4 Parts and Wholes

Our Flag

You must have seen the flag of our country. Do you know how to draw the flag?



Draw a rectangle of length 9 cm and width 6 cm. Divide it into three equal parts and complete the flag.

The top one-third of our flag is saffron (or orange). What is the colour of the middle one-third of the flag? Where will you draw the Ashoka chakra?

How much of the flag will you colour green?

Is the white colour now less than $\frac{1}{3}$ of the flag? Why?

Now look at this flag. How much of it is black? _____

The green part of the flag can be written as _____

Is red less than one-third of the flag? Why?

The flag of Afghanistan





This is the flag of Myanmar, our neighbour.

Is blue more than one-fourth of the flag or less ?

Guess how much of the flag is red. Is it more than $\frac{1}{2}$? Is it more than three-fourths?

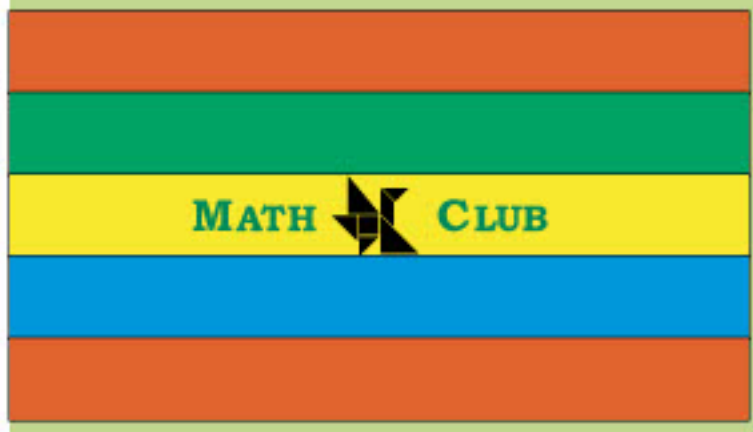
Because of the blue chakra in the white part of the Indian flag, the white colour is a little less than 1/3.There can be some discussion on this point.

Find out

Collect as many flags as you can.

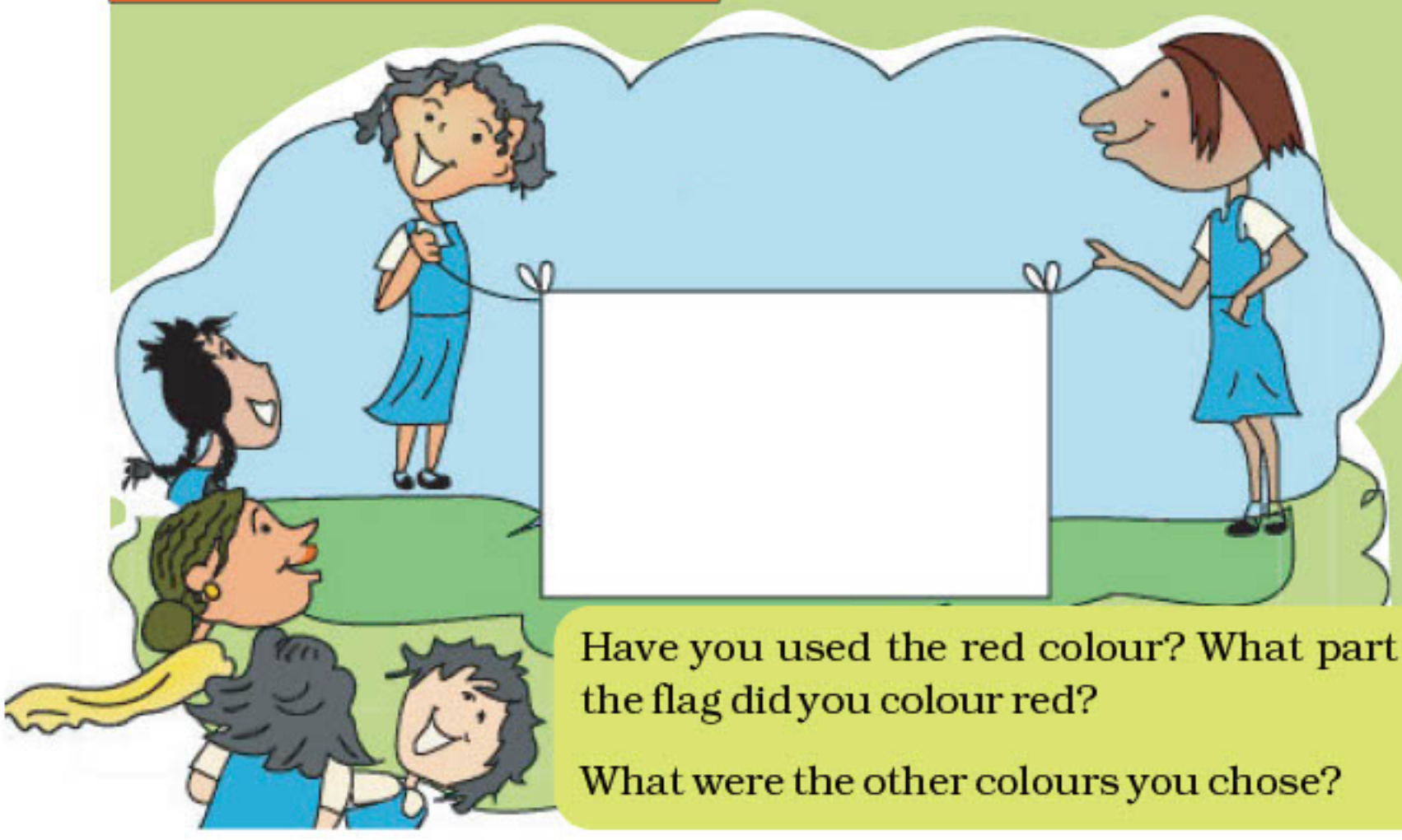
How many flags have three colours? Are all the coloured parts equal in these flags?

This is the flag of the Math Club in a school in Kerala. What part of the flag is coloured red? What part is green?



See this black logo. Draw it.

Is there a Math Club in your school? If not, ask your teacher how to set it up. Design a flag for your Math Club. Draw it here.



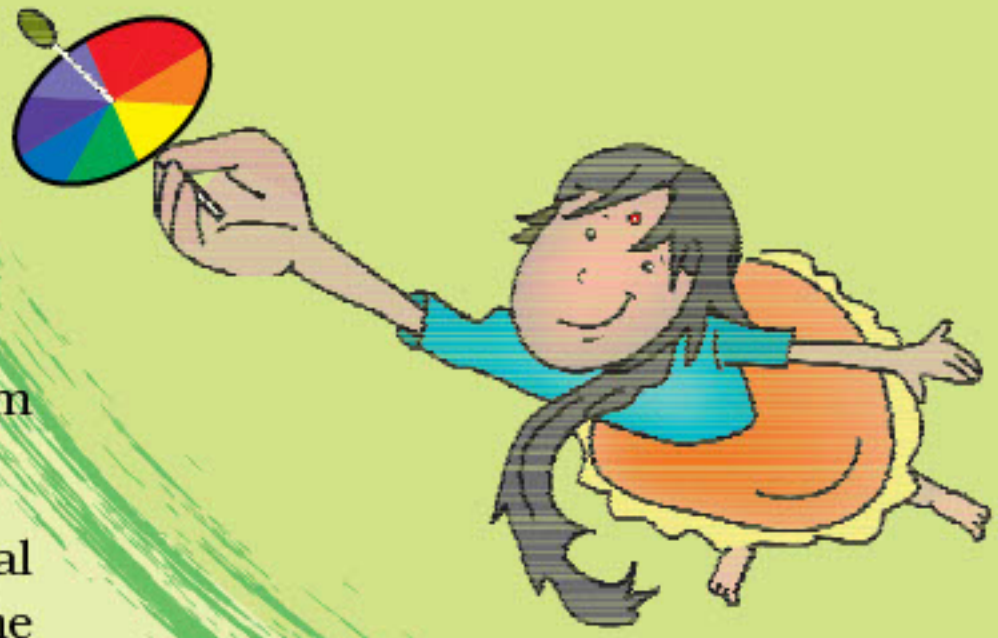
Have you used the red colour? What part of the flag did you colour red?

What were the other colours you chose?

Math Club can be set up in the school in which interesting activities can be taken up like making puzzles, shapes with tangrams, maps of buildings, looking for different geometrical shapes and angles in the environment, calculating area and perimeter of a school ground, etc.



Magic Top



Let us make a magic top.

Take a cardboard piece.

Draw a circle of radius 3 cm and cut it out.

Divide the circle into 8 equal parts. Now each part is $\frac{1}{8}$ of the circle.

Colour $\frac{2}{8}$ red, $\frac{1}{8}$ orange, $\frac{1}{8}$ yellow etc. as shown here. Push a matchstick through the centre of the circle .

