65}$ b) $84 \div 2$ c) $3\overline{)69}$ d) $90 \div 6$

e) $4\overline{)72}$ f) $9\overline{)108}$ g) $232 \div 2$ h) $2\overline{)428}$

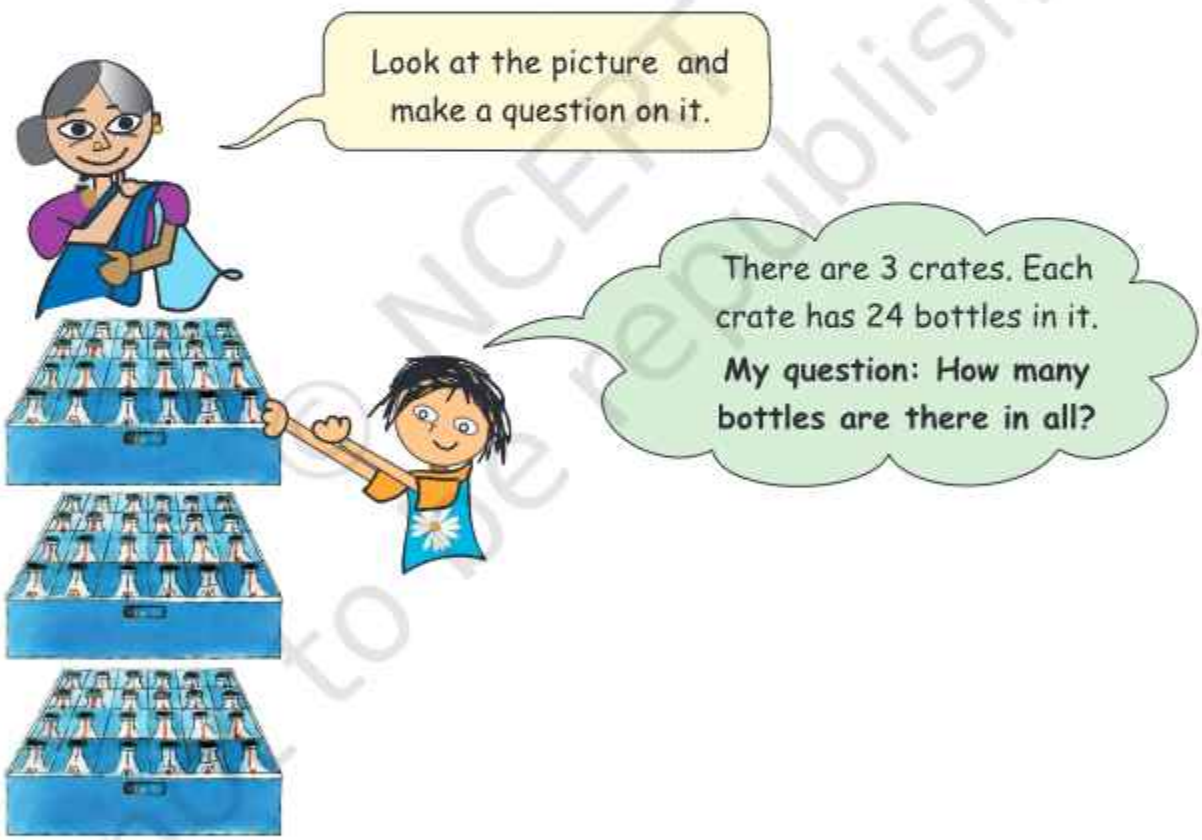
i) Meera made 204 candles to sell in the market. She makes packets of 6. How many packets will she make?

If she packs them in packets of 12, then how many packets will she make?

j) On Sports Day, 161 children are in the school playground. They are standing in 7 equal rows. How many children are there in each row?

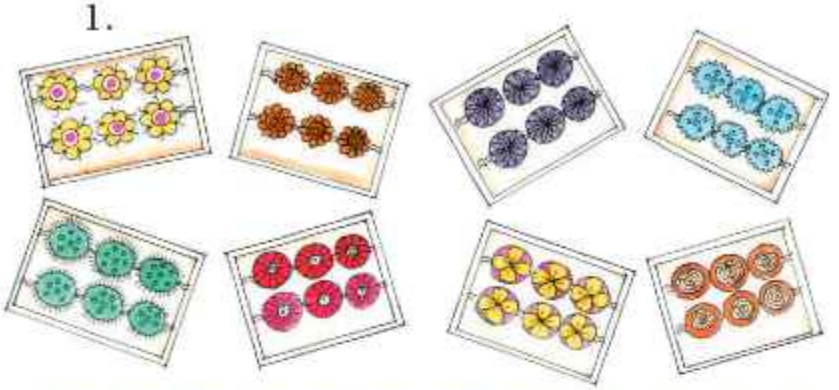
Story Problems

Srishti's grandma is asking her to make problems.



Now you look at the other pictures and make questions like Srishti.

1.



There are 8 packets of *rakhis*.

Each packet has 6 *rakhis* in it.

Your question:

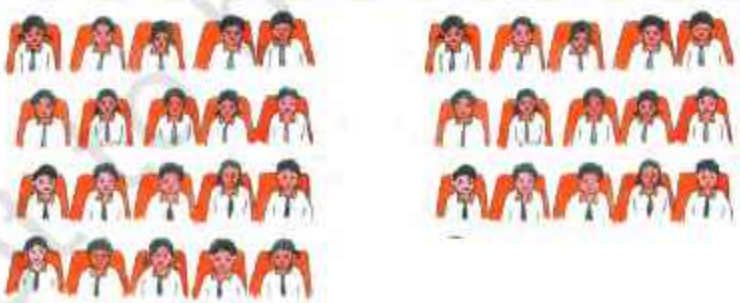
2.

There are 10 packets of sugar.

Saurabh paid 110 rupees for all the packets.

Your question:

3.



There are 35 students in 7 rows. Each row has the same number of students.

Your question:

4. Hari, Seema, Chinku and Lakshmi are going to Guwahati.

The cost of one rail ticket is ₹ 62.

Your question:

5. One metre of cloth costs ₹ 20. Lalbiak bought some cloth and paid ₹ 140.

Your question:

Your question:

Also guess the answers.

12 How Heavy? How Light?

Jaiju and Mannu were shifting house. They loaded all their things on a horse-cart. There were many things like — a water tank, five sacks of wheat, three tables, an almirah, four chairs, two mattresses, three sacks of rice, a bamboo ladder, pots and pans.

When they were ready to move, the horse refused to start. They wondered why. Their father said that this horse was not well and would not pull a load heavier than 700 kg. Oh! But how heavy is this load? — they asked.

Father gave them some idea of the weight of each thing.

* Find out the total weight they had loaded on the cart.

Now they decided to remove a few things from the cart.

* Which things should be removed so that the weight of the load is not more than 700 kgs?

Thing loaded	*Weight*
A sack of wheat	100 kg
A sack of rice	35 kg
Water tank	50 kg
Almirah	70 kg
A table	10 kg
A chair	5 kg
A mattress	20 kg
Bamboo ladder	10 kg
Pots and pans	10 kg

_____

_____

The things which were loaded on the cart were big in size and also very heavy. To measure the weight of such heavy and big things, we need a big balance.

But Jaiju and Mannu wanted to make their own balance. They collected a few things — a stick, two lids and a thick thread. They made this balance.

* Now you also make your own balance. Write down how you made it. Also draw a picture of your balance in the box below.

Activity

Mannu and Jaiju put a pencil and a geometry box in the two pans of the balance. Which pan will go down? Why? Draw a picture to show it.

What is heavier?

* Make pairs of different things and use the balance to decide which is heavier. First guess which thing will take the pan down and then check with your balance.

What is the heaviest?

* Make groups of three things. For example — eraser, ball and paper. Use the balance to arrange them in order of weight – the lightest, the one with in-between weight, the heaviest. Complete the table with at least five examples.

Lightest	*In-between weight*	*Heaviest*
Paper	Eraser	Ball

* Can you find your own weight using this balance?

The balance children make will not be very accurate but will be good enough to compare weights which are different from each other.

Making Weights

Do this activity in pairs. You need a balance, weights, a cake of soap, plastic packets, sand and rubber bands. You can also take help of an older person.

Get a new cake of soap. The packet will have the weight written on it. You can use this soap to make your own different weights.

The soap weighs _____ grams (g).

Take a small plastic packet.

Put it in one pan of the balance. Put the soap in the other pan.

Slowly add sand to the packet till the pans are balanced.

Close the packet with a rubber band or string. Now stick a strip of paper and write '____ g' on it.

If you put the soap and the weight you just made together in a pan, how many grams will both these weigh? _____

Now make different weights — 150 g, 200 g and 250 g. You can use soaps of different weights for this.

