Text-cum-workbook

CHILD CHILD

Arun T. Mavalankar H. C. Pradhan

Homi Bhabha Curriculum for Primary Mathematics

Homi Bhabha Centre for Science Education Tata Institute of Fundamental Research, V.N. Purav Marg, Mankhurd, Mumbai 400 088

Maths for Every Child

Text - cum - workbook Class I Revised Edition, 2004 Reprint 2009,2017

Authors

Arun T. Mavalankar H. C. Pradhan

Design and Illustrations

Anagha Deshpande (anagha_nd@vsnl.net) Pune

Assistance

Smita Patil

Homi Bhabha curriculum General Co-ordinator

Arvind Kumar

Primary Mathematics Co-ordinator

H. C. Pradhan

Published by

Homi Bhabha Centre for Science Education Tata Institute of Fundamental Research V. N. Purav Marg, Mankhurd, Mumbai 400 088.

2009, Homi Bhabha Centre for Science Education

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior permission of the publisher. This book is sold subject to the condition that it shall not by way of trade be lent, re-sold, hired out or otherwise disposed of without the publisher's consent in any form of binding or cover other than that in which it is published.

General Preface

Not a day passes in our country when somebody somewhere has not criticized our system of education, particularly our school education. A great many ills and inadequacies of the system probably flow from extraneous causes and need socio-political initiatives that go beyond mere reforms in the school curriculum. Some problems however arise directly from the curriculum - text books, teaching and evaluation practices. We need to keep these problems in view and to continually devise new curricula to overcome them.

Curricular reform efforts and innovations are not new to our country. Nearly every decade, there have been initiatives by the Central and State government agencies to effect changes in curricula. Several independent school networks and voluntary groups have brought out their own textbooks and related material. There is no doubt that significant progress has been made by the country in better conceptualization of the school curriculum at primary, middle and secondary levels. The paradigms of school curriculum in India have steadily evolved and become more relevant and modern. Unfortunately, the over-all deterioration of the system due to extraneous factors has tended to obscure these gains. Also, and most important for our purpose here, there is a large gap between the generally agreed objectives of the curriculum and their actual translation into textbooks and teaching practices.

Homi Bhabha Curriculum is basically an attempt to close this gap as much as possible. It is not conceived to be a revolutionary curriculum. The broad aims of the curriculum are much the same as those articulated in countless reports and articles of different education departments and agencies. The idea is not to produce a fanciful, 'museum-piece' curriculum that nobody would adopt, but to attempt to discover a sound and wholesome curriculum that is practical to implement in our school system. 'Practical' is, however, not to be regarded as a euphemism for the status quo. As the users will find out, the alternative textbooks of the Homi Bhabha Curriculum are full of radical unconventional ideas that we believe are both urgent, necessary and, given enough efforts, feasible. But rather than describe here what we believe to be these innovative aspects, we leave the users, students and teachers, to find and experience them. In the simplest and most favourable situations, devising a curriculum and translating it into books, laboratories and teacher manuals is a daunting task. In the complex parameters and constraints that govern our country's educational system, the task is formidable. Only time will tell if and to what extent the Homi Bhabha Curriculum is an effort in the right direction.

Arvind Kumar

Note to the teachers and parents

As you go through the pages of Maths for Every Child, you will notice some differences from other textbooks. We have tried to make the book attractive in appearance and interesting to children. However, the most important differences are not in the appearance.

Our aim is to move away from an emphasis on merely learning procedures to an emphasis on understanding. In addition to the learning of facts and procedures, we have laid stress on the connections between concepts and procedures and on mental arithmetic skills. In many places, we have provided the child with enough concrete and semi concrete experience that will form a strong foundation for further mathematical learning. While doing all this we have retained the positive elements of the traditional approach : systematic organization of topics, careful sequencing and plenty of practice.

Our attempt has also been to make the text-cum-workbook to be teacher friendly and easy to implement in the classroom. we would appreciate your feedback about how you used the book and your suggestions.

Arun T. Mavalankar H. C. Pradhan

iv

Acknowledgement

Prof. Arvind Kumar, Centre Director, HBCSE initiated the Homi Bhabha curriculum project and gave us constant encouragement. Dr. K. Subramaniam shared his insights and helped to make significant improvements in the content and presentation.

Anagha Deshpande did the format and design of the book and contributed ideas for stories. Nilesh Nimkar of Gram Mangal, Dahanu, gave valuable feedback and suggestions. Sandhya Khandare, Head Mistress and teachers of the Nutan Vidya Mandir, Mankhurd gave permission to try the curriculum material in their classrooms. Smita Patil and Shweta Naik helped in producing the drafts.

It is pleasure to express our sincere thanks to all of them.

Arun T. Mavalankar H. C. Pradhan

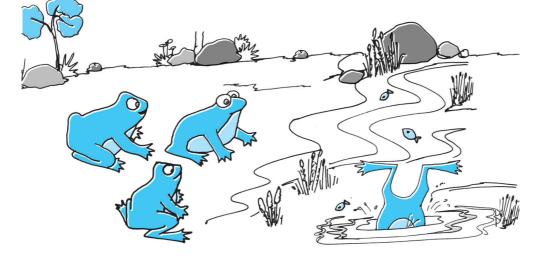
Part 1

- Unit 1 : Before we count
- Unit 2 : Numbers 1 to 5
- Unit 3 : Numbers 6 to 9

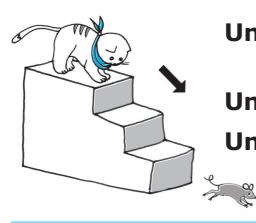


Part 2

Unit 4 : Bigger and smaller Unit 5 : Addition (1 to 9) Unit 6 : Subtraction (1 to 9)

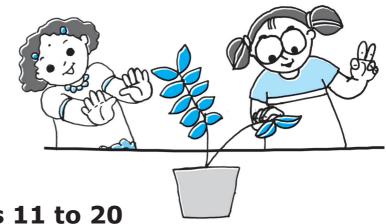


Part 3



Unit 7 : Up - Down, Before - After

- Unit 8 : Geometry
- Unit 9 : Zero and Ten



Part 4

Unit 10 : Numbers 11 to 20

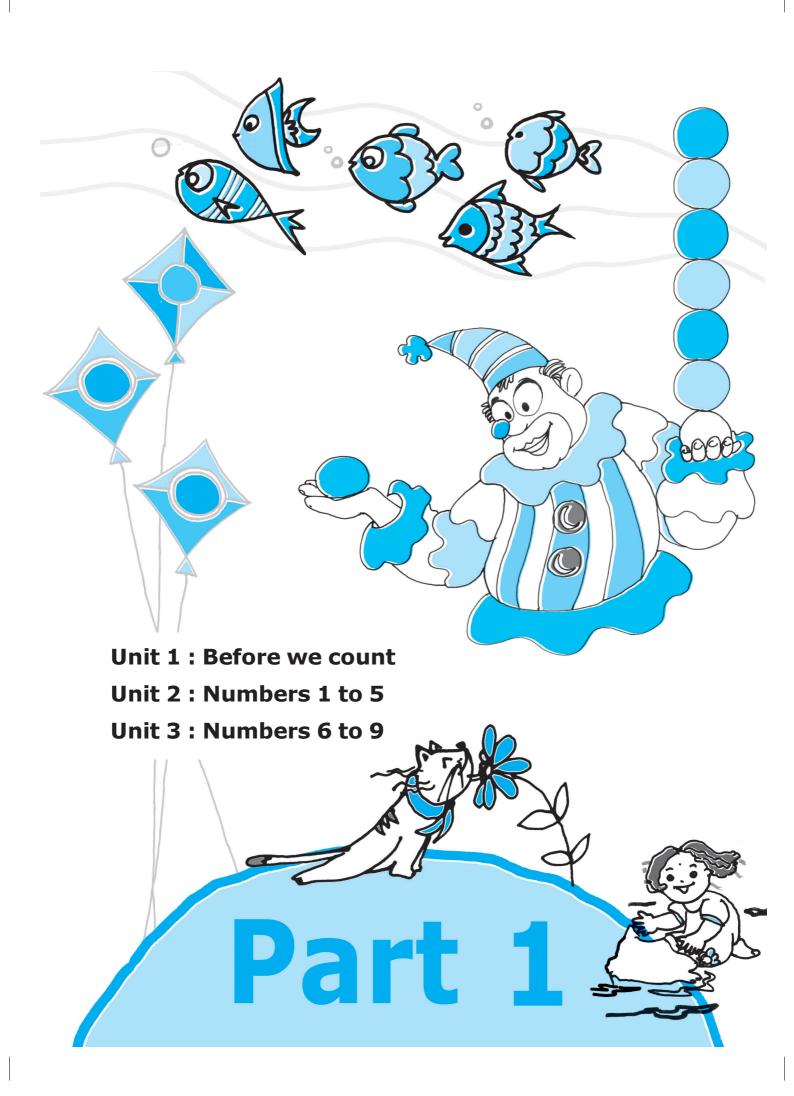
Unit 11 : Addition-Subtraction (0 to 20)