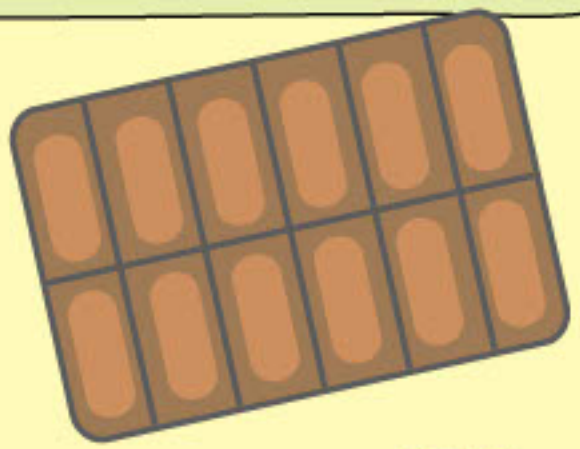


Your magic top is ready. Spin it fast!

What do you see? Can you see all the colours? Write what you see in your notebook.

Practice time

A) Chocolate bar



Manju had a chocolate. She gave one-fourth of it to Raji, one-third to Sugatha and one-sixth to Sheela. She ate the remaining part. How many pieces of chocolate did each get? Write here.



Raji _____



Sugatha _____

Sheela _____





Manju _____

What part of the chocolate did Manju eat?

B) Colour the hats

Colour $\frac{1}{3}$ of the hats red.

Colour three-fifth hats blue.

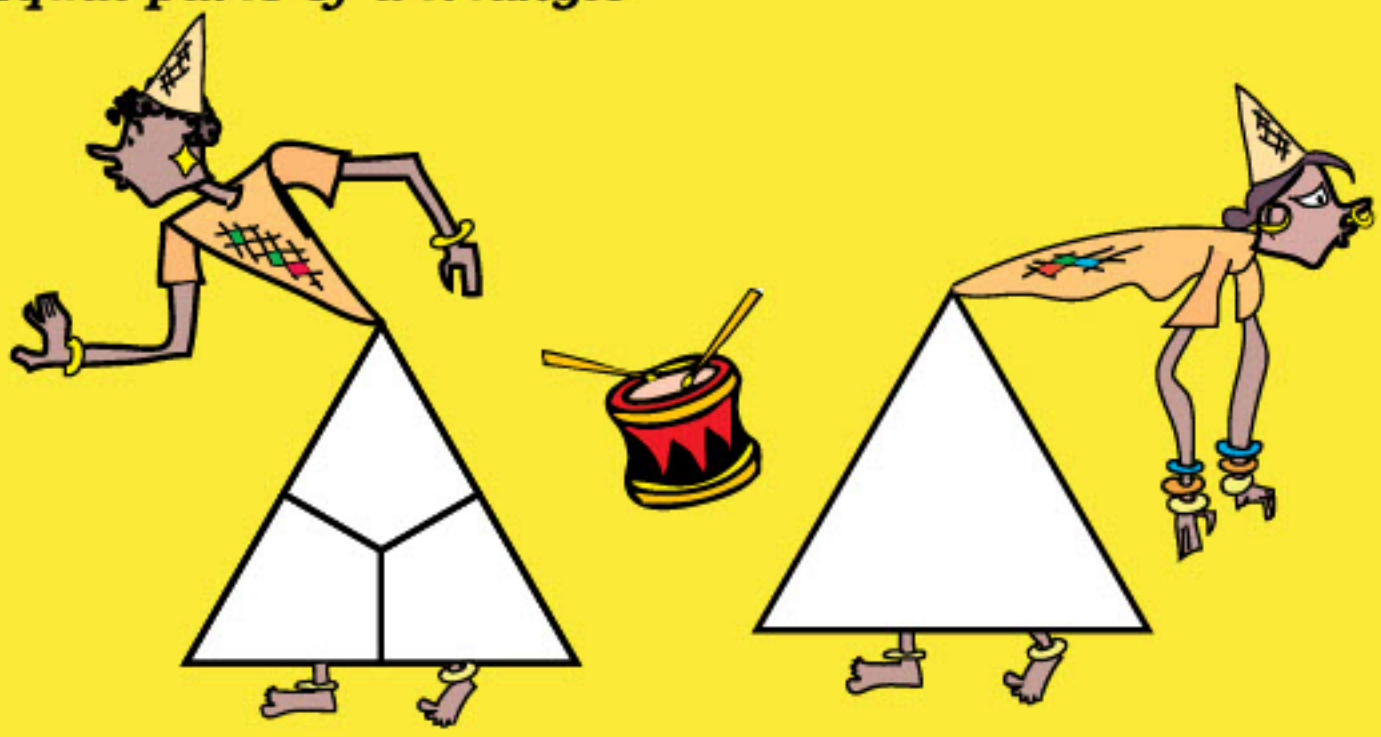
How many hats did you colour red?

How many hats did you colour blue?

What part of the hats are not coloured?



C) Equal parts of a triangle

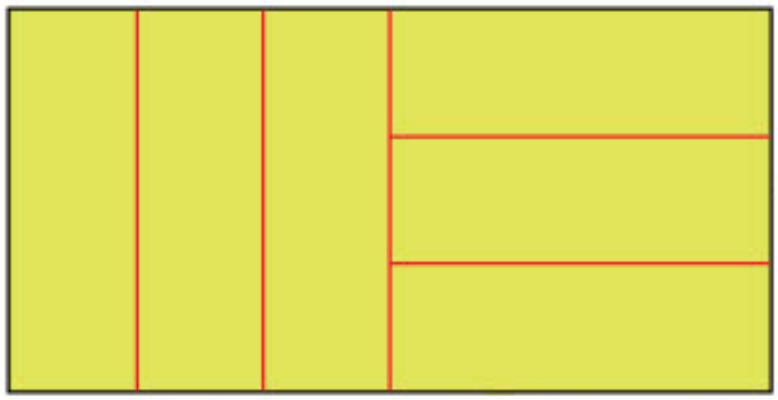


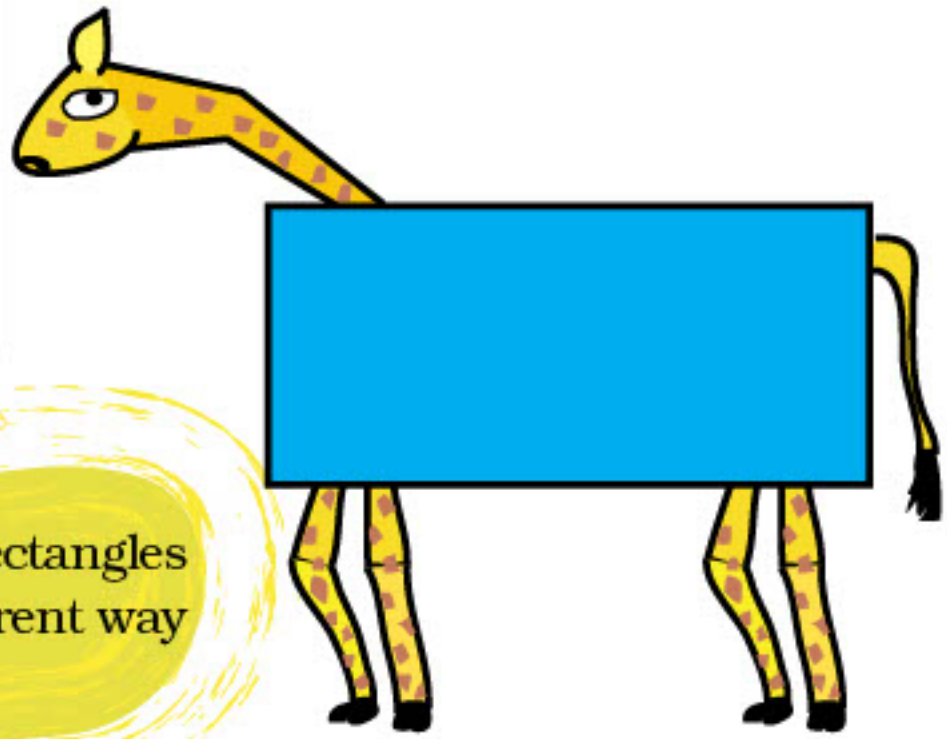
The white triangle is divided into three equal parts. Fill each one-third part with a different colour. Can you show that these parts are equal? Think how.

Now try to make three equal parts of this triangle in a different way. Colour each one-third with a different colour.