Also make some bigger weights of 500 g, 1000 g, and 750 g.

* Use your weights to weigh different things and write in your notebook.

Practice Time

* Which pan of the balance will go down? Show by drawing an arrow.

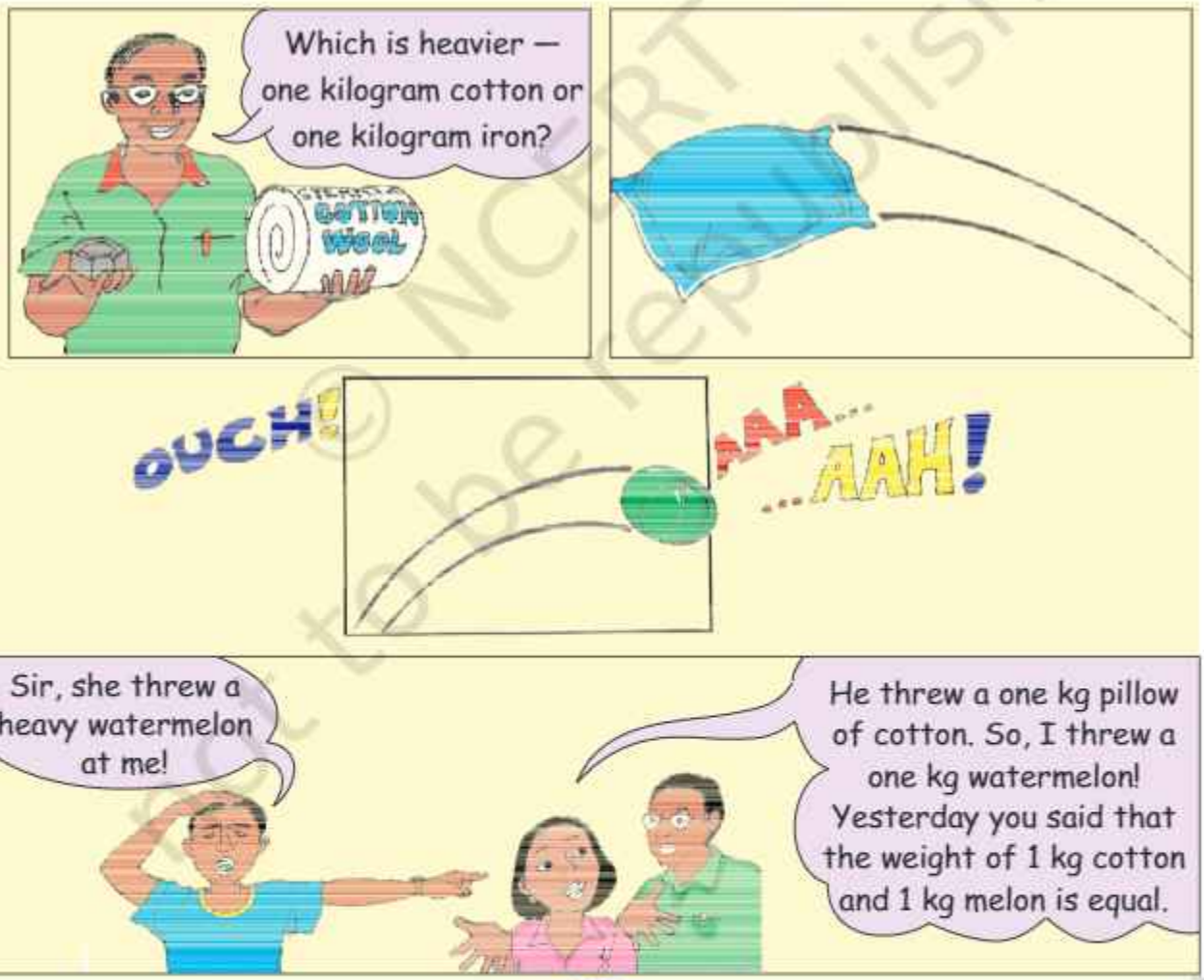
* Is the weight on any of the pans equal to 1 kilogram? Mark it.
* How many grams are there in 1 kg?

Grams and Kilograms

Name 5 things that we usually buy —

In grams	In kilograms
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Which is Heavier?



Dinesan Went Shopping

Dinesan went to a shop and bought some things.

His younger brother cut the end of the bill where the weights were written.

* Guess and write the weight of each thing he bought – in g or kg.

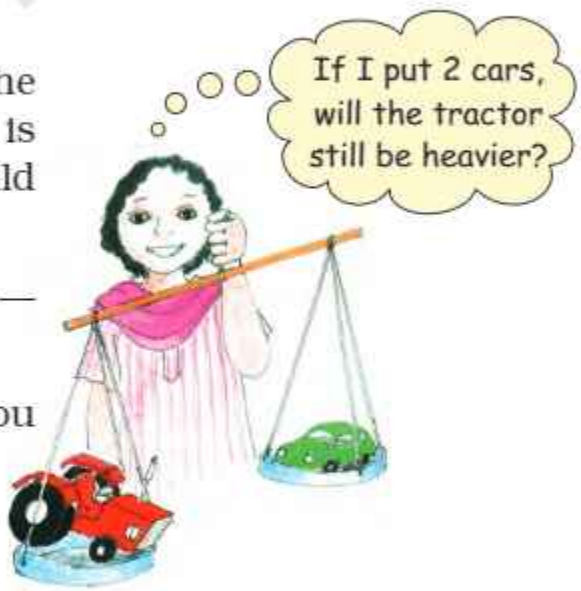
Items	*Weight*	
Rice	5	
Sugar	1	
Mustard seeds	10	
Wheat	3	
Dal	500	
Tea	250	
Pepper	25	

Car and Tractor

Ritu is weighing her toys. She wants to know if her tractor is heavier than her car. How would you help her to find out quickly?

Guess which is the heaviest — a real car, a bus or a tractor?

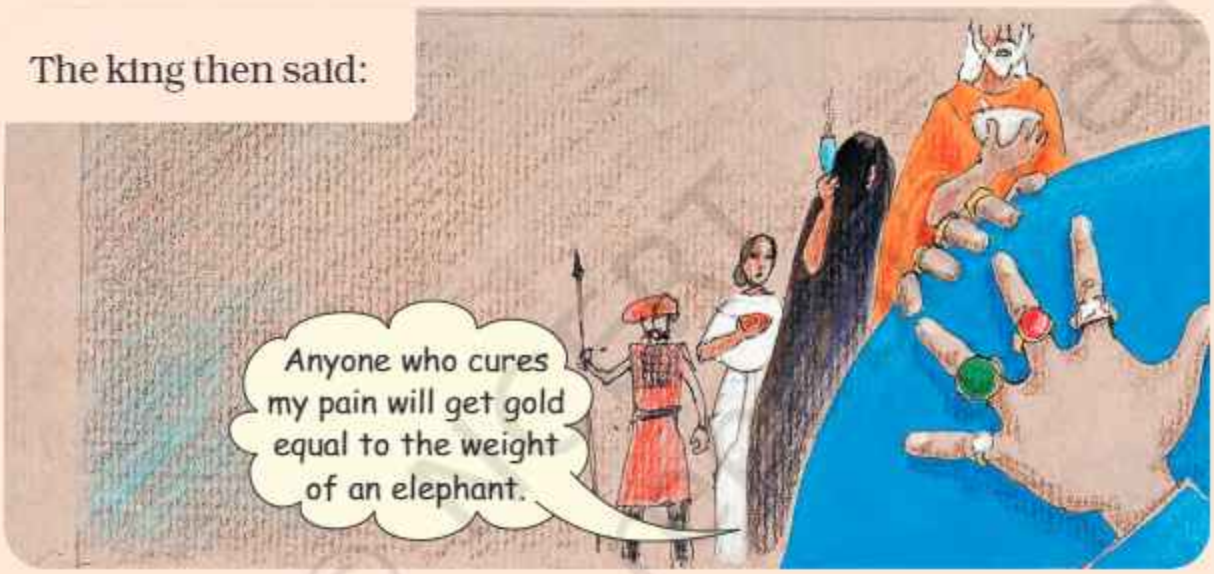
Which is the heaviest thing you have seen?



Elephant's Weight

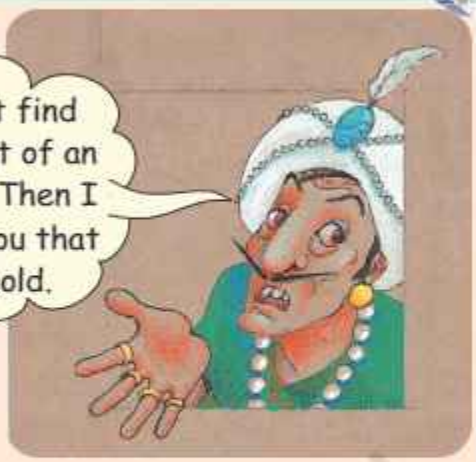
Once a king had pain in his stomach. None of the palace doctors could cure his pain.