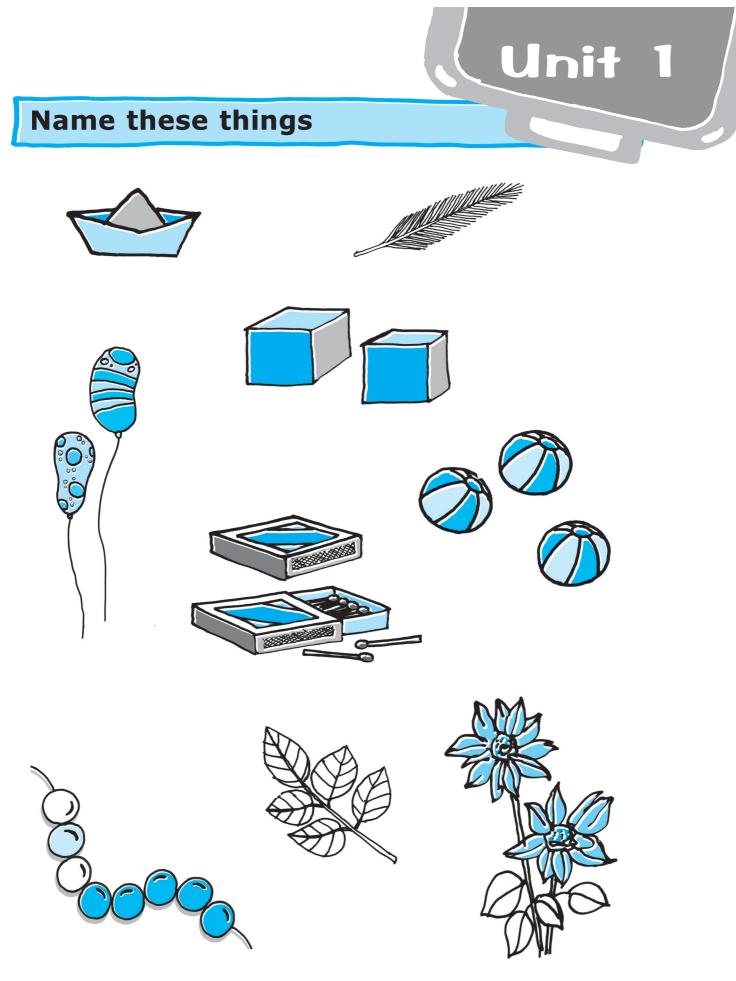
Part 5

Unit 12 : Numbers 21 to 50

Unit 13 : Numbers 51 to 100



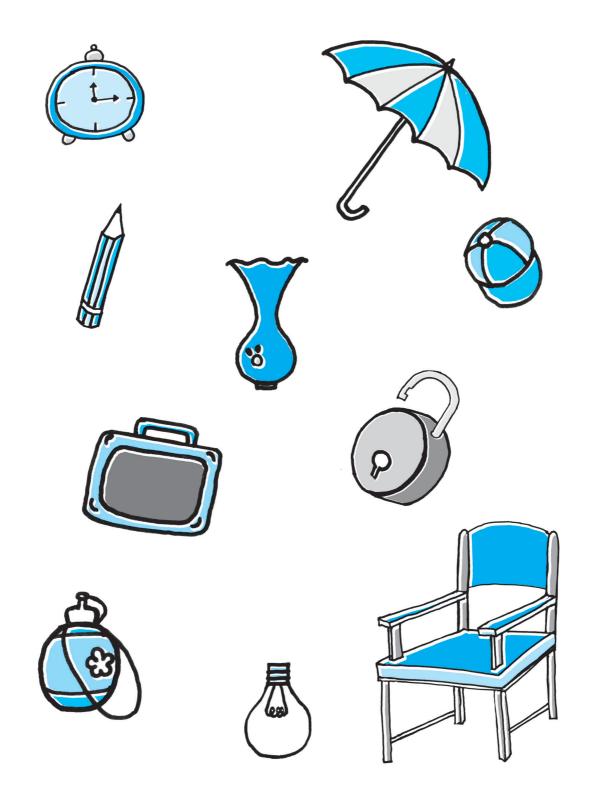




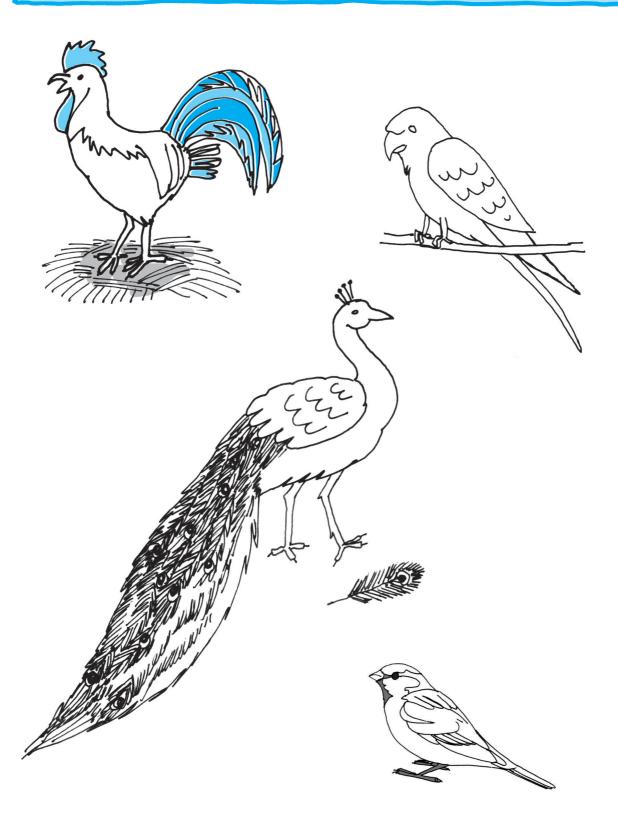




Name these objects



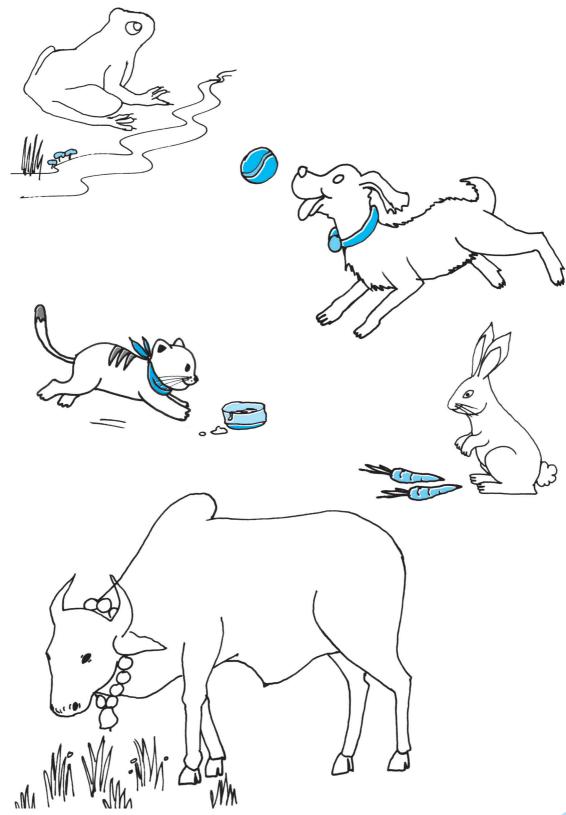
Name these birds







Name these animals

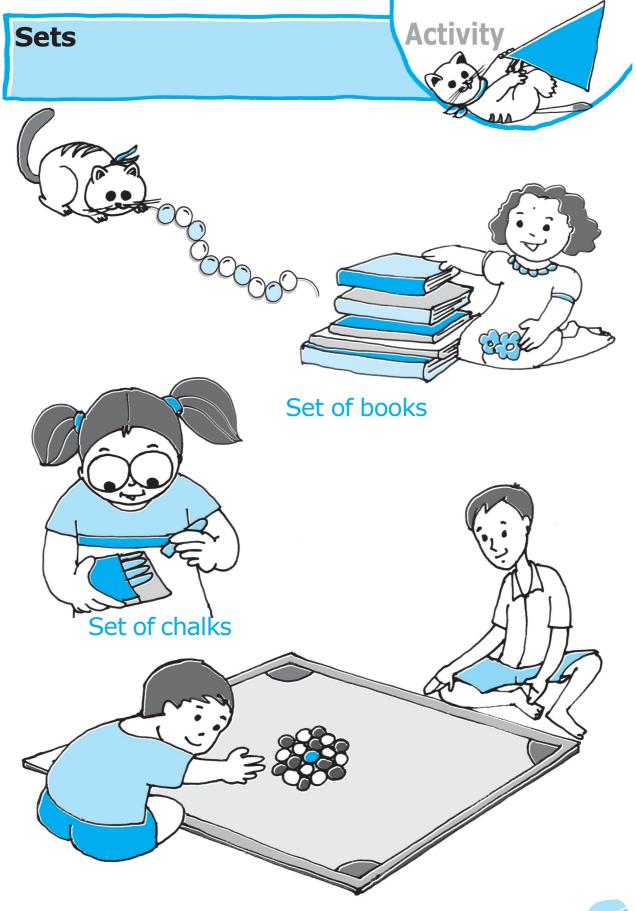


Unit 1 / Before we count

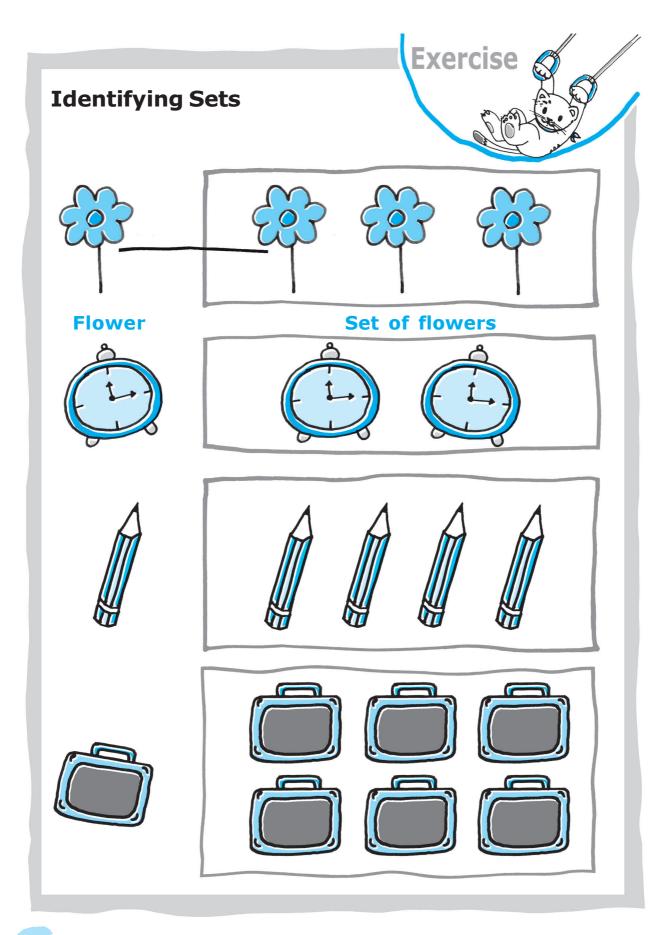
Name these pictures



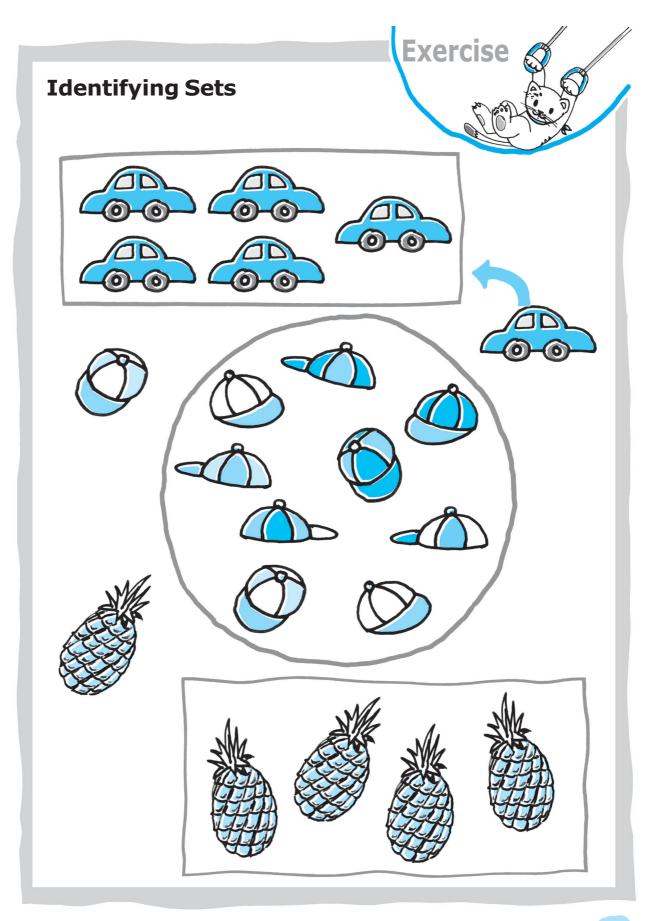
6



Unit 1 / Before we count

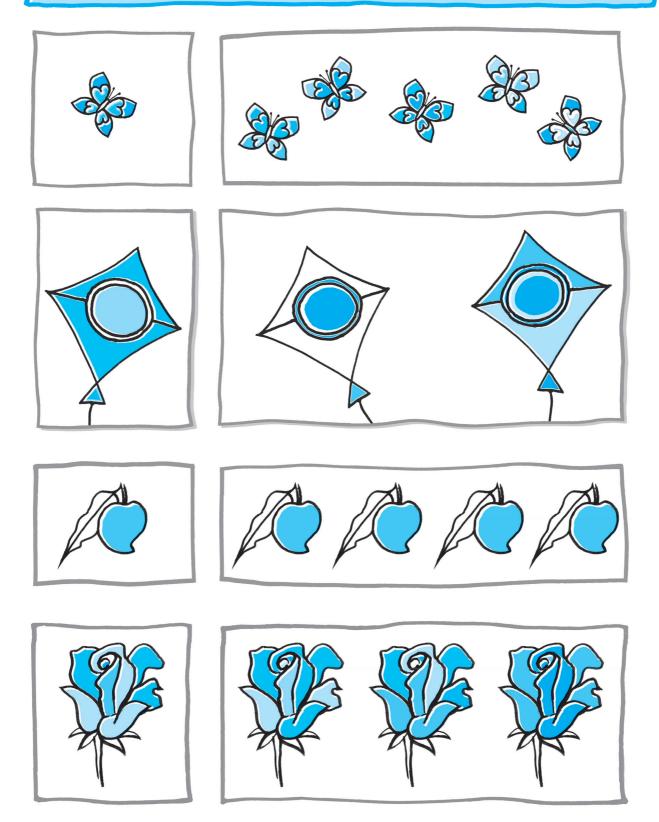


Unit 1 / Before we count



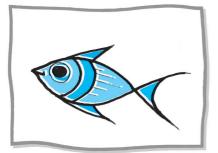
Unit 1 / Before we count