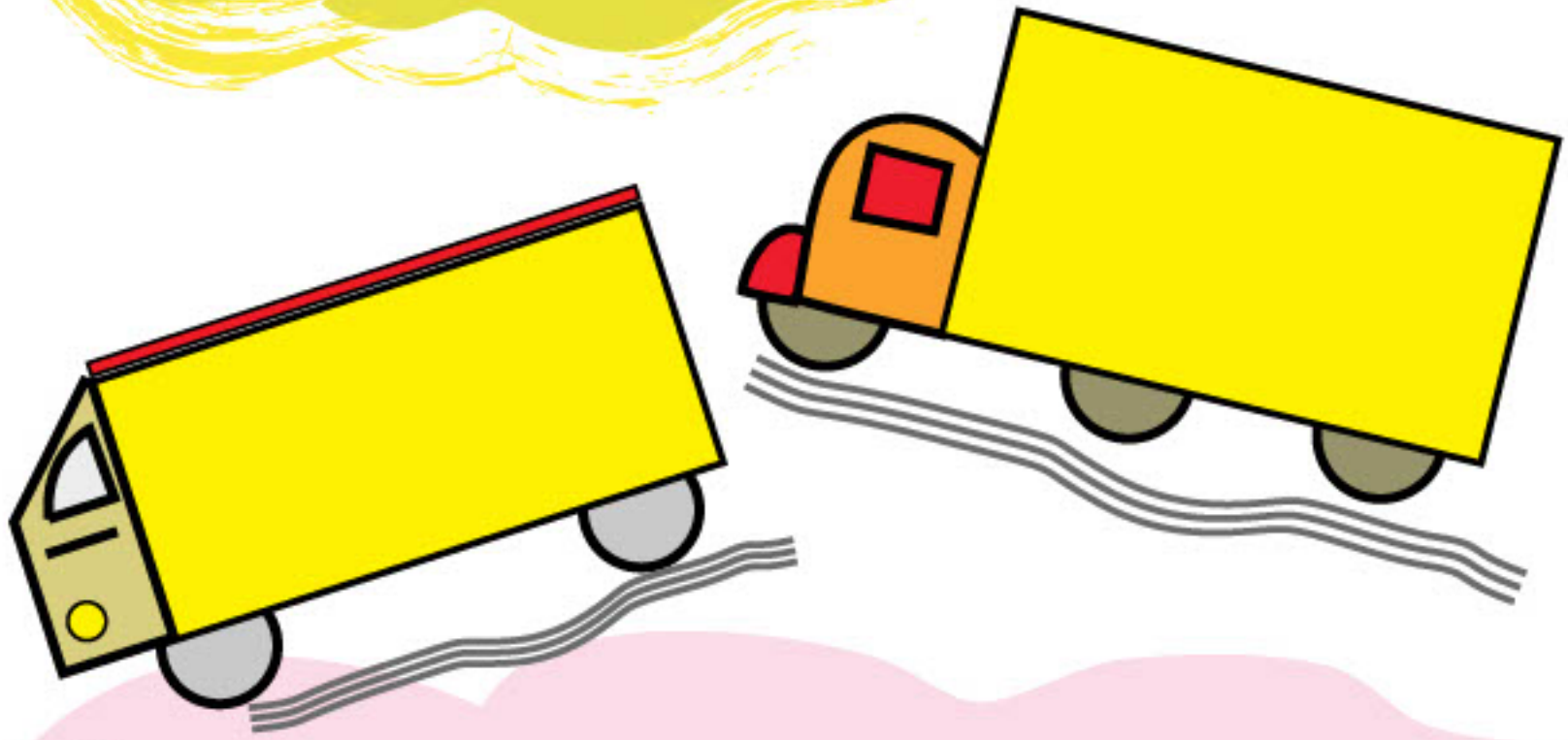
D) Six parts of a rectangle

Rani has divided a green rectangle into six equal parts like this.





* Now you divide each of these rectangles into six equal parts. Use a different way for each of the three rectangles.



Discuss



* How will you check that each part is really one-sixth of that rectangle?
* The green rectangle is bigger than the blue one. Can we say that $\frac{1}{6}$ of the green rectangle is bigger than $\frac{1}{6}$ of the blue rectangle?

Greedy Gatekeepers

Remember Birbal, the clever minister of King Akbar? (Math-Magic Class IV, page 14) Do you know how he became a minister?

Birbal was then a young boy living in a village. He was very clever and could write poetry.

He thought he would try his luck in the King's court. So he took some of his poems and set off for the city.

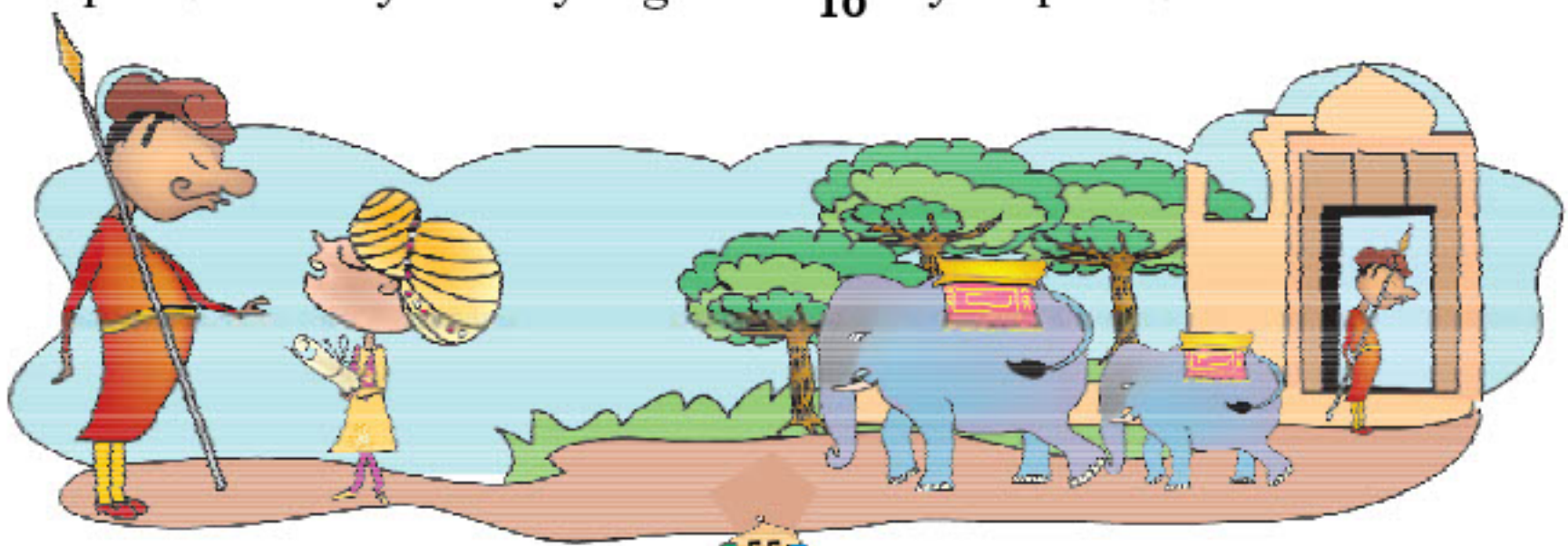
When he reached the outer gate of the palace, he was stopped by



the gatekeeper. "Hey! Stop there! Where are you going?", shouted the gatekeeper.

"I am a poet. I want to see King Akbar and show my poems to him", replied the poet.

"Oh, you are a poet! The king is kind, he will surely give you a prize. I will let you in if you give me $\frac{1}{10}$ of your prize".



Young Birbal agreed since he had no other way.

When he went in, the gatekeeper calculated "If he gets 100 gold coins I will get _____ gold coins".



The poet came to a second gatekeeper.

This gatekeeper also said, "I will let you in if you give me **two-fifth** of your prize". The poet agreed.

The gatekeeper happily calculated, "The poet will get at least 100 gold coins so I will get _____ gold coins!"

The poet reached the last gate. The gatekeeper said, "I will allow you to see the king only if you give me **half** of the prize that you get". The poet had no other way. He agreed and went inside.



The gatekeeper thought, "Today is a great day. If he gets 100 gold coins I will get _____ gold coins. But if he gets 1000 coins — wow! I will get _____".

The king was very happy with the poems and said, "Your work is very good. You can ask anything as your prize".

"My Lord, I want 100 slaps". "What! 100 slaps? _____". The king was shocked —

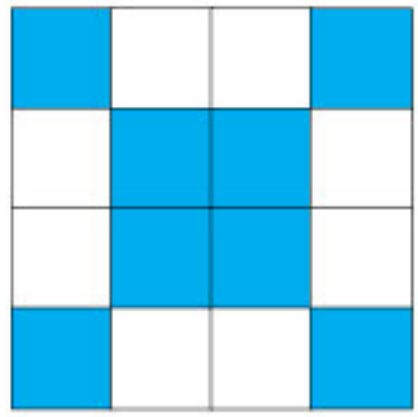
* What happened after that? Complete the story. What part of the prize did the poet get?



Patterns in Parts

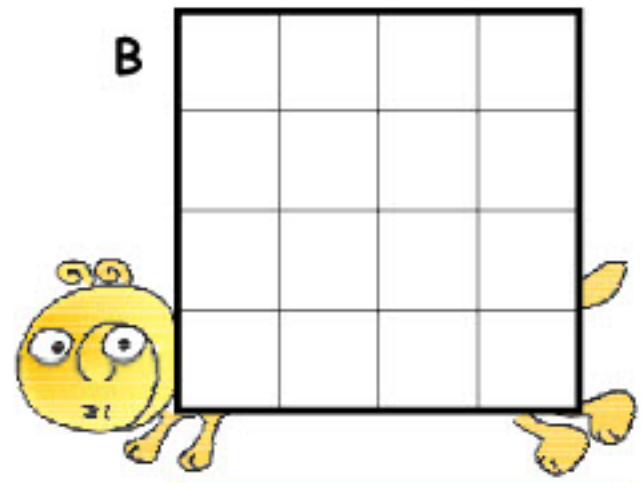
1) Make different patterns by colouring some squares in the grids B, C, D. What part of the grid did you colour? What part of the grid remained white? Write.