The king then said:



On hearing this, doctors from all over the country came. But only Dr. Vaidika could cure him.

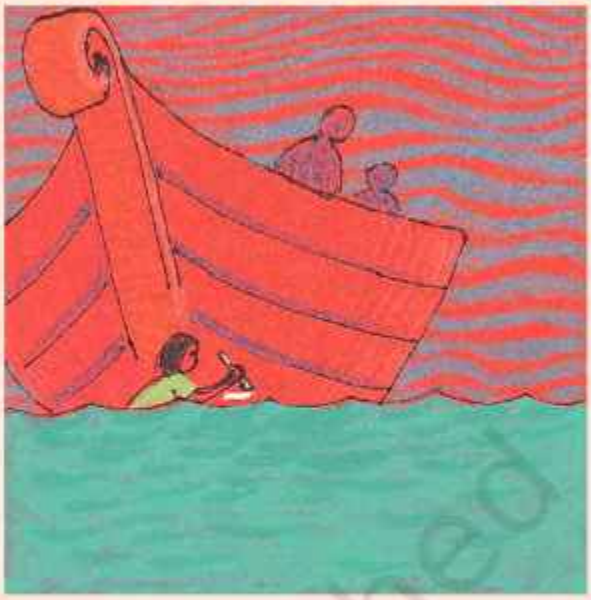
But, the greedy king didn't want to give her the gold. So, he thought of a trick.



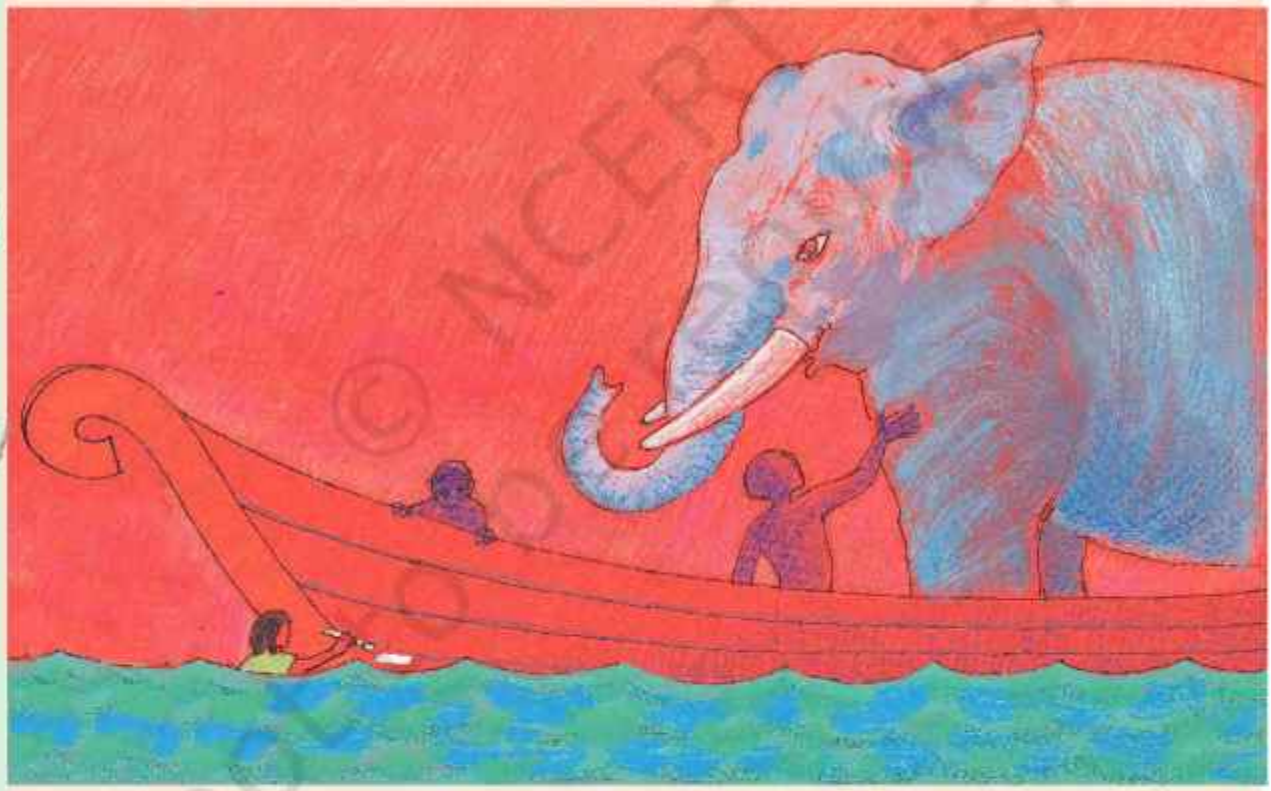
Vaidika was unhappy when she reached home. She told her daughter the whole story.

Next morning, Dr. Vaidika invited the king near a river. The king came with an elephant and a big boat.

Vaidika's daughter went into the river. She marked on the boat how much it sank in the river.



Then she asked them to bring the elephant into the boat. The boat sank deeper. So she marked the new water level on the boat.



Now imagine what happened next and complete the story. Discuss with your friends how Vaidika's daughter found the weight of the elephant.

How Much the Chair Weighs

Anamika wants to weigh this chair using the weighing machine.

Can you suggest a way for doing this?

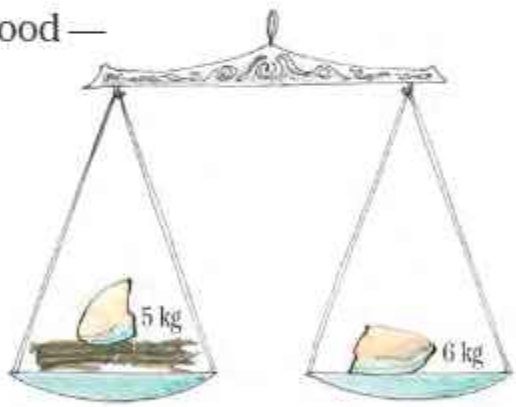
Broken Stones

Abdu sells firewood. There was a stone in his shop which weighed 13 kg. He used it to weigh firewood.

One day the stone fell down and broke into three pieces which weighed – 2 kg, 5 kg and 6 kg.

But Abdu was very smart. He used those three pieces to weigh firewood of all weights — from 1 kg to 9 kg.

Here is how Abdu weighed 1 kg of firewood —



✤ Now you show how Abdu will use these stone pieces to weigh —

a) 4 kg of firewood

b) 3 kg of firewood

c) 7 kg of firewood

Post Office

Have you ever been to a post office? _____

What different things do people go there for?

How much does a postcard cost? _____

How much does an inland letter cost? _____

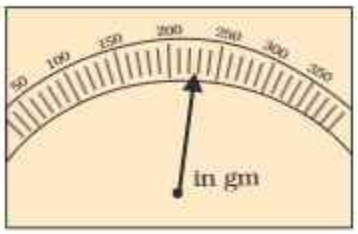
Postal Rates

Postal Items	*Postal Rates (in ₹)*
Single post card	0.50
Printed post card	6.00
Inland Letter	2.50
Letter weighing –	
i) 20 grams or less	5.00
ii) For every additional 20 grams	2.00
Parcel weighing –	
i) 50 grams or less	5.00
ii) For every additional 50 grams	3.00

Look at the postal rates given in the chart.

1. How much will you have to pay for stamps on a letter weighing 50 grams? _____
2. Akash wants to send a parcel of the Math Magic textbook to his friend Rani in Chennai. The book weighs 200 g. See the chart to find the cost of posting the book. _____

3. Read the weight shown in the picture. Find out the cost of sending a parcel of that weight.



Parcel weight = _____

Cost of stamps = _____

How Many Stamps?

Rahul needs stamps of Rupees 25 for his parcel. He went to the post office. Only stamps of ₹ 1, ₹ 2, ₹ 5 and ₹ 10 were there at that time. Using those stamps in how many different ways can he make ₹ 25?

Can you show five different ways? What is the heaviest parcel he can send using stamps of ₹ 25?

Our Weight Together

A frog was struggling to escape from the mouth of a crow. How can I escape? — the frog thought. Suddenly a trick came to his mind. He asked the crow — Are you good at arithmetic? If yes, then I will ask you a problem.