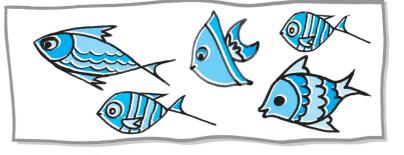
One-Many

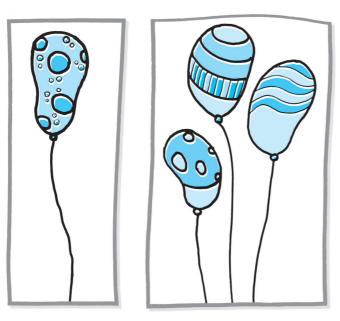


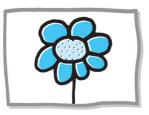


One-Many





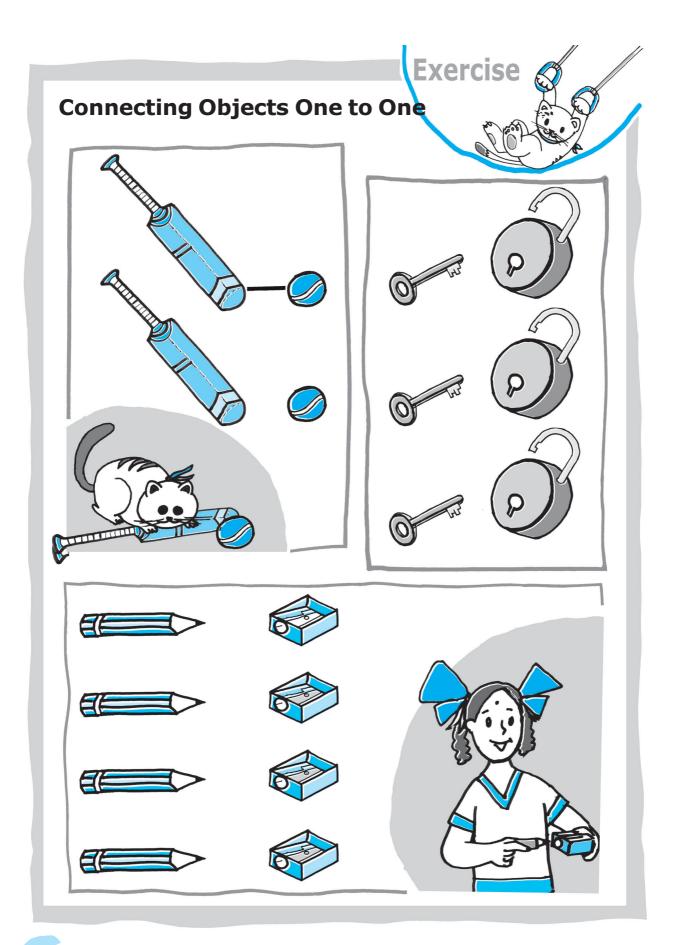


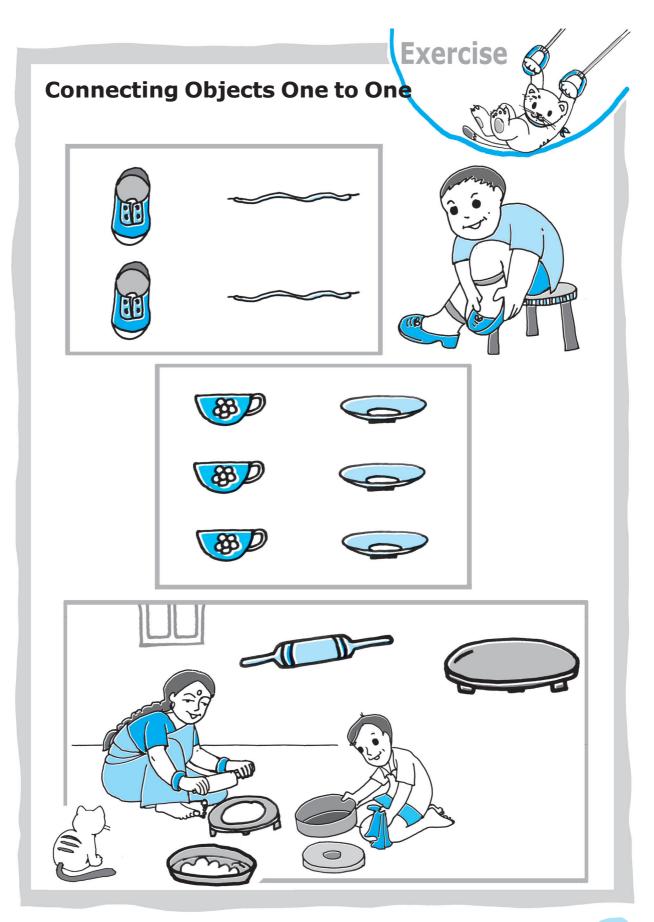


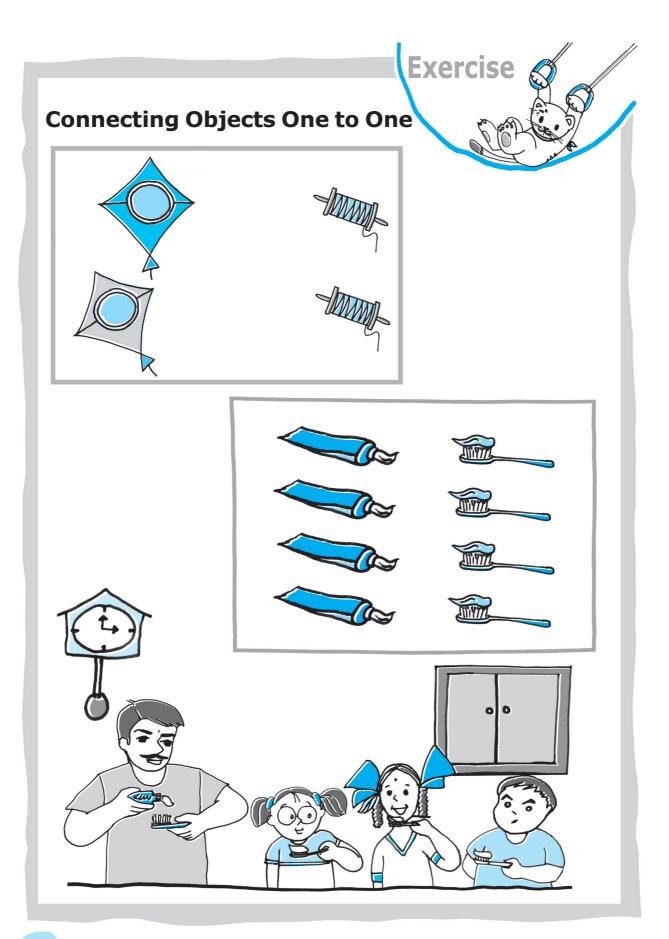




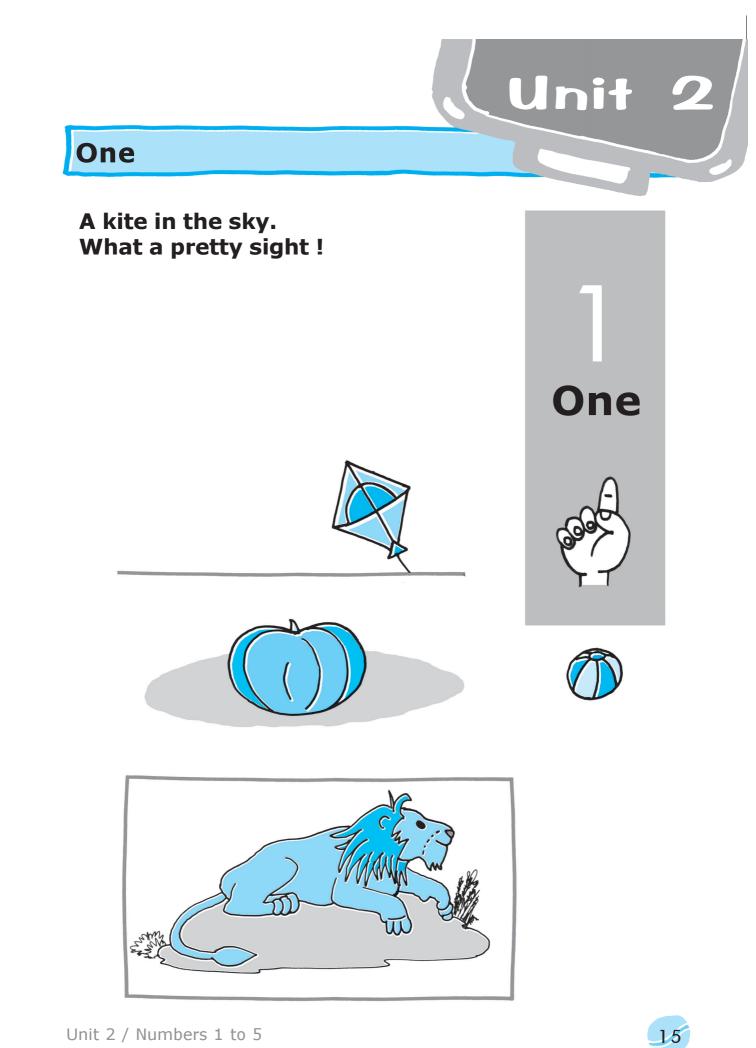








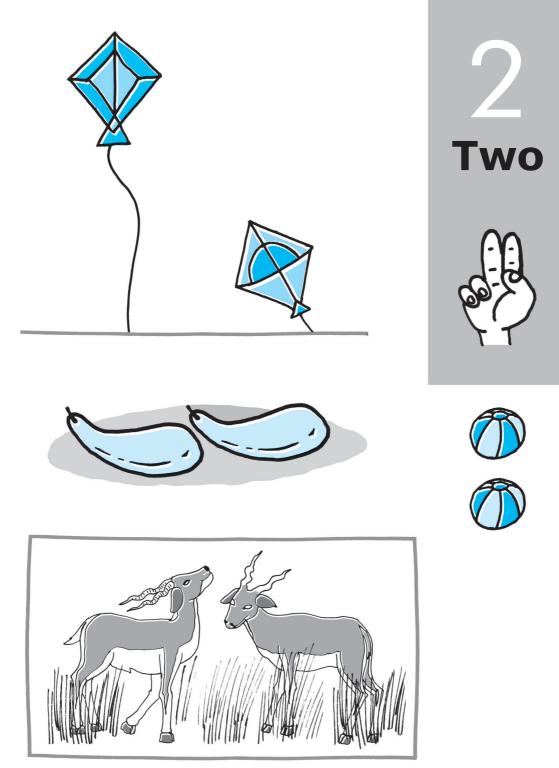
Unit 1 / Before we count



Unit 2 / Numbers 1 to 5

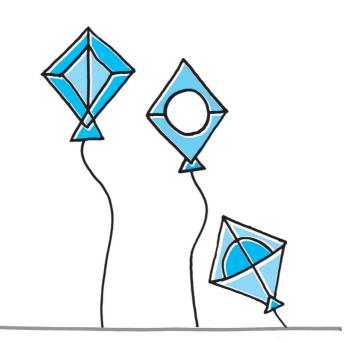
Two

And one more. Watch these two soar.



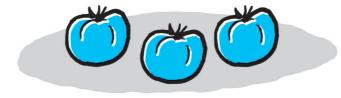
Three

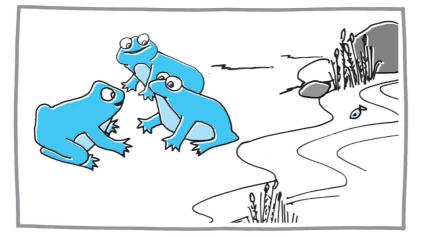
One more you can see. And that makes three.