A

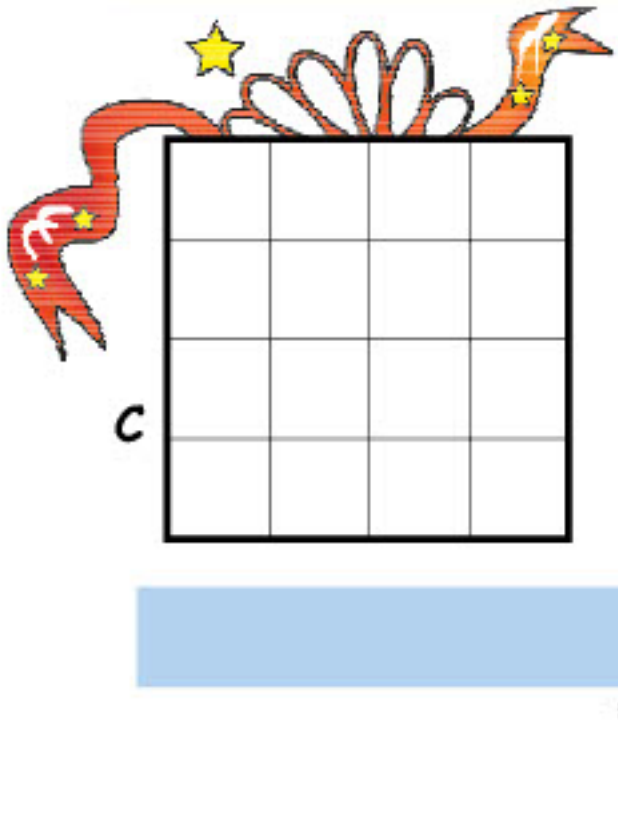


$\frac{8}{16}$ blue, $\frac{8}{16}$ white

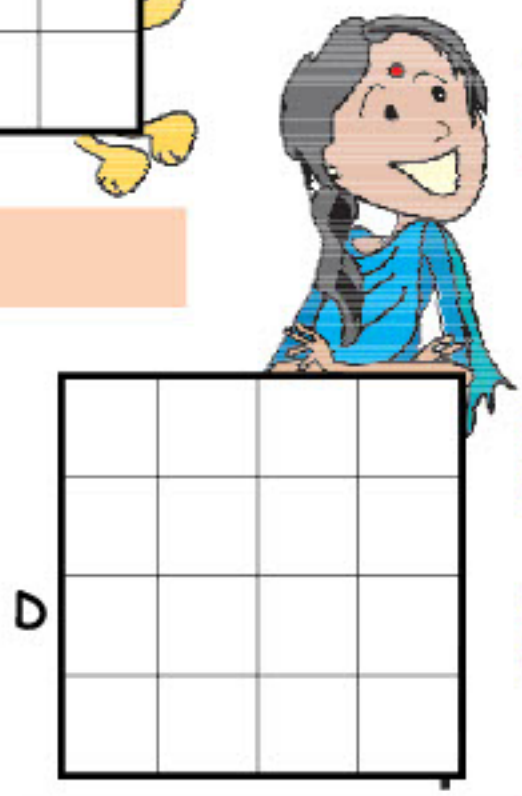
B



C



D



2) Look at grid A again. Is the grid coloured —

a) $\frac{1}{2}$ blue, $\frac{1}{2}$ white?

b) $\frac{2}{4}$ blue , $\frac{2}{4}$ white?

c) $\frac{3}{8}$ blue, $\frac{5}{8}$ white?

d) $\frac{4}{8}$ blue, $\frac{4}{8}$white?

Mark (×) on the wrong answer.

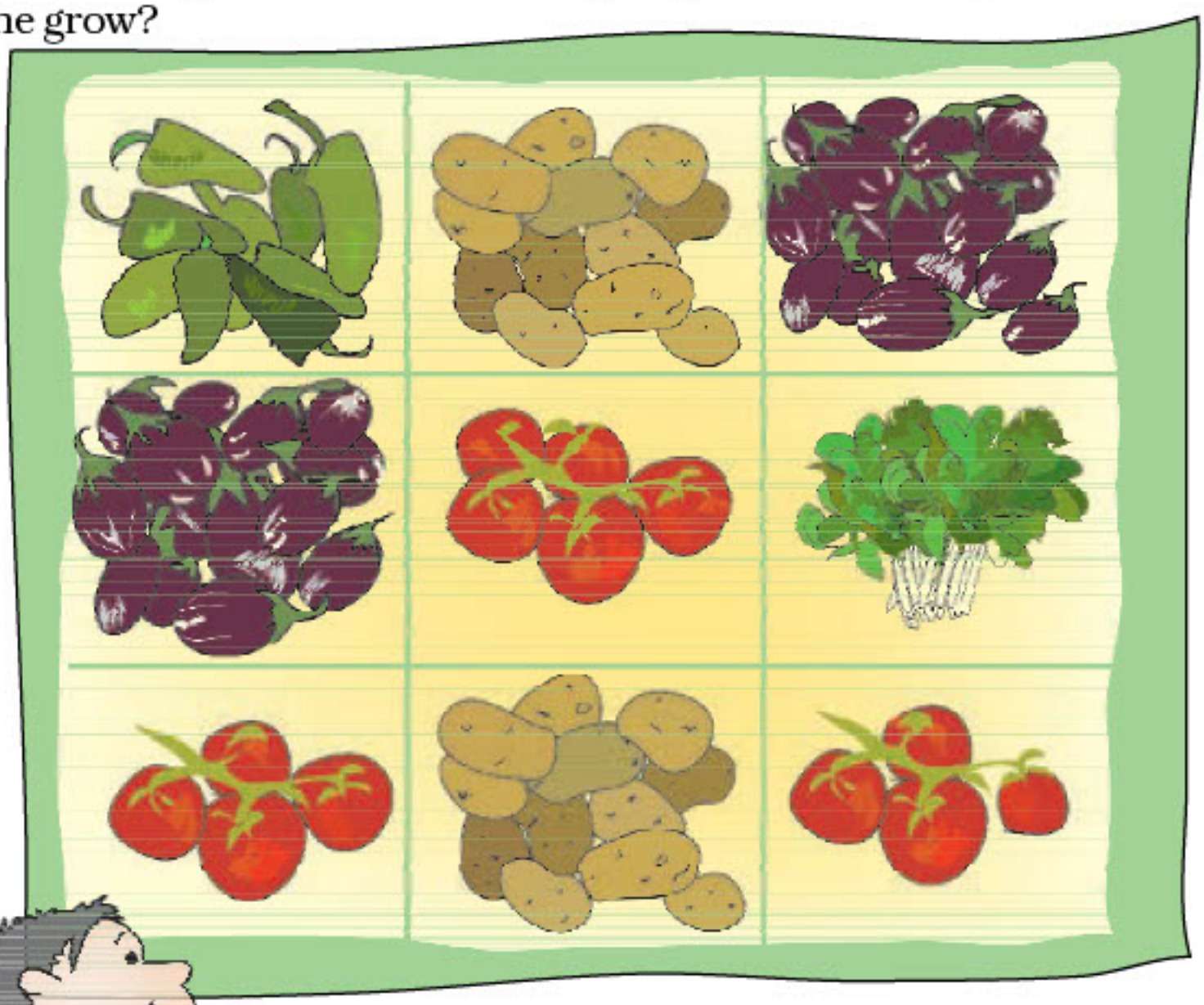
3) Draw grids of 16 squares and make patterns with

a) $\frac{2}{8}$ red, $\frac{1}{2}$ yellow, $\frac{1}{4}$ green

b) $\frac{3}{16}$ blue, $\frac{5}{16}$ red, $\frac{1}{2}$ yellow

Ramu's Vegetable Field

Ramu's vegetable field has 9 equal parts. What vegetables does he grow?





1) Which vegetable grows in the biggest part of his field? What part?