Your weight is 650 g and I am only 145 g. How much do we weigh together?

The crow was good at mathematics, so he happily opened his beak to answer.

What happened after that? So what was the answer the crow wanted to give? _____

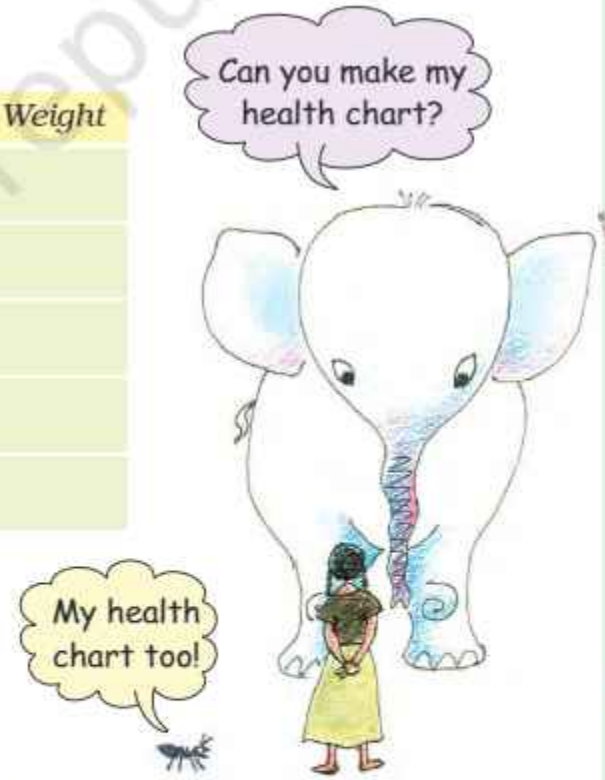
Am I Fit or Fat?

The chart shows the height and weight of children between 6 and 10 years old.

Name	*Age*	*Height*	*Weight*
Temshula	6	3 feet, 7 inches	16 kg
Sreekunth	10	4 feet, 3 inches	23 kg
Rabiya	6	3 feet, 10 inches	17 kg
Vineet	8	3 feet, 11 inches	19.5 kg
Kavita	9	3 feet, 10 inches	20 kg

Now, you also fill the table by finding out the age, height and weight of any five friends.

Name	*Age*	*Height*	*Weight*

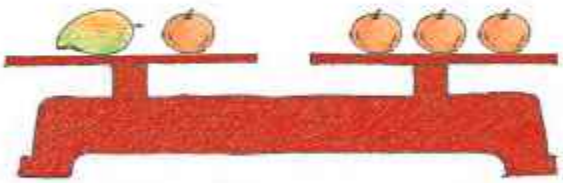


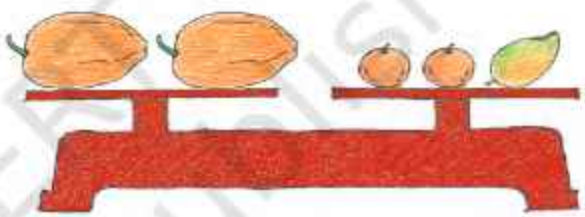
Puzzle

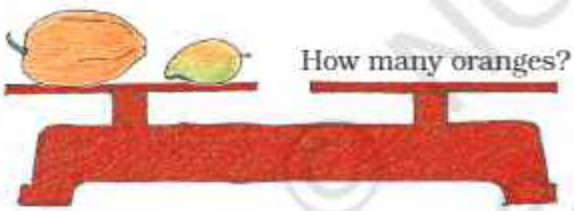
How Many Oranges?

All oranges have equal weight. The two papayas have the same weight. The weights in the first and second balances are equal.

How many oranges balance the weight in the third?







How many oranges?

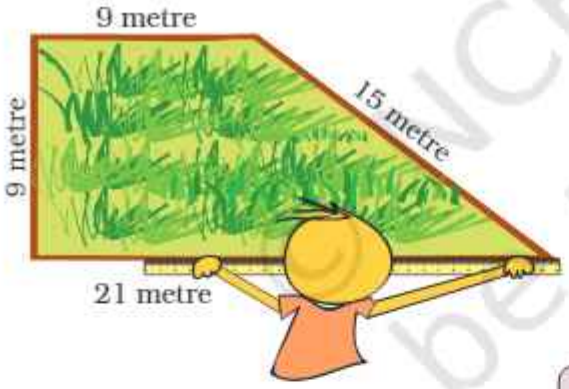
Find That Marble

There are 3 marbles of the same size but one marble is slightly heavier or lighter than the other two. Can you find which is that marble and if it is heavier or lighter? You can use a balance only two times.

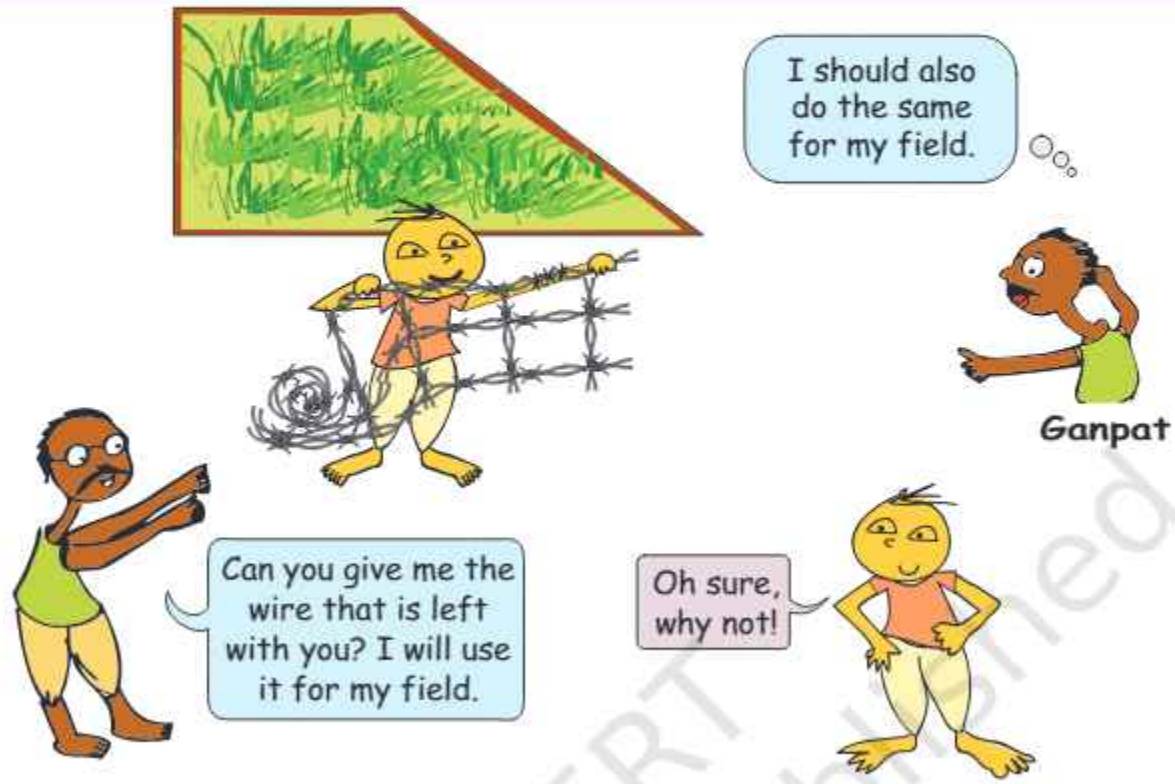
13 Fields and Fences

Rahmat is a farmer. He grows wheat in his field.

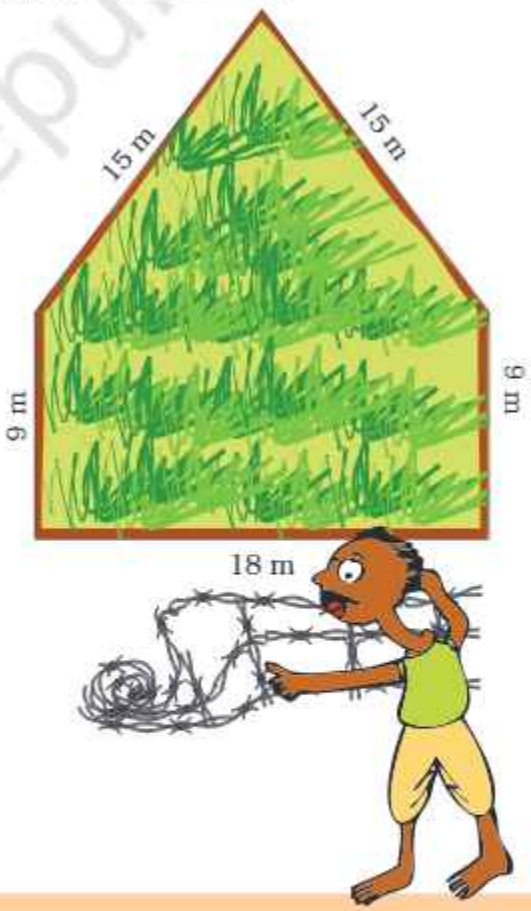
Rahmat needs to find the length of the boundary of the field. Can you find it from this picture? See the length of each side written near it.