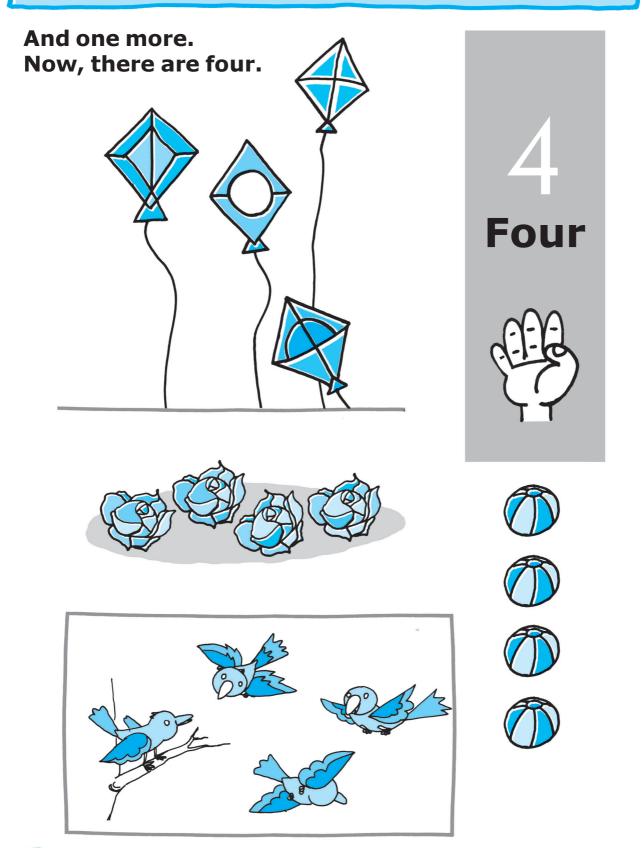




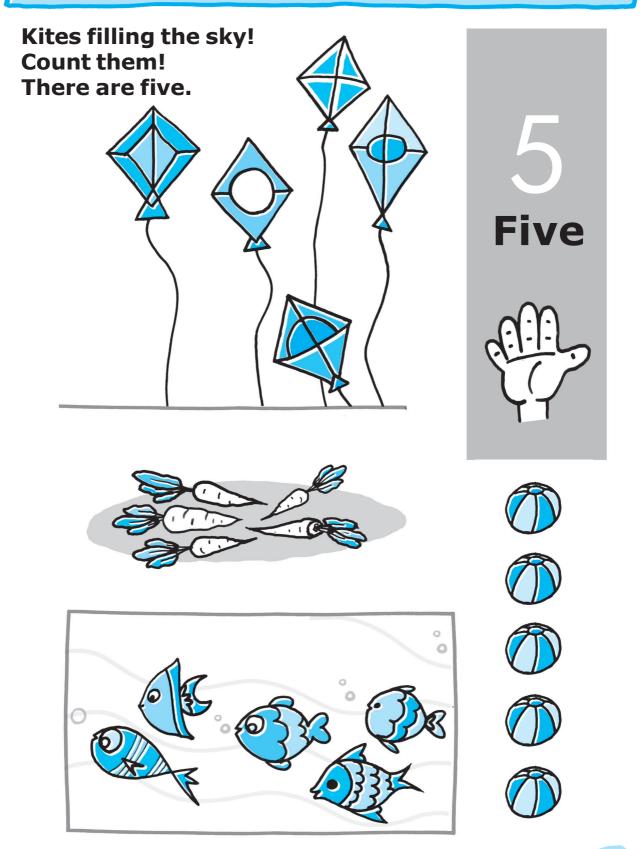


17

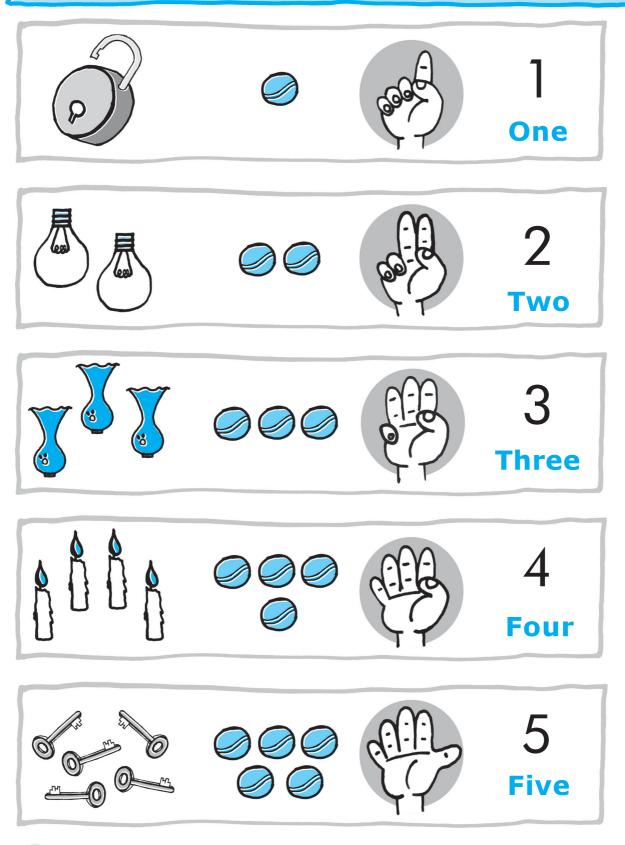
Four



Five

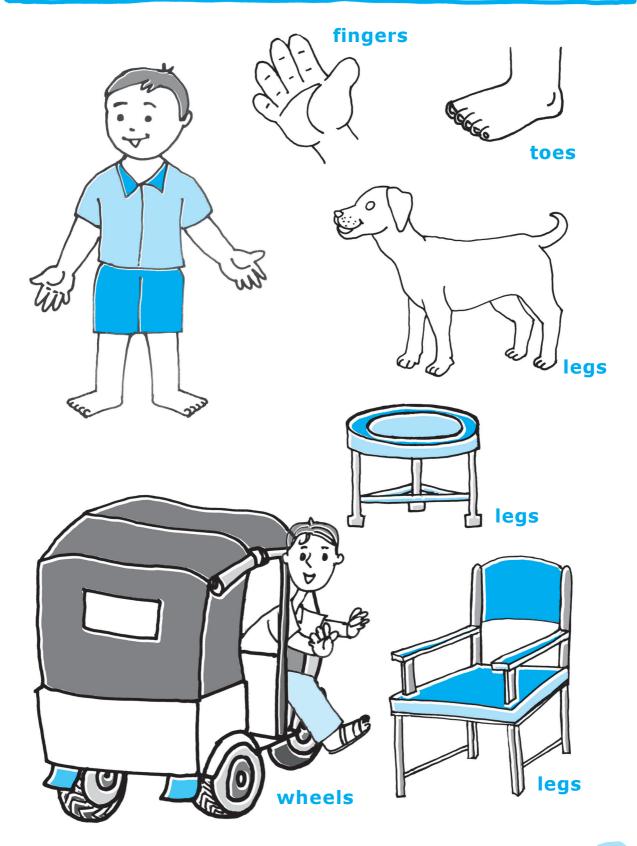


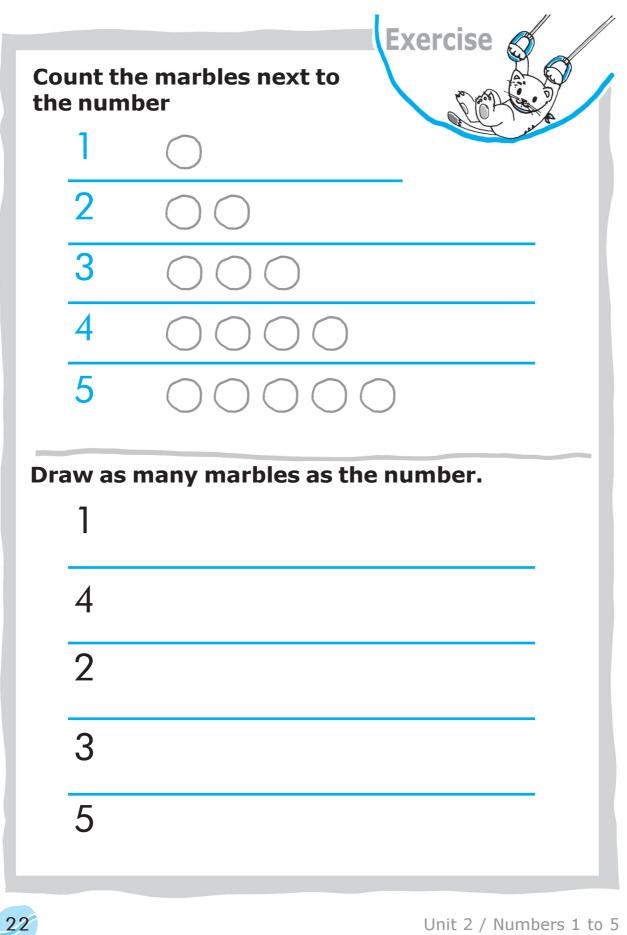
1 to 5

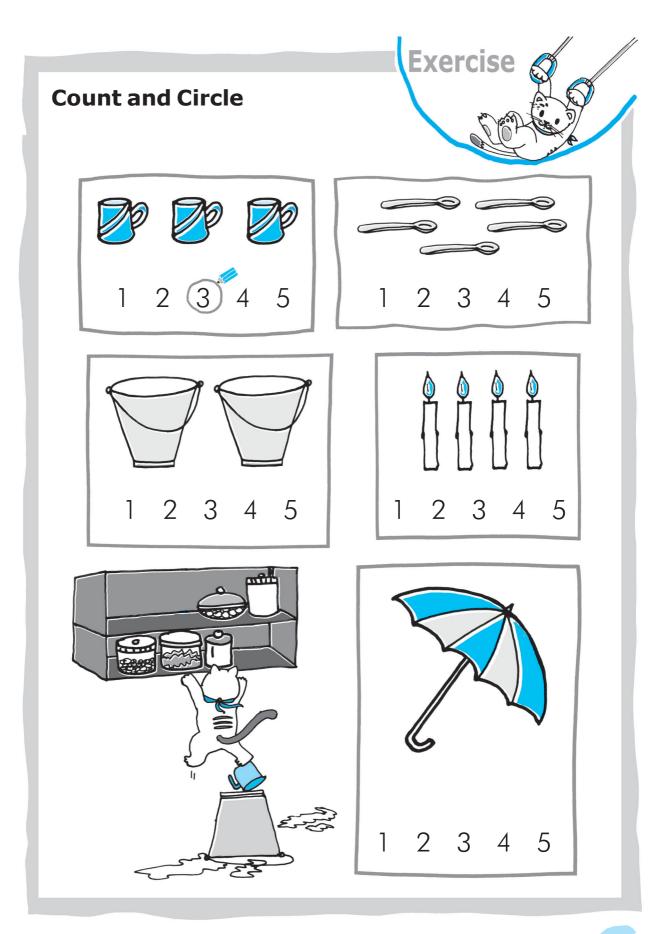


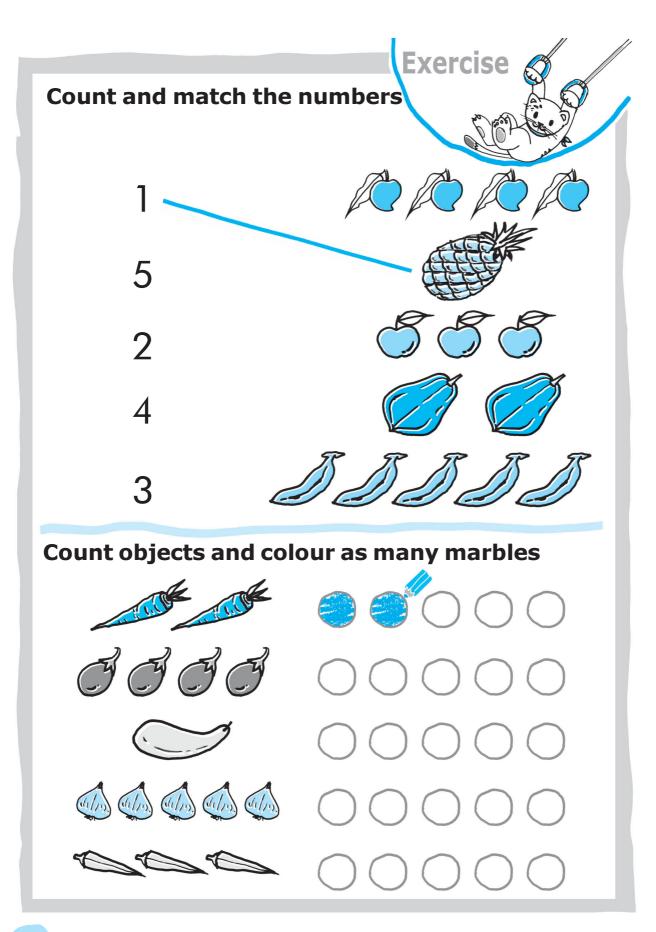


Count how many









Let us sing along!

One little kitten Went to the Zoo Along came another That made **Two** Two little kittens Climbed up a tree Along came another That made Three Three little kittens Looking for some more Along came another That made **Four** Four little kittens Calling for their mother Now they are **Five** And all are together.