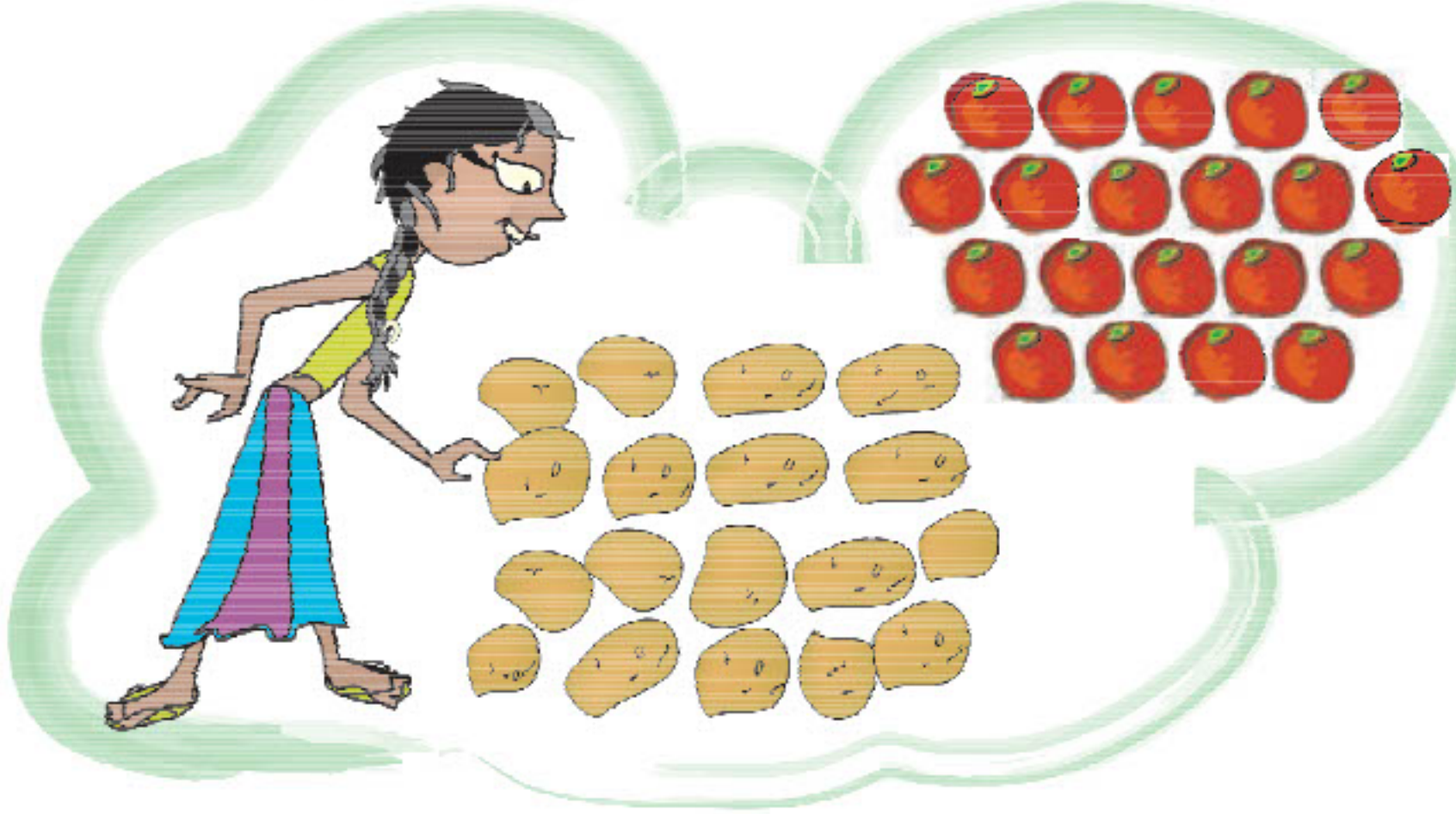
2) On what part of the field does he grow potatoes?

3) What part of the field is used to grow spinach? What part is used for brinjals?

4) Now you write some questions by looking at this picture.



* Ramu wanted to give these vegetables to his friends. He gave Aboobacker one-fifth of these tomatoes and $\frac{1}{3}$ of the potatoes. Srija got $\frac{2}{5}$ of the tomatoes and $\frac{3}{6}$ of the potatoes. Nancy got the rest of these vegetables. Circle Aboobacker's share in blue. Circle Srija's share in yellow.



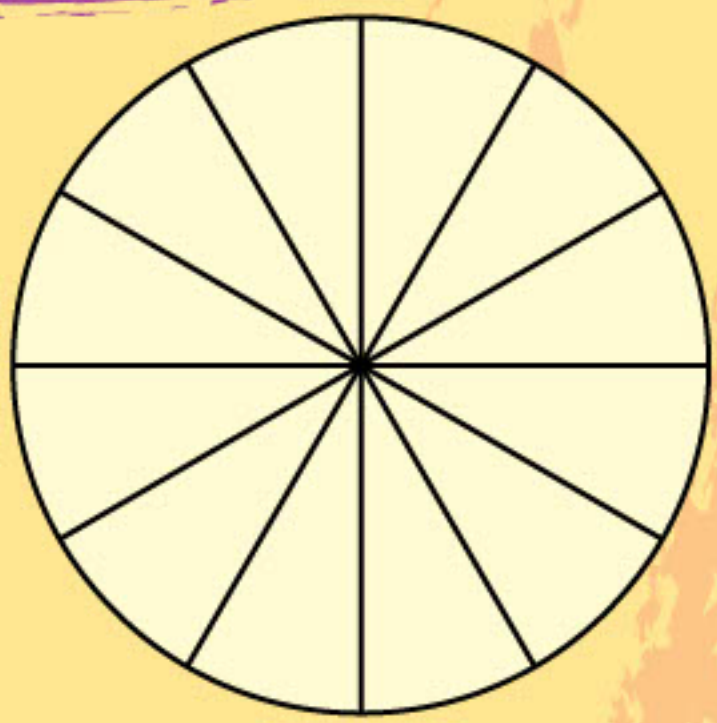
* How many potatoes and tomatoes did Nancy get?

Game: Who Colours the Circle First?

This game is to be played in groups of 4. Each player has to make a circle as shown. Each one has to make 15 tokens on slips of paper. Write $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{6}, \frac{1}{12}, \frac{2}{12}, \frac{3}{12}, \frac{4}{12}, \ldots\ldots \frac{11}{12}$ to make your tokens.

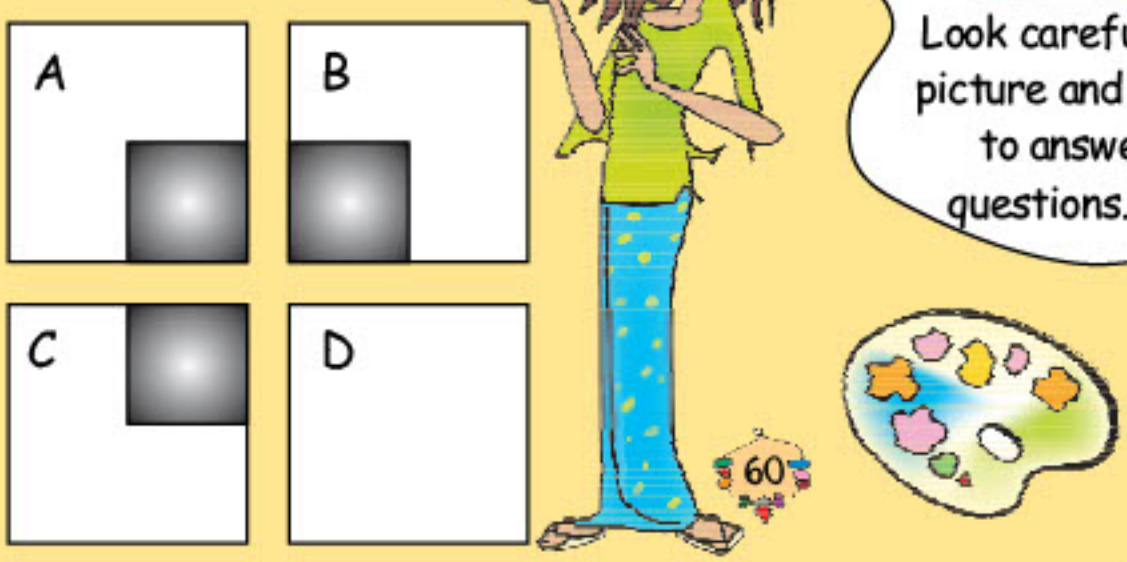
Shuffle the tokens and make a pile in the middle of the group. Now you are ready to start the game.

The first player takes a token from the pile, colours that part of the picture, and puts the token under the pile. The next player does the same, and so on. The winner is the one who first colours the circle completely.



- Who won the game?
- What are the winner's tokens?
- Write the tokens you got.
- What part of the circle did you colour?

The Card Puzzle



1) *Dwide the white area in square A into two equal parts.*

Got the answer? Was that easy?

Now do the second question.

2) *Dwide the white area in square B into three equal parts!*

That too is easy, isn't it?

Now see the third question.

3) *Dwide the white area in square C into four equal parts!!*

Is it a bit difficult? Don't worry, take your time.

Only if you have given up, look for the answer.

Here comes the last question .

4) *Dwide the white area in square D into seven equal parts!!!!*

The world record for this is 7 seconds. But you can take minutes!

Tired of thinking? Look for the answer on page 68.

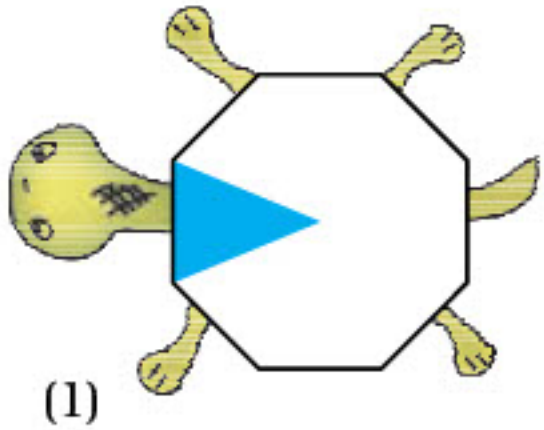
So was that difficult??