Rahmat bought a roll of 70 m wire for the fence.



How much wire did Rahmat give to Ganpat? _____



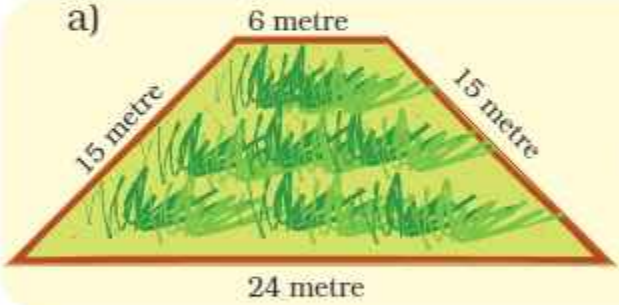
Ganpat thanked Rahmat and started fencing his own field. But he needed to get more wire.

* How long is the boundary of Ganpat's field? _____
* How much more wire will Ganpat need for his field? _____

Practice Time

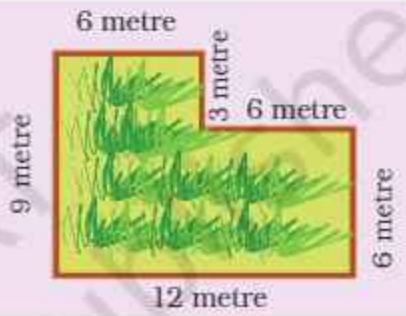
1. Here are pictures of some more fields. Find out which one has the longest boundary.

a)



Boundary = _____ metre

b)

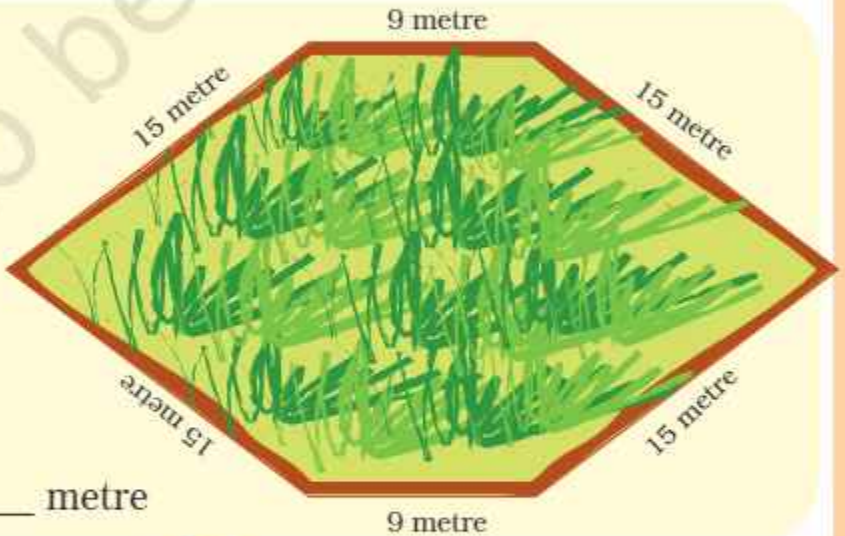


Boundary = _____ metre

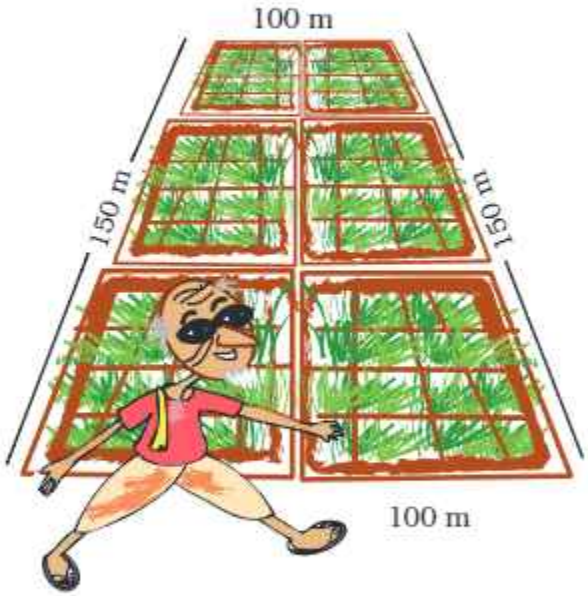
c)

Boundary = _____ metre

d)



Boundary = _____ metre



2. Chandu's father is called the 'young old man' in his village. At 70 years of age, he is fully fit. Do you know his secret? He goes for a walk around the field every morning. Everyday he takes four rounds of Chandu's field.

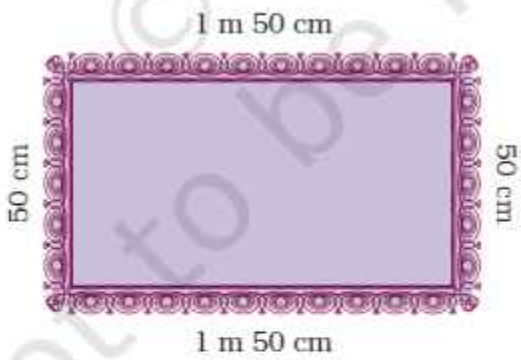
* What is the total distance he covers?

4 × _____ = _____ m = _____ km

3. Ganpat's wife works in a tailor's shop. She has to fix lace around a table cloth.

She bought a 100 metre roll of lace.

* Look at the picture of the table cloth and tell how much lace is used for one table cloth. _____

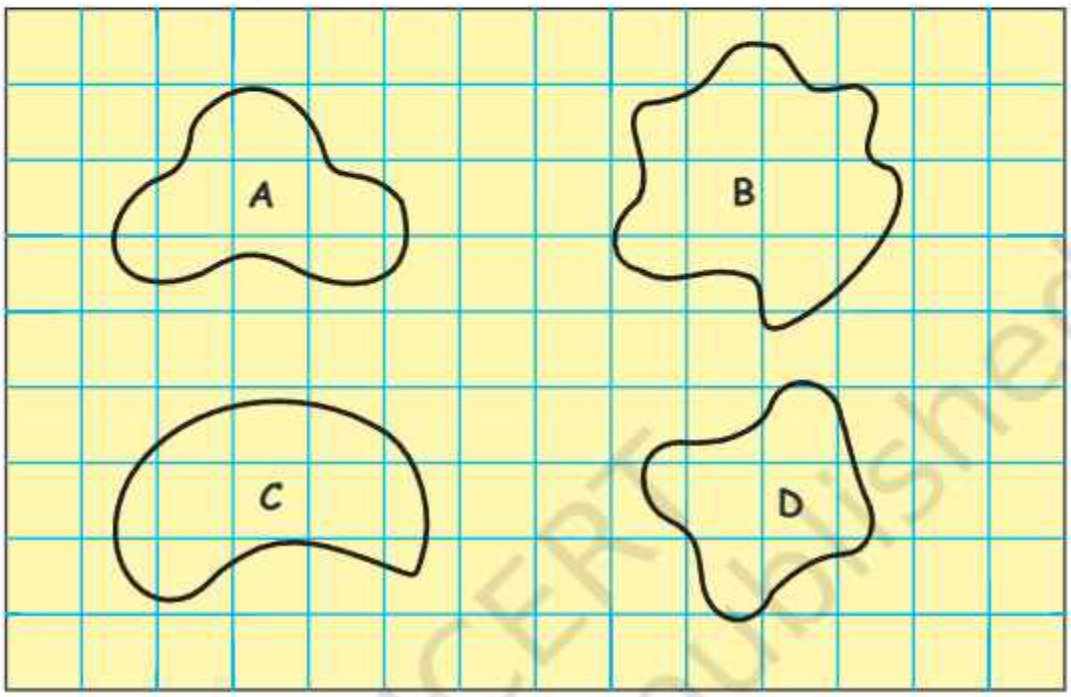


* How much lace will be used in 3 such table cloths? _____

* How much lace will be left in the roll? _____

Activity

1. Find out the length of the boundary of these shapes. (Hint :– You can use a thread)



Now count the squares to find out :

* How many squares are there in each shape?
* Which shape covers the least number of squares?
* Which shape covers the most number of squares?