Writing One

1	I		





Writing Two

2	2		





Writing Three

3	3		





Writing Four

4	Ч		



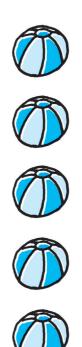




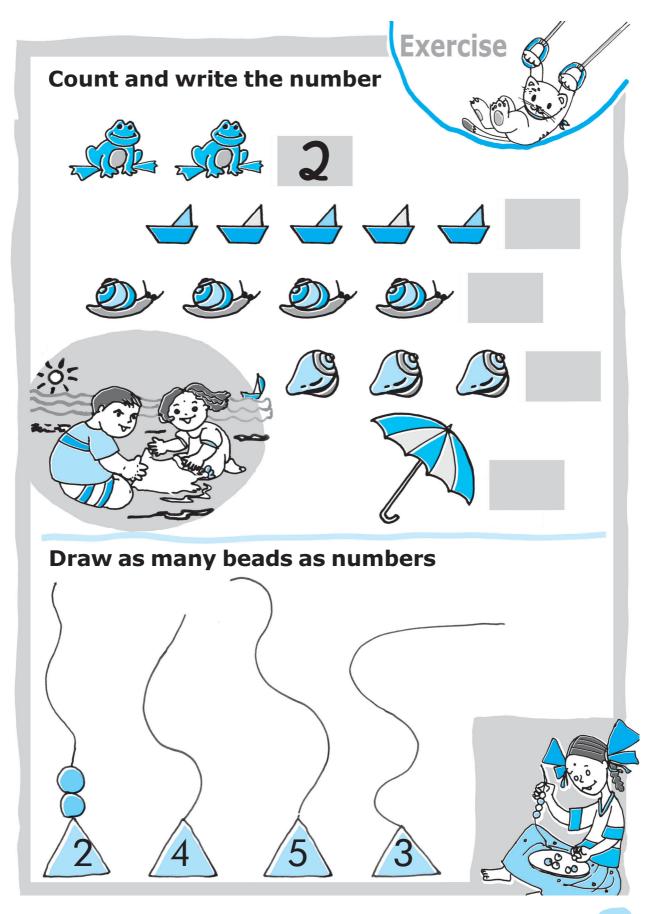


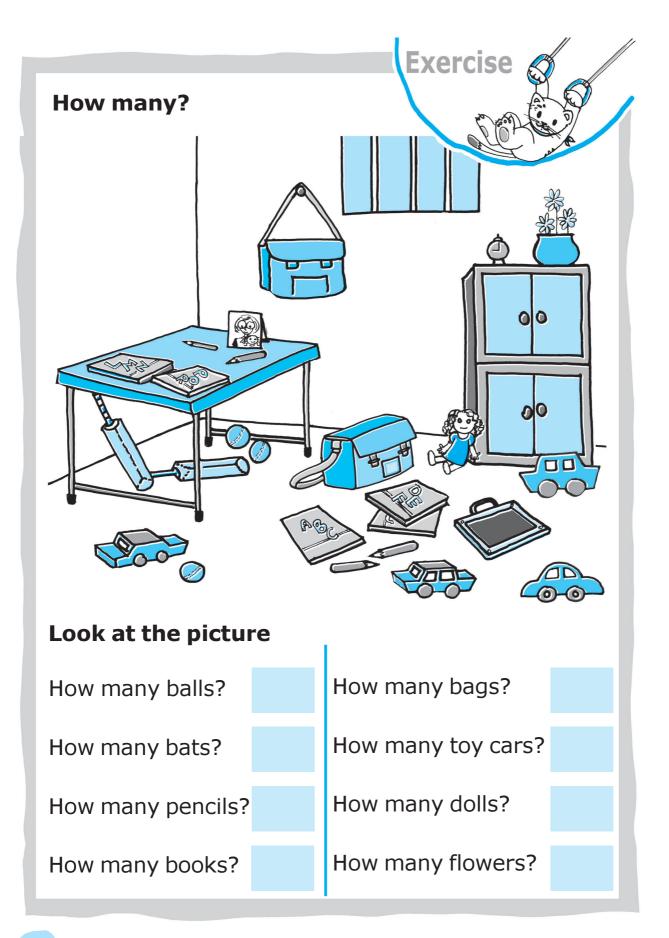
Writing Five

5	5		





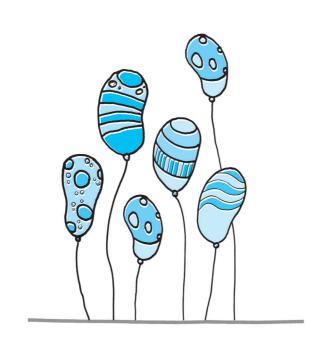


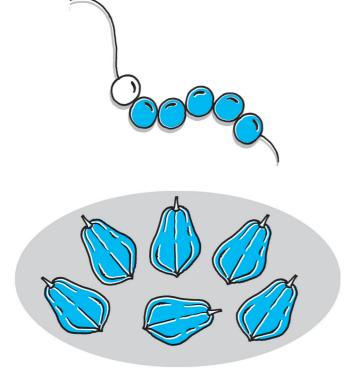




Six







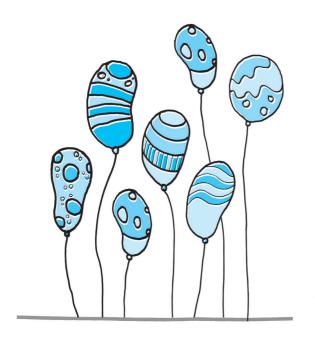


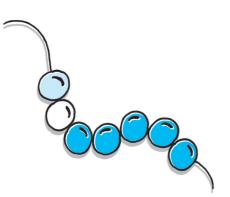


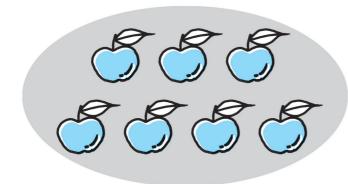


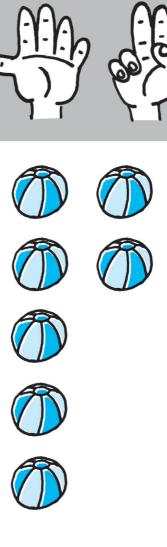
Unit 3 / Numbers 6 to 9

Seven



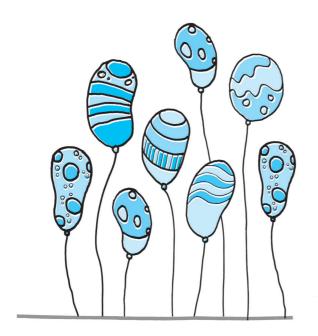


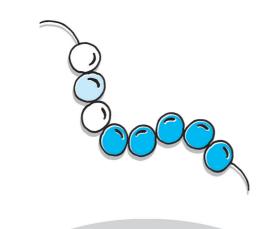


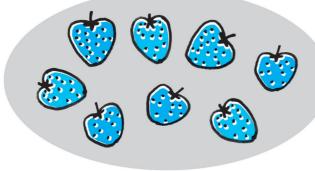


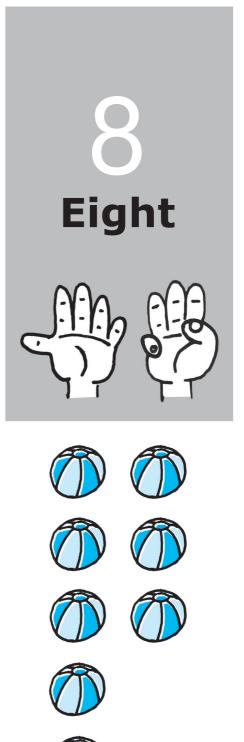
Seven

Eight



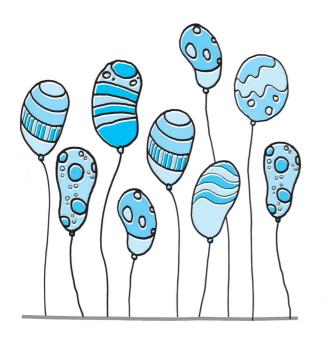