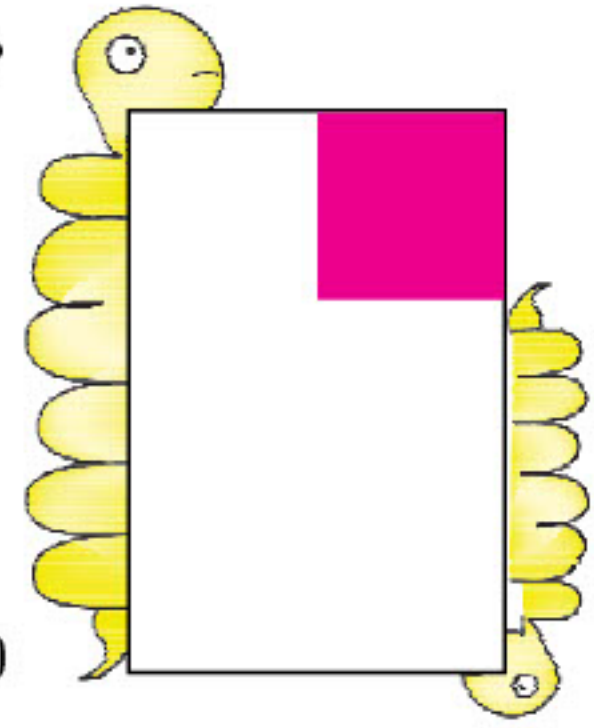
Guess and Check

A) What part of each shape is coloured?

First guess the answer, then check.



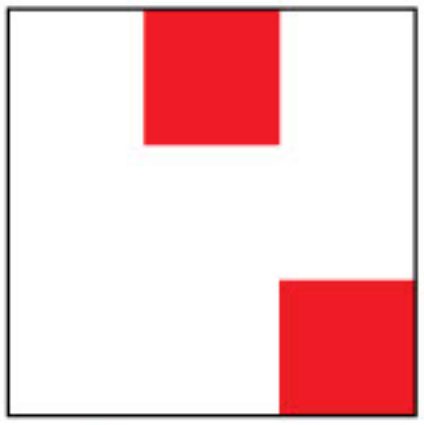
(1)



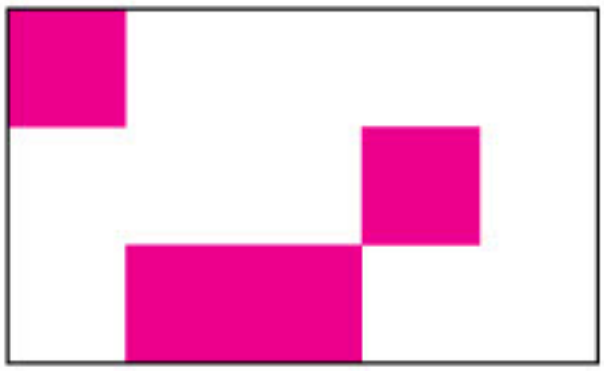
(2)

The colouring circle game and many more such activities should be done in class. The follow-up discussions for all these activities will play a major role in developing children's conceptual understanding about fractions.

(3)



(4)



B) Do you remember this picture? Look at the small triangle. What part of the square is it? How will you find this out?

Divide the big triangles and other shapes into small triangles (like the red one). How many small triangles are there altogether?



Coloured Parts

Complete these

1



This circle is divided into two equal parts. Out of _____ equal parts one part is coloured blue.

2



Here the circle is divided into _____ equal parts. Out of _____ equal parts, _____ parts are coloured blue.

3



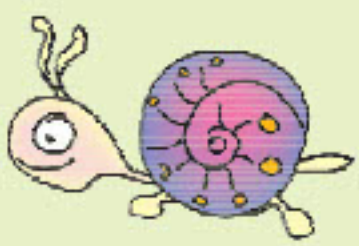
Here the circle is .....
.....
.....
.....

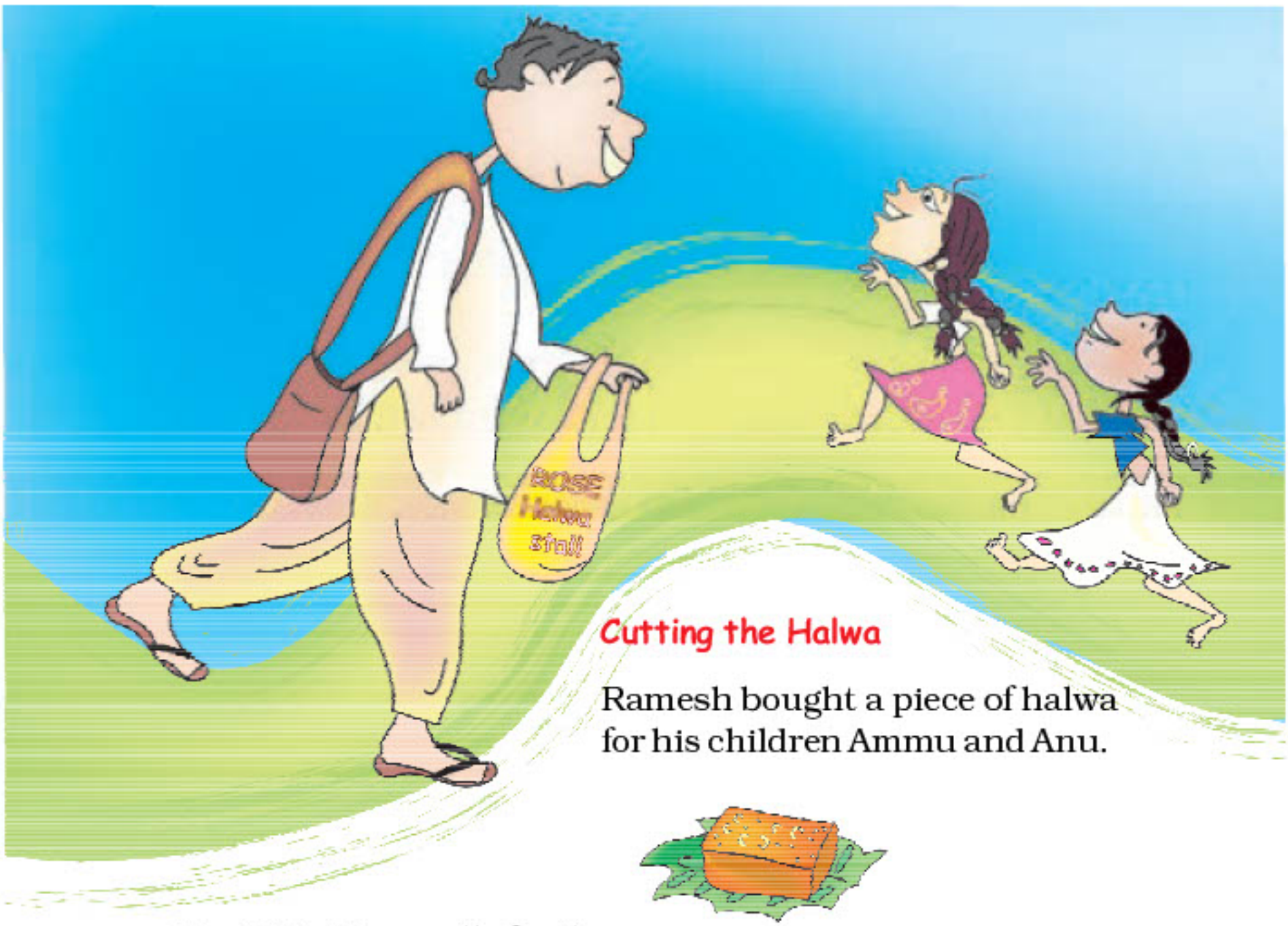
4



Here the circle is .....
.....
.....
.....

So we can say that $\frac{1}{2} = \frac{2}{....} = \frac{....}{6} = \frac{....}{8}$





Cutting the Halwa

Ramesh bought a piece of halwa for his children Ammu and Anu.

He divided it equally for them.

* Each will get _____ part of halwa.



"This piece is too big. We can't eat it", they said.

So he divided the pieces into half again. Now how many pieces will Ammu get? _____



* What part of the halwa is it? _____

"Make it even smaller, Dad" they asked.

So he again cut the halwa into smaller pieces.

"Ok, thank you, Dad."



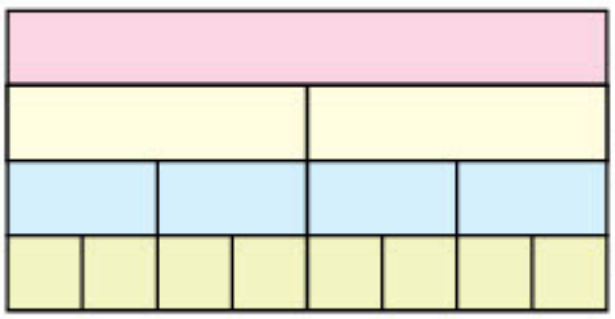


* Now how many pieces will each get?
* What part of the halwa is each piece now?
* If Ramesh had cut the halwa into 6 equal parts how many pieces would each have got? Look at your answers for questions 1 to 4 and write—

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

Parts of the Strip

Look at the picture. Write what part of the strip is each green piece. Write the part for a piece of each colour.