2. Take a 20 centimetre long thread. Make different shapes by joining the ends. Place on the squared sheet on the next page. Find out:

* How many squares are there in each shape?
* Which is the biggest shape?
* Which is the smallest shape?
* How long is the boundary of each shape?

Children could be asked to ignore a square if it is less than half, but count it as 1 if is more than half. This will give them a feel for 'rounding off'.

3. How many different shapes can you make by joining two squares? Draw them on the squared sheet given below. How long is the boundary of each shape?

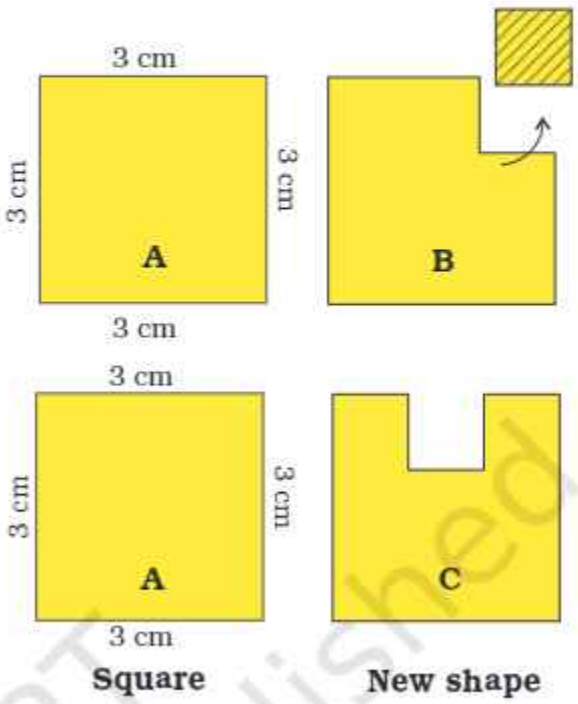
Try this activity with three squares also.

Practice Time

1. A square has a boundary of 12 cm.

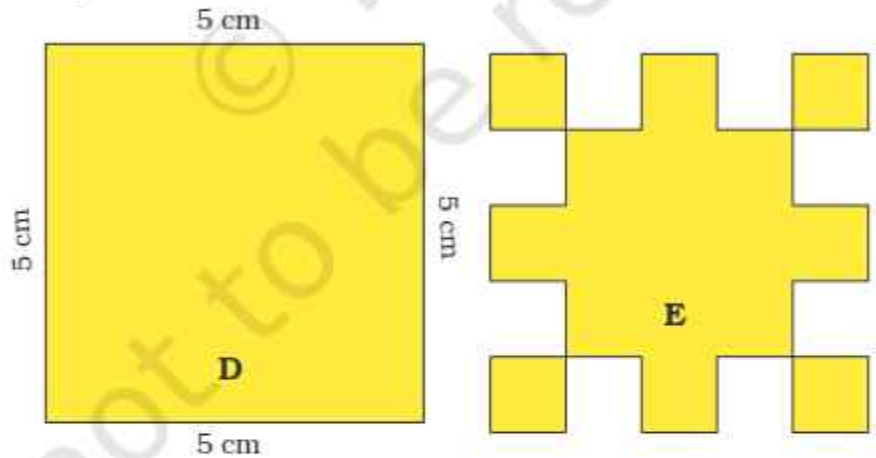
a) From the corner of this square, a small square of side 1 cm is cut off. Will the boundary of B be less or more? Find its length.

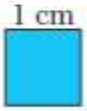
b) If you cut a 1 cm square to get shape C, what will be the length of the boundary of C?



2. a) Find the length of the boundary of square D.

b) 8 squares of side 1 cm are cut out of the square D. Now it looks like shape E. What is the length of the boundary of shape E ?



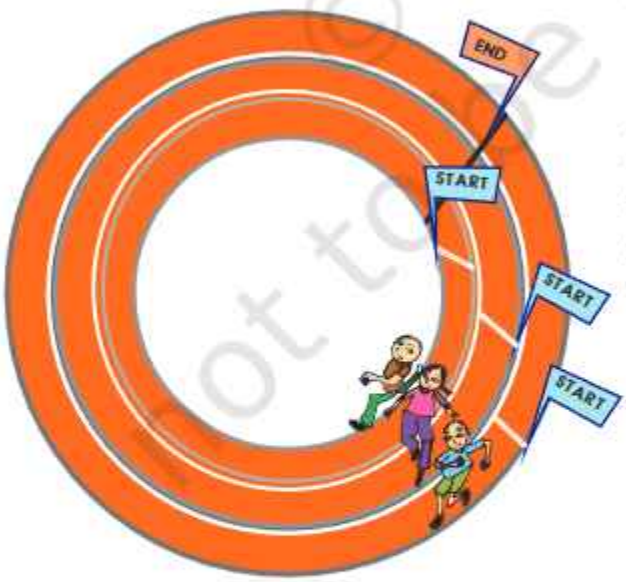
c) The boundary of this  is ____ + ____ + ____ + ____

Can we also say that the boundary is 4 × 1 cm?

3. A hockey field is 91 metres 40 cm long and 55 metres wide. How long is the boundary of the field?

4. Usha and Valsamma are running a race. Usha is running on the inner circle. Valsamma is running on the outer circle.

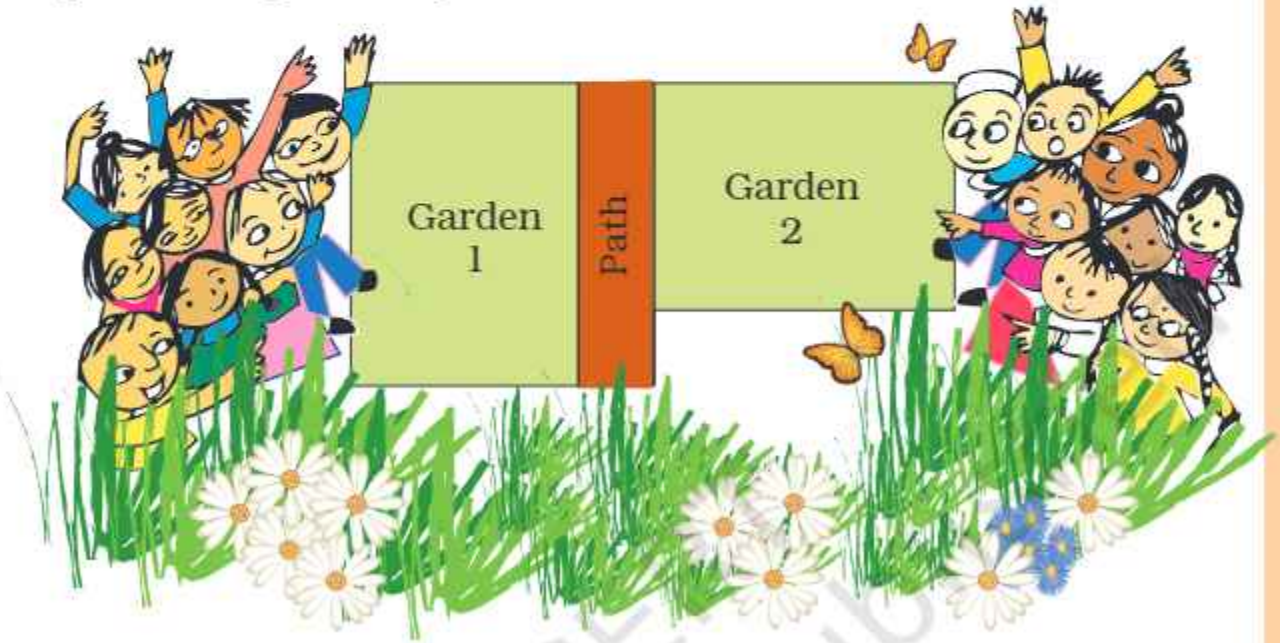
Valsamma runs faster than Usha. But still she loses the race. Can you guess why? _____



Have you seen any race where runners start from different places — like in this picture? Guess why?

School Garden

The students of Class III and IV thought of making a vegetable garden. They chose a place which looked like this.



Students of both the classes thought that garden 1 was bigger. So both wanted to take garden 1. Suddenly Neetu said –

* How will Neetu find out if the two gardens are equally big?

Activity

1. Look at the table in your classroom. Guess how many Math-Magic books you can place on it.

   (Remember — The books should not overlap. Do not leave gaps between the books.)

   Write your guess here. _____

   Now check if your guess was right. How many books could you place?

   _____

   What is the difference between your guess and the actual number of books? _____

2. Now look for another table.

   a) Is this table bigger than the last table? Yes/No

   b) Make a guess how many Math-Magic books can be kept on this table. _____

   c) Check if your guess was correct.