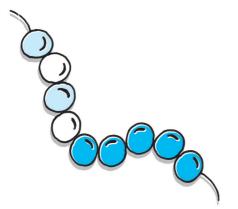


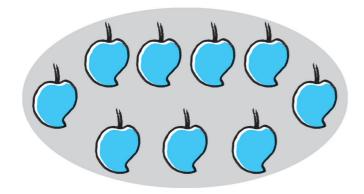


Unit 3 / Numbers 6 to 9

Nine

















Writing Six

6	6		



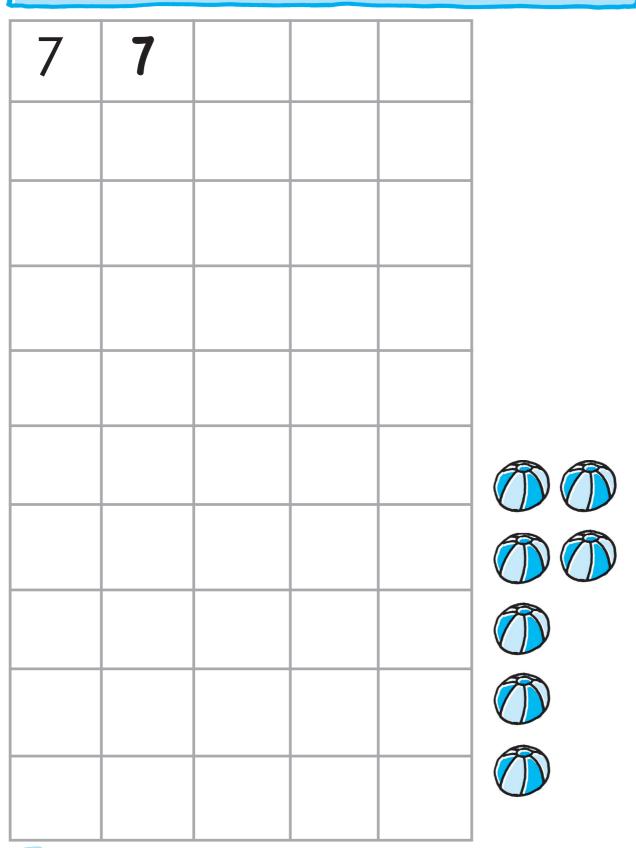






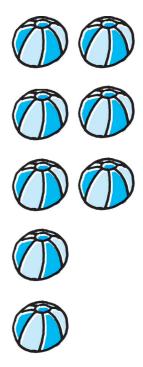
Unit 3 / Numbers 6 to 9

Writing Seven

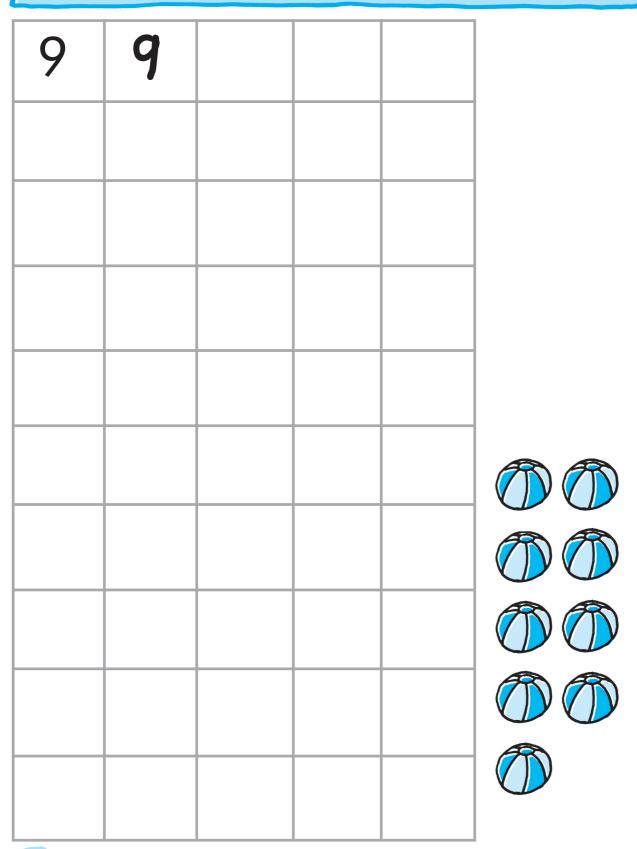


Writing Eight

8	8		

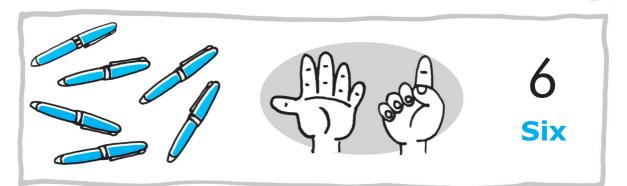


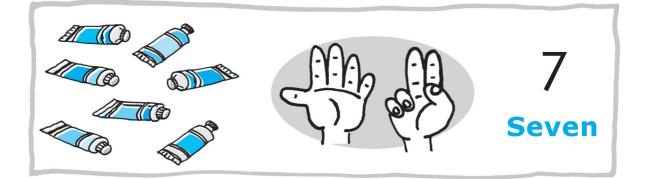
Writing Nine

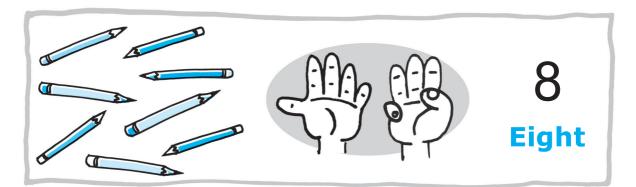


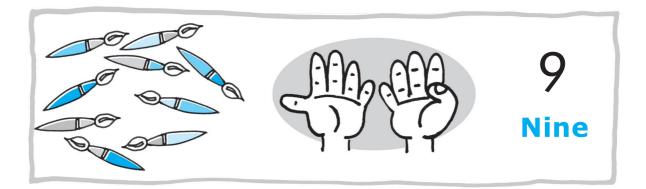


Six to nine



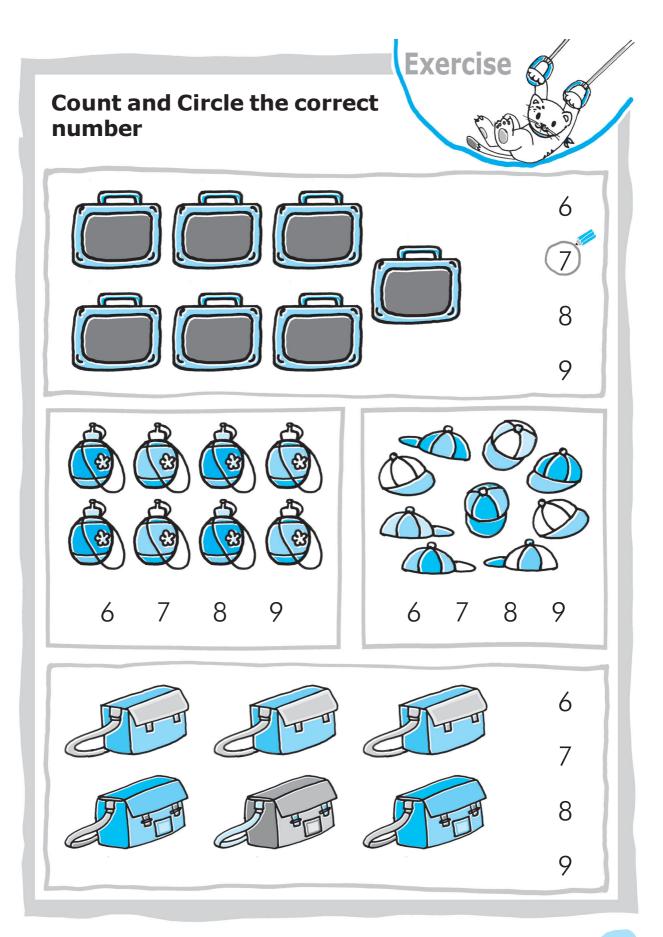




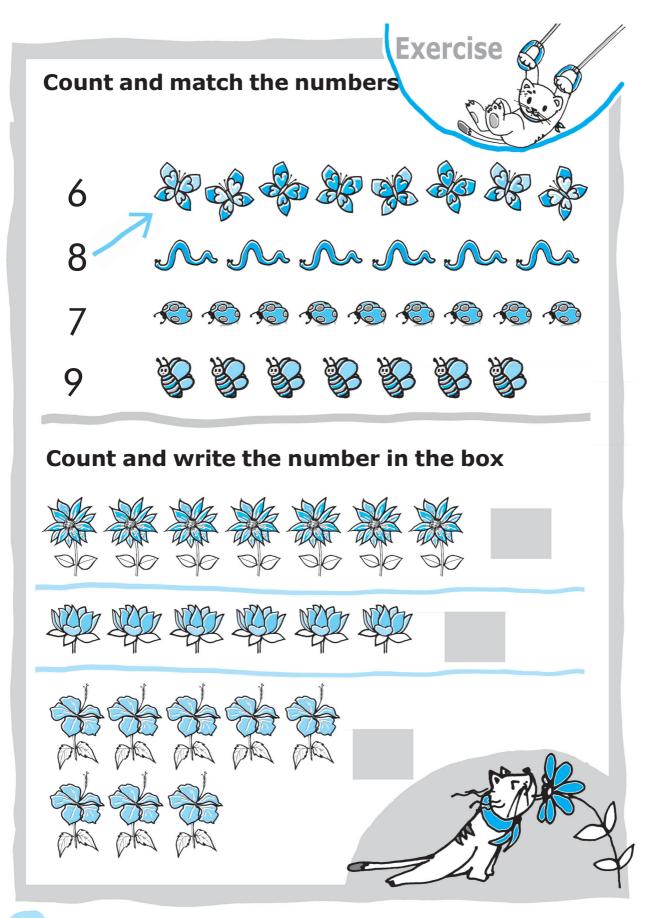


Count the marbles next to the number		
6		
7	000000	
8	0000000	
9	000000000	
Draw 9	as many marbles as the number	
7		
6		
8		