How many one-fourths will make a half?

How many $\frac{1}{8}$ will make $\frac{1}{4}$?

How many $\frac{1}{8}$ are in $\frac{1}{2}$?

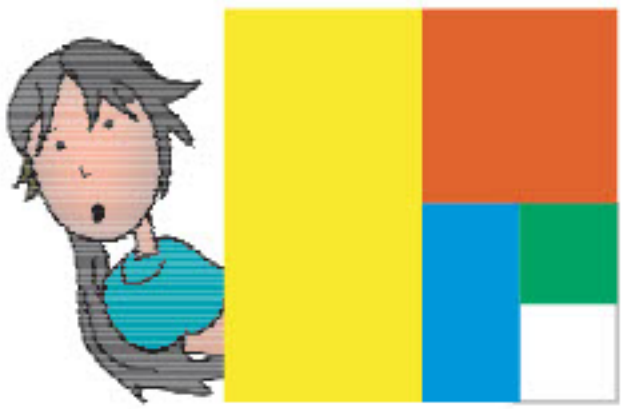
Now ask your friends some questions on the same picture.

Patterns

Look at this square.

What part is coloured blue?

What part is green?



Puzzle: Is it Equal?

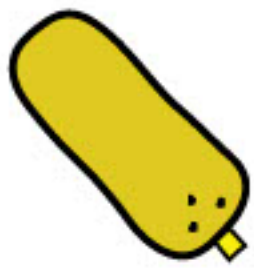
Ammini says half of half and one-third of three-quarters are equal. Do you agree? How will you show this?

The use of concrete things (such as matchsticks, bottle caps etc.) will help children make sense of equivalent fractions such as $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10}$. Children must make their own fraction strips using papers of different sizes. Encourage them to compare the strips by colouring them into different fractions.

From a Part to the Whole

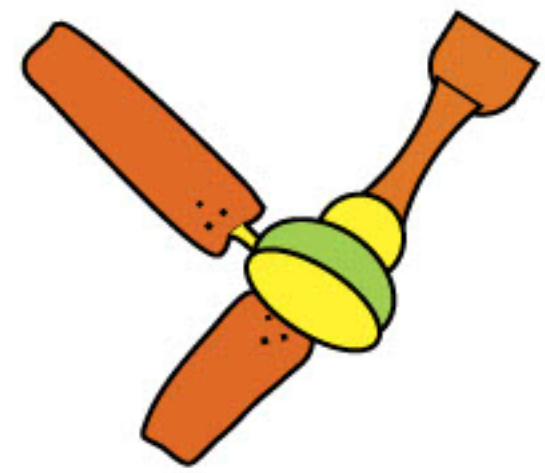


1) This show $\frac{1}{5}$ petals of a flower. Complete the flower by drawing the other petals.



2) The picture shows one-third of the blades of a fan. Complete the picture by drawing the other blades.

3) Half of the blades of another fan are shown here. Complete the picture by drawing the other half. How many blades have you drawn?



Rupees and Paise

How many 

will make one rupee?

Is 50 paise half of one rupee?

How many 

will make one rupee?

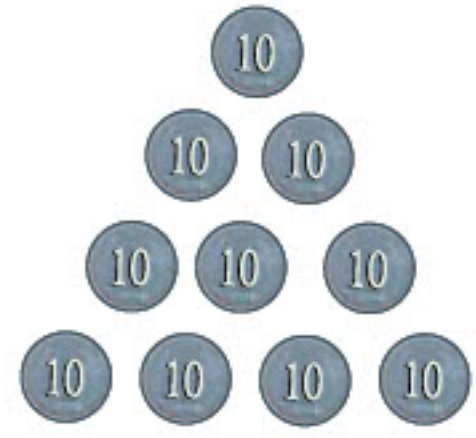


25 paise is _____ part of one rupee

20 paise is _____ part of one rupee

How many 10 paise will make one rupee?

So 10 paise is _____ part of one rupee.



An Old Woman's Will

Once there lived an old woman. She lived with her three daughters. She was quite rich and had 19 camels. One day she fell ill. The daughters called the doctor. The doctor tried his best but could not save the woman. After her death, the daughters read what she had written in her will.

My eldest daughter will get $\frac{1}{2}$ of my camels
My second daughter will get $\frac{1}{4}$ of my camels
My third daughter will get $\frac{1}{5}$ of my camels



The daughters were really puzzled. "How can I get $\frac{1}{2}$ of the 19 camels?" asked the eldest daughter.

"Half of 19 is nine and a half. But we can't cut the camel!" The second daughter said.

"That is right. But what will we do now?" asked the third daughter".

Just then they saw their aunt coming. The daughters told her their problem.

"Show me the will. I have an idea. You take my camel. So you have 20 camels. Now can you divide them as your mother wanted?" the aunt said.

"You want half of the camels, don't you? Take 10 camels" she said to the eldest daughter.

"Take your share", the aunt told the second daughter. She took one-fourth of the camels and got _____ camels.

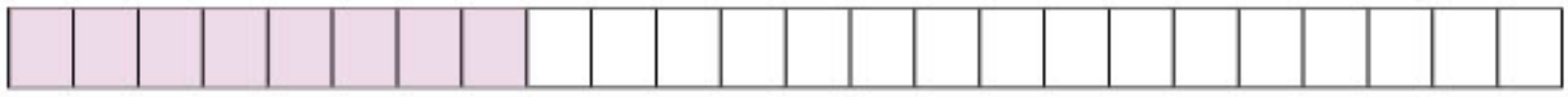
"You can take one-fifth of the camels", the aunt told the third daughter. She got _____ camels. The daughters were very happy and counted their camels 10+_____+_____=19.

"The one remaining is mine", said the aunt and took her camel away!



* How did this happen? Discuss.

Arun's Time Table



Sleeping: One third of a day

Use different colours to show

Playing: One eighth of a day

Studying: $\frac{1}{4}$ of a day

How many hours does Arun take for

Sleeping? ____ hours

Studying? ____ hours

Playing? ____ hours

What part of the day does he use for other activities?



School Magazine

A school has decided to bring out a magazine every quarter of the year. How many magazines will they have in a year? If they want to print it at the end of each quarter of a year, which are the months for printing? Mark the number for those months.

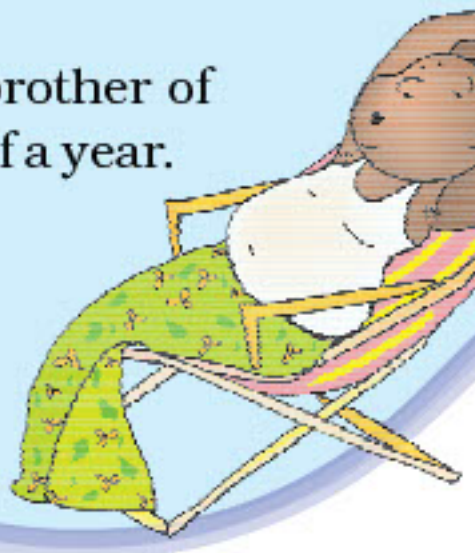
1	2	3	4	5	6	7	8	9	10	11	12

Sleeping Beauty!

Have you heard of Kumbhakarna, the brother of Ravana? He is famous for sleeping for half a year.

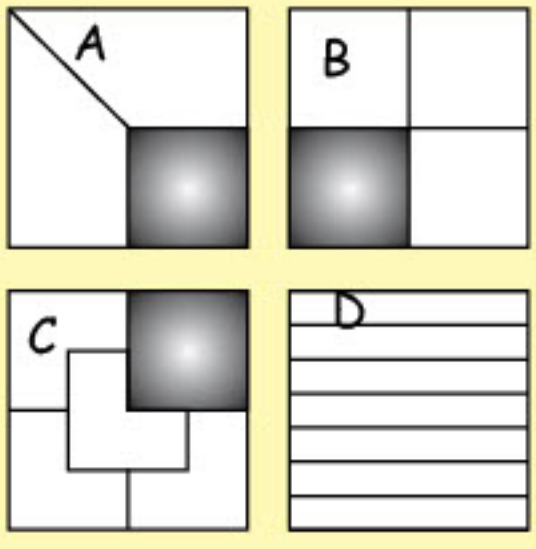
Most people sleep about 8 hours a day. Then what part of a day is it? _____

So what part of a year do they sleep? A person 60 years old must have slept _____ years!!!