   How many Math-Magic books could you keep? _____

   d) The difference between the sizes of the two tables is _____ books.

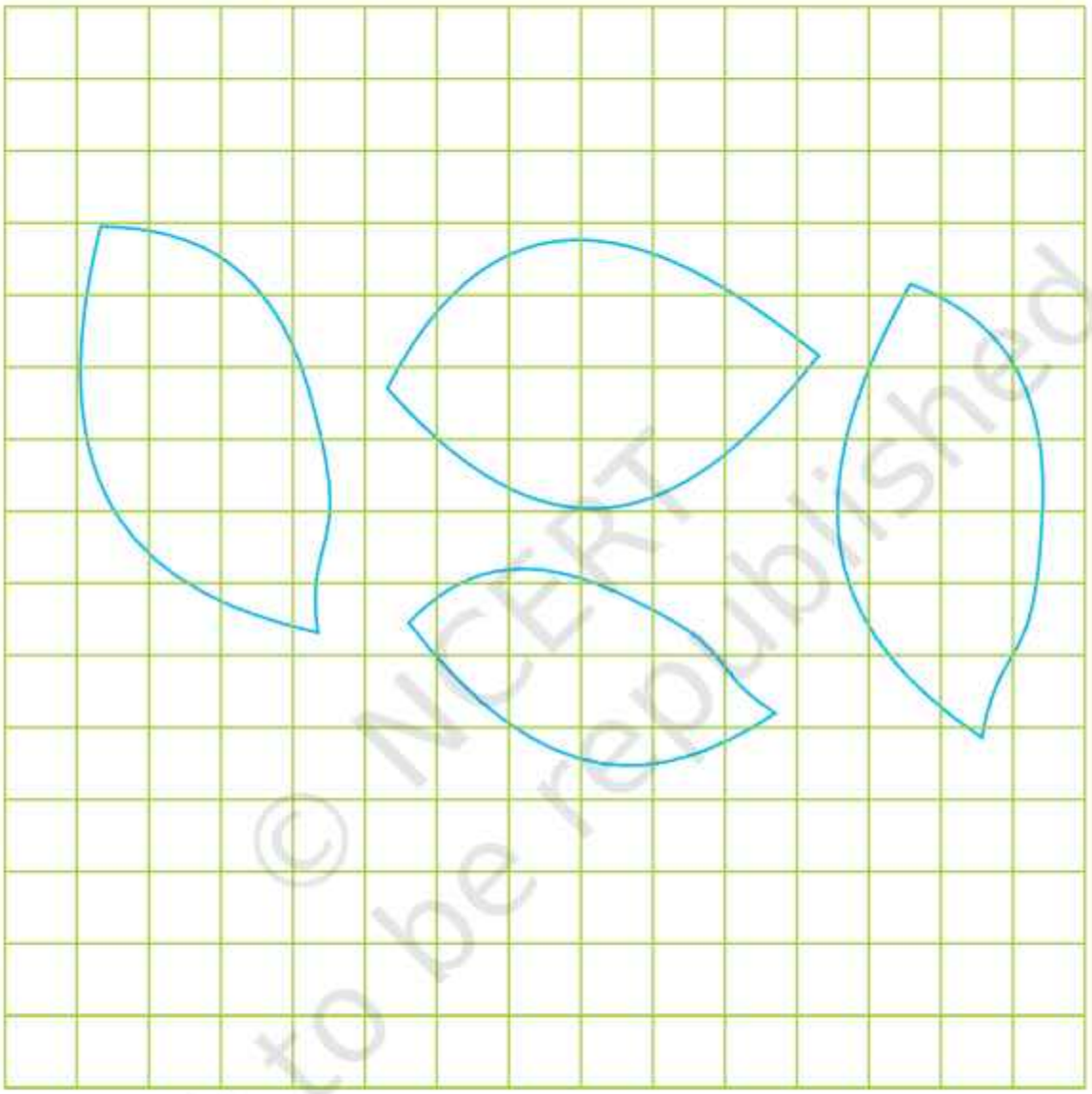
3. a) How many Math-Magic books can be covered with one sheet of newspaper?

   b) Try covering your Math-Magic book with half a sheet of newspaper.

   c) Can you cover your book with a smaller sheet?

d) Find the smallest sheet which can cover your book. Check if your friend used a smaller sheet than you did.

4. a) Which is the biggest leaf in this picture?



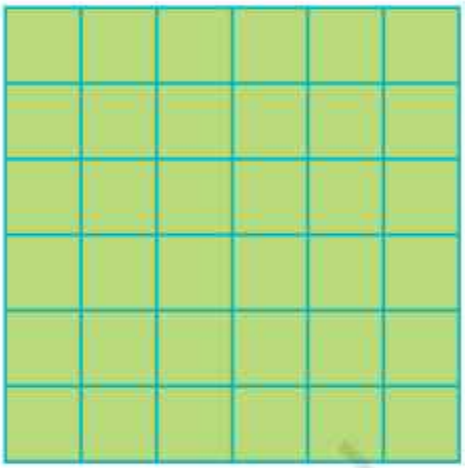
b) Collect some leaves from the garden. Place each of them here on this squared sheet. Trace out their edges and check how many squares there are in each leaf.

c) Which is the biggest leaf?

d) Which is the smallest leaf?

5. a) How many small squares of size 1 cm are there in this big green square?

b) Can you think of a faster way to know the total number of small squares without counting each ?

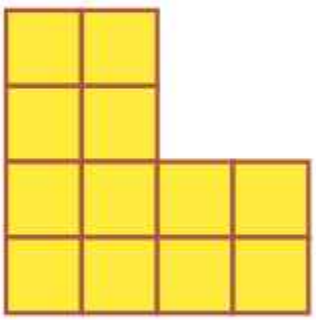


6. Guess how many squares of one centimetre can fill this blue rectangle.

Write your guess here. _____

Check your guess by filling it with small squares.

7. Look at the picture. Can you divide it into 4 equal pieces? Each piece should have the same number of squares.



Puzzle: A House and the Well

Raghavan has a piece of land.

There are 4 houses on his land and in the middle there is a well. He wants to divide this land equally among his four children. Each should get one house and be able to use the well without entering the other's land. Can you help him divide the land?

Give different colours to each one's share.

14 Smart Charts

How Many Hours?

All of us enjoy watching television (TV) or listening to the radio.

How much time do we spend in this?

- Note the time you spend in front of a TV or radio every day. Do this for one week. The time spent in a week is _____ hours.

So in a month you spend about 30 × ___ = _____ hours.

- Find out from your friends the time they spend in a week.

How many hours they watch TV or listen to the radio (in a week)	*Number of children*
More than 6 hours	
Six hours	
Five hours	
Four hours	
Three hours	
Two hours	
One hour	
Zero hour (do not watch)	

From your table

Watching TV/listening to the radio...

- _____ children spend more than 6 hours in a week.
- _____ children spend no time at all.
- Most children spend _____ hours in a week.
- _____ children spend more than 3 hours.

Which Programme?

There are different types of programmes on TV or radio such as cartoons, news, sports, music, plays, serials. Juhi's father likes watching serials. Her mother likes sports. Juhi likes news programmes.

(1) Ask people in your family to name one programme they like and one programme they dislike. Make a table.

Family member	*Programme they like*	*Programme they dislike*
Mother		
Father		

The kind of programme most family members like _____

The kind of programme most family members dislike _____

2) Find out from 20 friends the programmes they like and dislike, and write in a table.

Kind of programme	*Number of children liking it*	*Number of children disliking it*
News		
Serials		
Cartoons		
Comedy shows		
Sports		

- Which kind of programme is liked by most children?
- Which kind of programme is disliked by the least number of children?
- How many children like sports programmes?
- Is there any kind of programme not liked by any one? Yes/No If yes, which one? _____.

Who is my friend?

I've a friend with me always,
In the nights and through the days.
When I run he runs with me,
Sometimes I lead, sometimes he.
When it's dark he can't be seen,
Do you know which friend I mean?

❖ Read the poem carefully and answer these questions:

a) Which word comes most often in the poem?

b) Which letter has been used most?

c) Which letter comes the least?

❖ Take a paragraph you like from your language textbook. Read carefully and find out:

a) Which word comes most often? _____

How many times? _____

b) Which word comes least often? _____

c) The letter used most often is _____

d) The letter used least often is _____

Food We Eat

Children were talking about what things they eat in the morning — made of rice, wheat, maize, barley, etc.