Unit 3 / Numbers 6 to 9



Unit 3 / Numbers 6 to 9

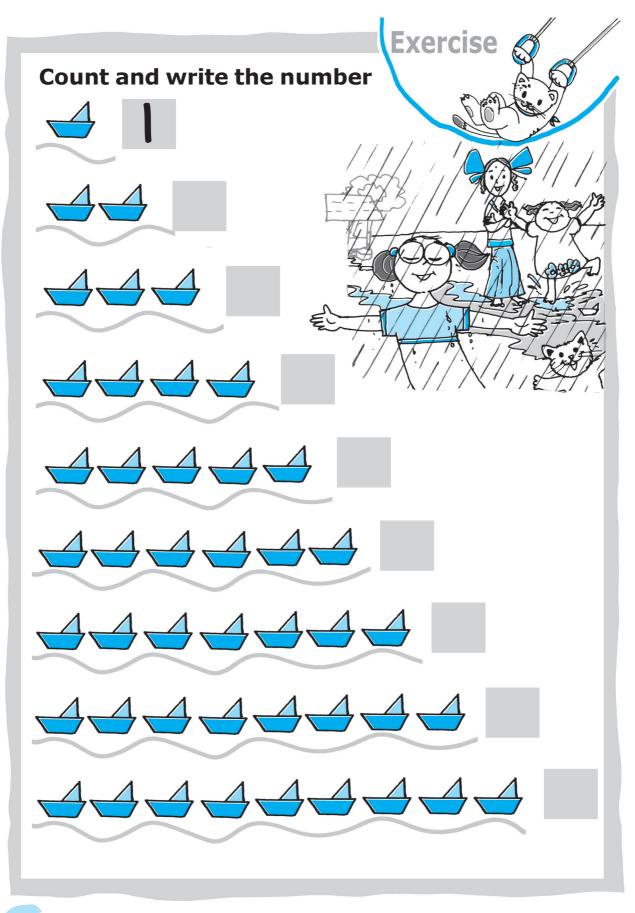
Rhyme

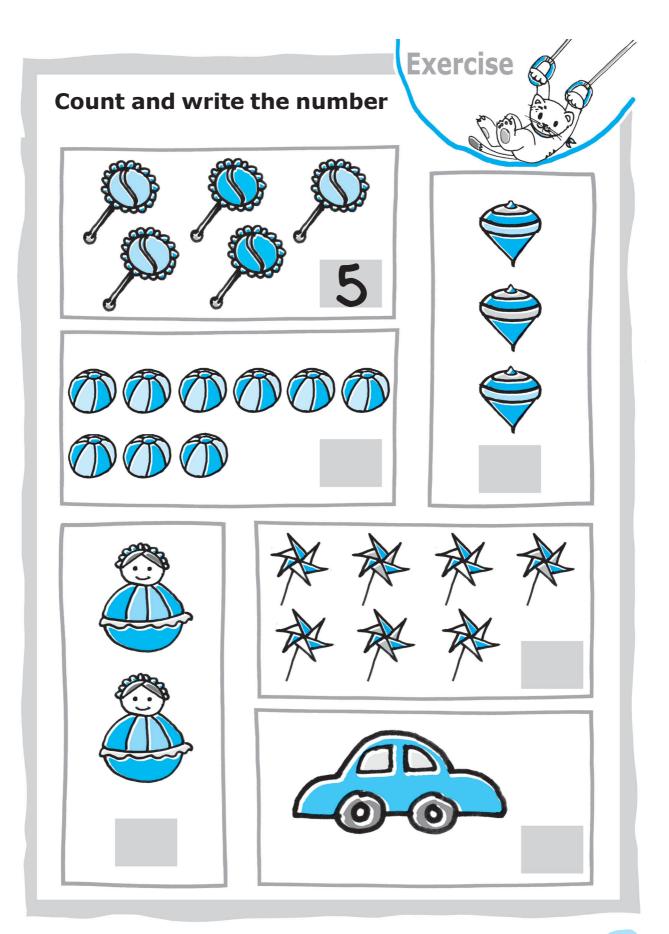
Start at the top and pull straight down to make number one Half around and push straight back to make the number two Half around and half around to make the number three Down, across and then straight down to make the number four Down, around and then the top to make the number five Make a curve and close it up to make the number six Make a push and then a slant to make the number seven Make an "s" and close it up to make the number eight Make a ball and then a stick to make the number nine