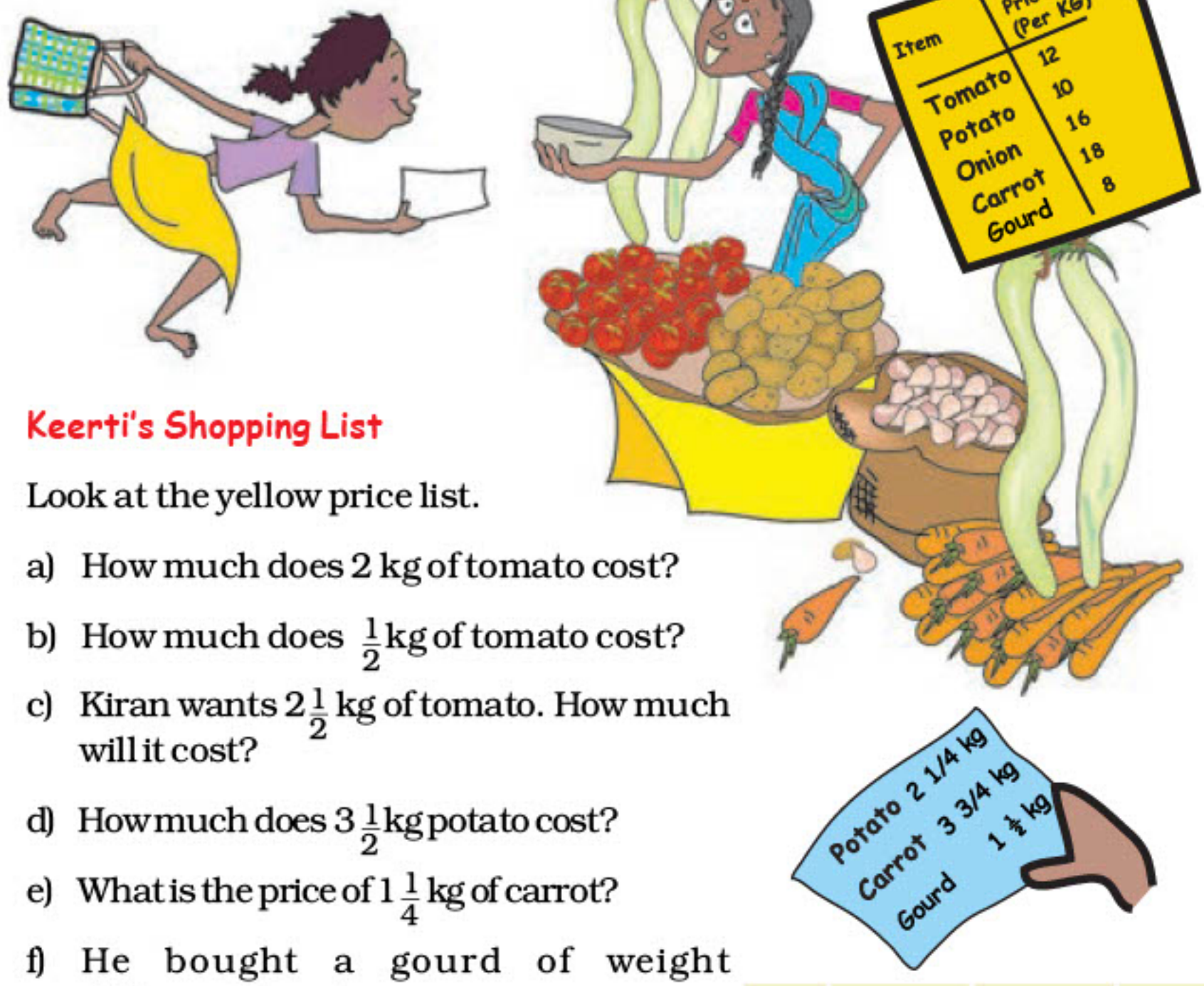


Answer: Card Puzzle (page 61)

Did you get stuck on square D? Actually that was the easiest!!



Children should be encouraged to think of what part of a day they spend in different activities. They should be sensitive about those children who have to spend a large part of the day working or helping at home. They should also be encouraged to think about parts of a year.



Keerti's Shopping List

Look at the yellow price list.

a) How much does 2 kg of tomato cost?

b) How much does $\frac{1}{2}$ kg of tomato cost?

c) Kiran wants $2\frac{1}{2}$ kg of tomato. How much will it cost?

d) How much does $3\frac{1}{2}$ kg potato cost?

e) What is the price of $1\frac{1}{4}$ kg of carrot?

f) He bought a gourd of weight $4\frac{3}{4}$ kg and it costs _____

g) Look at the shopping list in Keerti's hand. How much will she have to pay to buy all of these?

h) Make a bill of your own for vegetables you want to buy. Find the total money you will have to pay.

Item	*Price in ₹ (per kg)*	*Quantity*	*Amount*
		Total	

Children should be encouraged to bring samples of real price lists and bills to discuss in the classroom.

Practice time

1) Raheem's journey

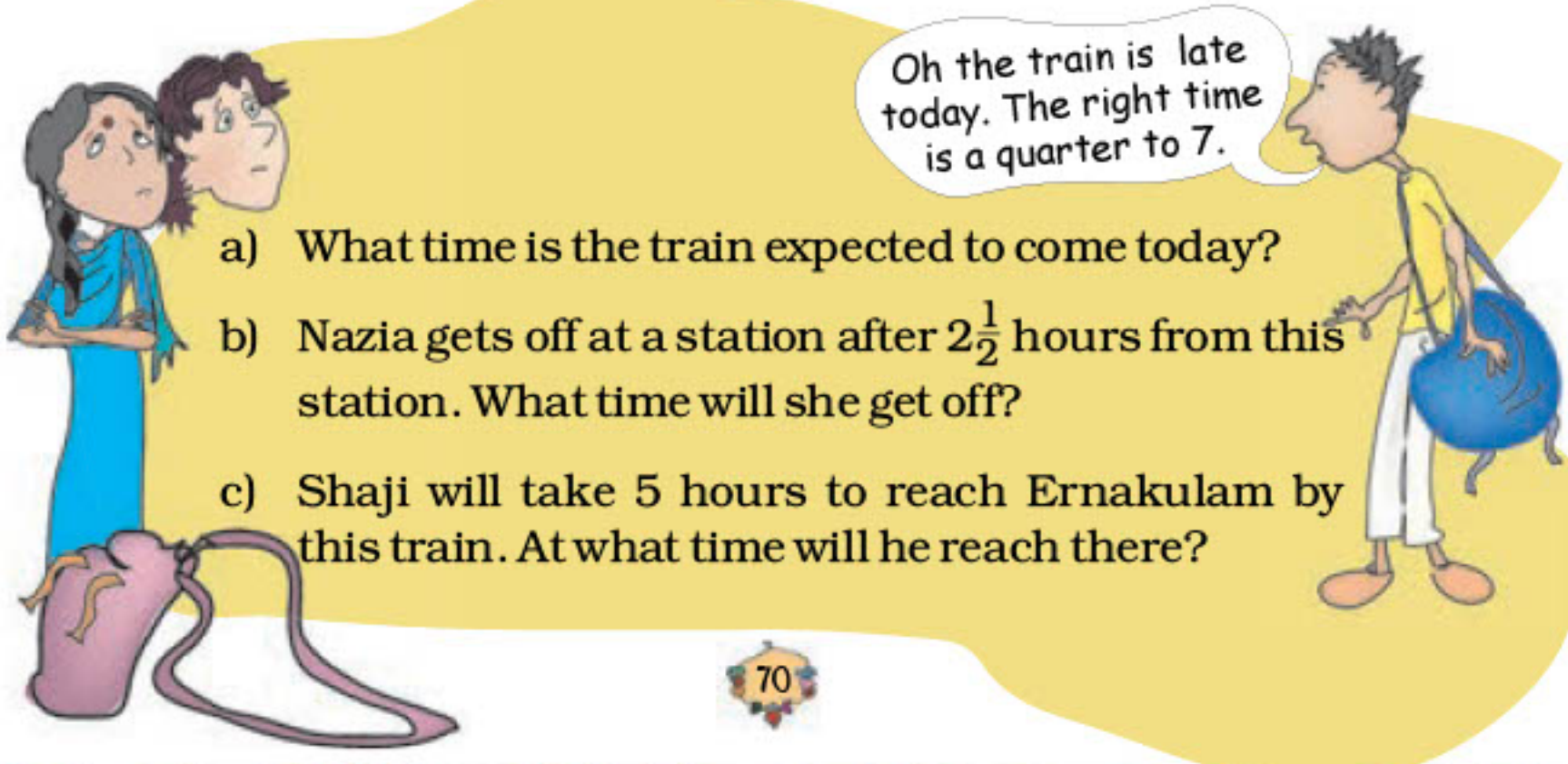
Raheem has to travel $1\frac{1}{4}$ km to reach school. What distance does he travel to go to school and come back home?

2) What coins?

Latha bought a pencil and a pen for seven and a half rupees. She gave ₹ 10/–. The shopkeeper gave back the money in half and quarter rupees. What are the coins she got?

3) At the railway station





a) What time is the train expected to come today?

b) Nazia gets off at a station after $2\frac{1}{2}$ hours from this station. What time will she get off?

c) Shaji will take 5 hours to reach Ernakulam by this train. At what time will he reach there?