Find out from your classmates and fill the table:

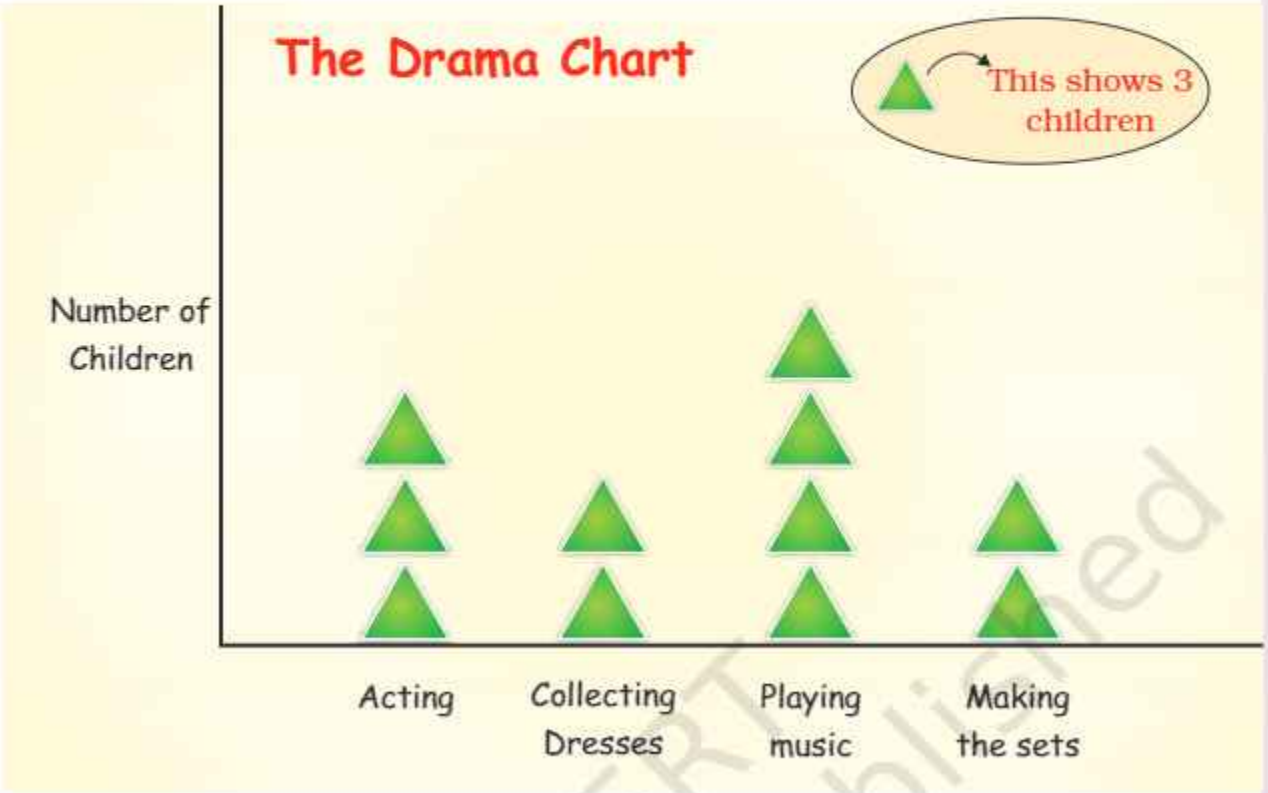
Main food	*Number of persons*
Rice	
Wheat	

Look at the table and tell:

- Most children eat food made from _____.
- Compared to children who eat rice, those who eat wheat are more/less/equal.
- Compared to those who eat wheat, children eating *ragi* are more/less.

Preparing for the Class Drama

All children of a class are getting ready for a drama. Some children are acting. Some are busy collecting the dresses. Some are bringing tables and chairs to make the sets.



a) How many children are acting in the drama?

b) Which are more — children making the sets or those acting?

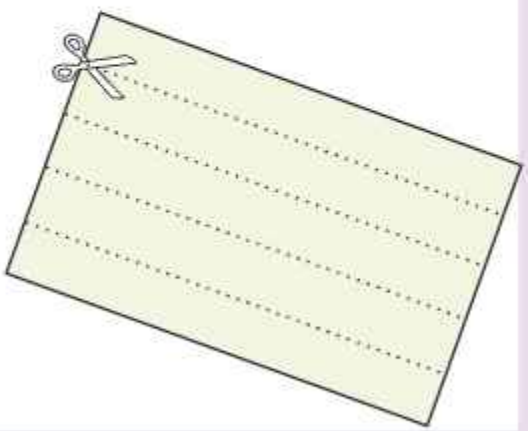
c) What is being done by most of the children?

d) How many children are collecting dresses?

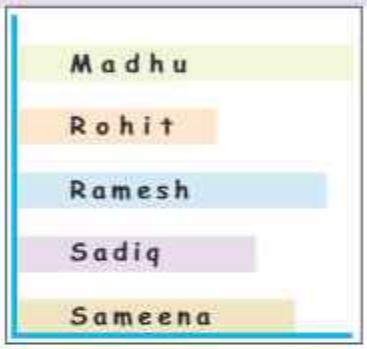
Whose Head is Bigger?

Cut long paper strips from waste paper.

Give one strip to each of your friends. Now put the paper strip around your head and tear off the extra strip. On a big sheet, paste these paper strips along a line.



Some children had pasted their strips and made a chart like this.



Your chart should also look like this.

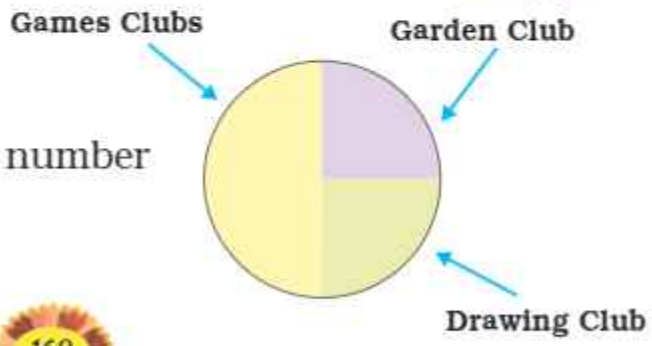
❖ Use a scale and find out from your chart:

The length of the longest strip is _____ cm.
So _____ has the biggest head.

The smallest strip is _____ cm long. It belongs to _____.

Chapati Chart

All children of a school take part in different clubs:



The *Chapati* Chart shows the number of children in different clubs.

From the picture we can see that:

a) Half the children in the class take part in the Games Club.

b) One fourth of the children are members of the Garden Club.

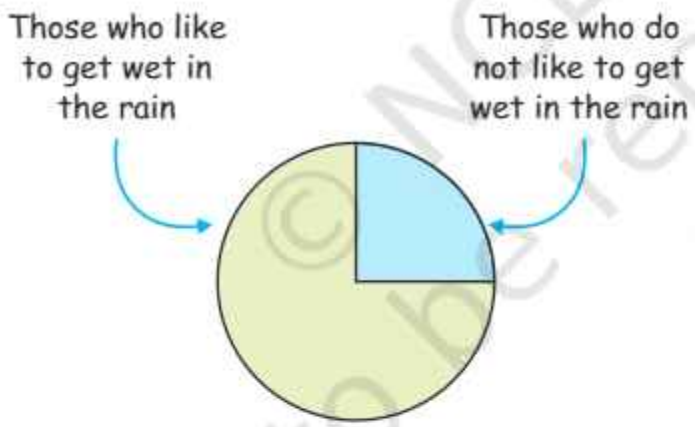
c) The Drawing Club has one fourth of the children of the class.

If there are 200 students in the school, look at the above *Chapatt* Chart and tell the number of members in each club:

- The Games Club has _____ members.
- The Garden Club has _____ members.
- There are _____ members in the Drawing Club.

Getting Wet in the Rain

Who likes to get wet in the rain? A child made this *Chapatt* Chart after asking his friends.



See the *Chapatt* Chart and tell:

1) How many children like to get wet in the rain?

   a) half b) one-fourth c) three-fourth

2) How many children do not like to get wet in the rain?

   a) half b) one-fourth c) three-fourth

If the number of children in the class is 28, then tell the number of children

- who like to get wet in the rain _____
- who do not like to get wet in the rain _____

Tea, Coffee or Milk

Some children were asked which of these they liked most — Tea, Coffee or Milk.

The drink they like	*Number of children*
Milk	20
Coffee	10
Tea	10
Total Number of children	_____

Find out from the table:

- Children who like milk are $\frac{1}{2}$ / $\frac{1}{4}$ of the total children.
- Children who like coffee are $\frac{1}{2}$ / $\frac{1}{4}$ of the total children.

Show the liking for Tea, Coffee or Milk in a *Chapati* Chart.