Unit 3 / Numbers 6 to 9

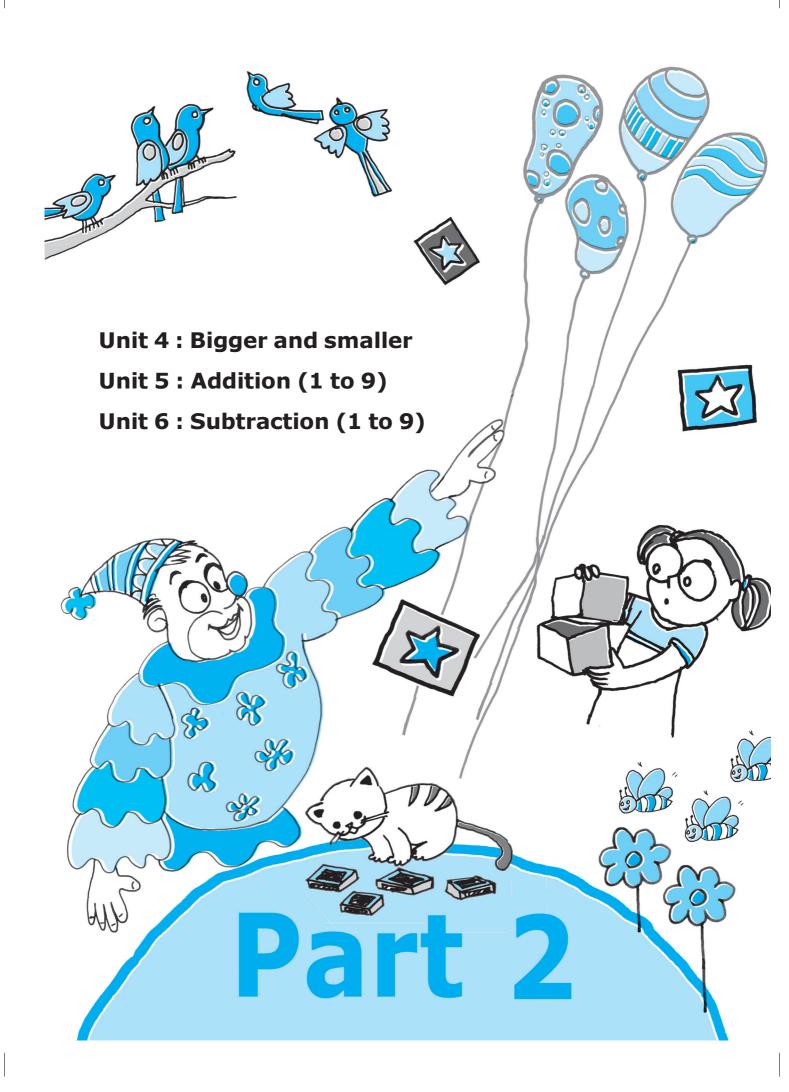
6

~1



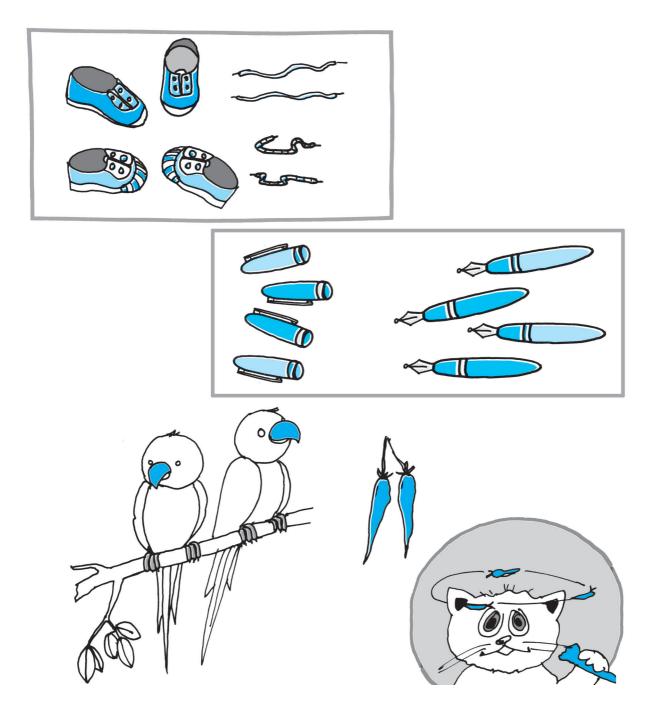




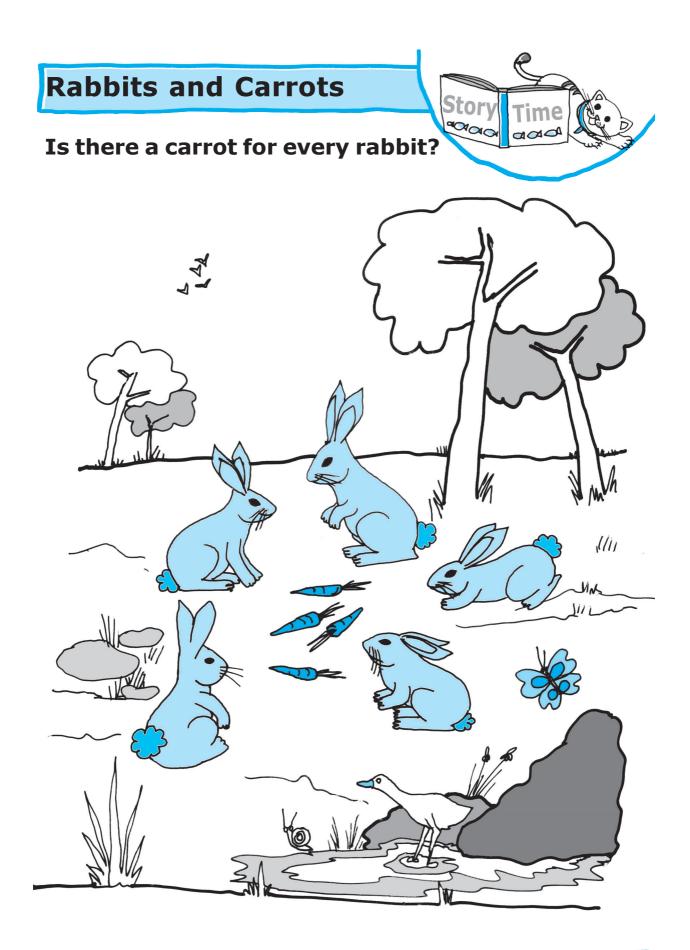


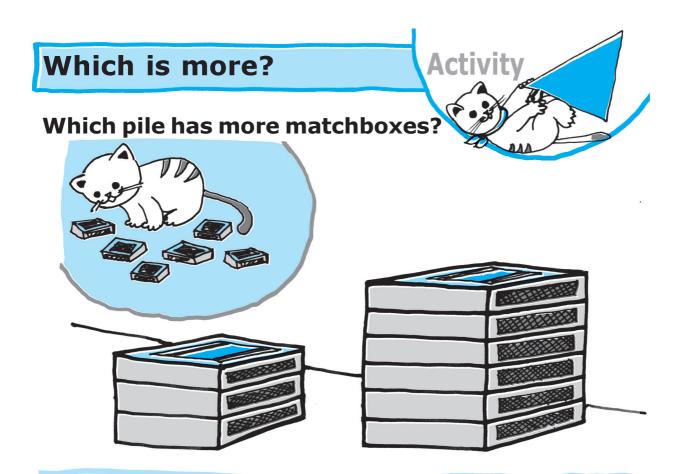
Unit 4

As many as...

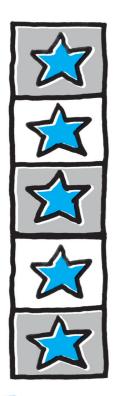








Which strip has more stars?



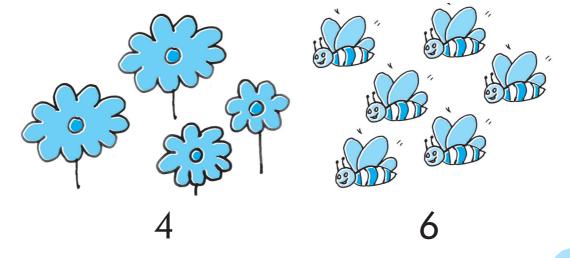




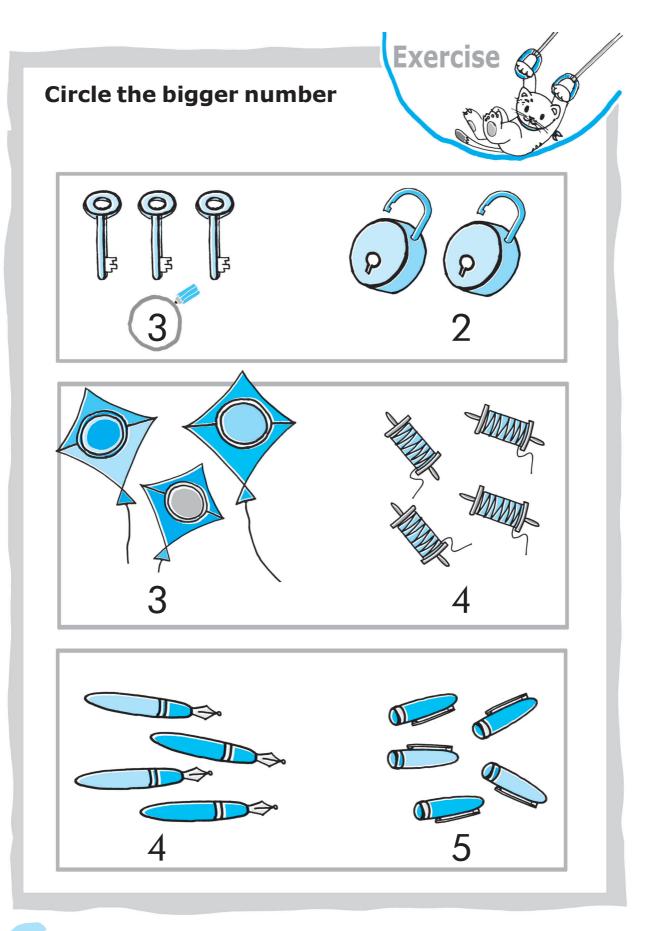
Unit 4 / Bigger and smaller



Flowers or bees?



Unit 4 / Bigger and smaller

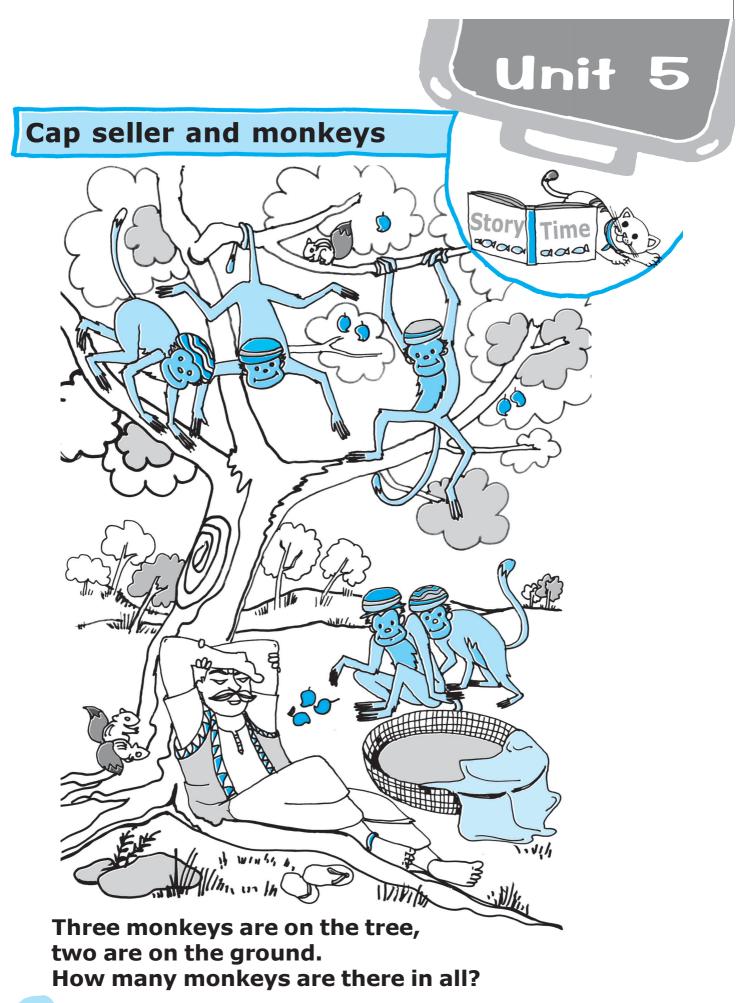


Unit 4 / Bigger and smaller

54



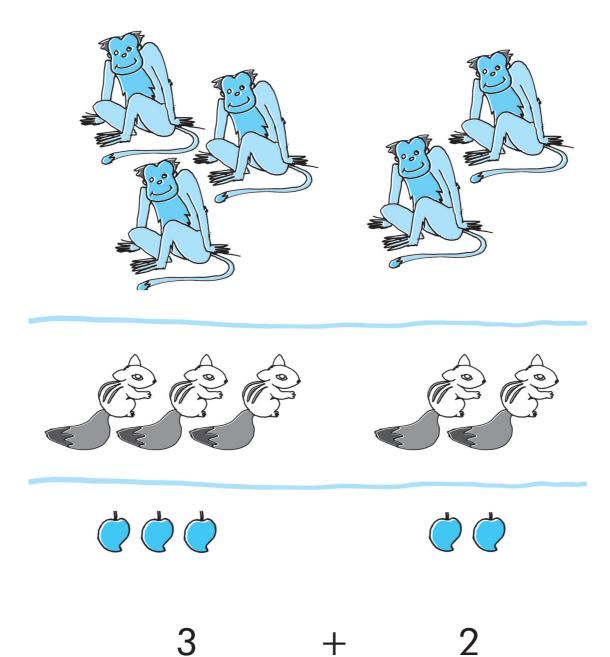
Unit 4 / Bigger and smaller



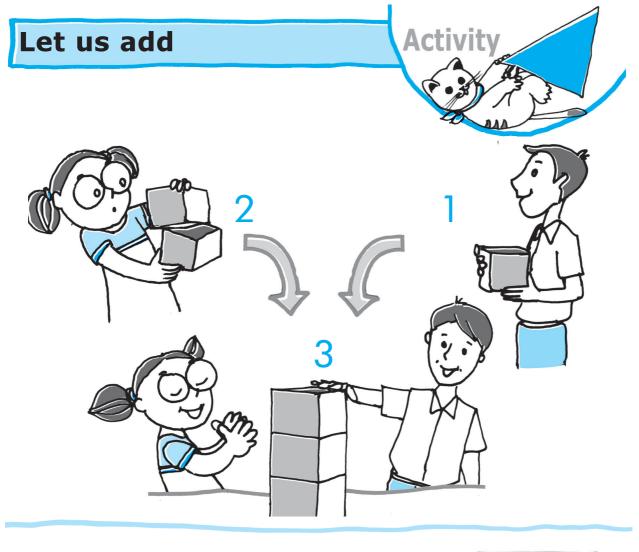


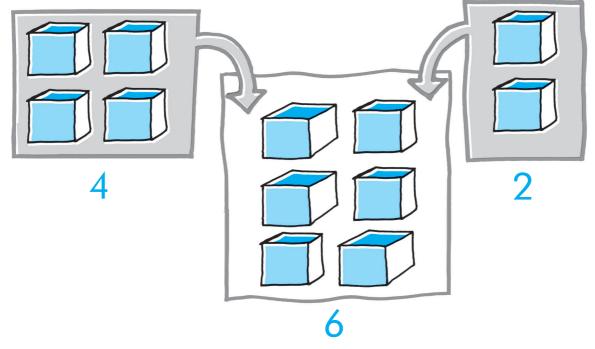
How many in all?

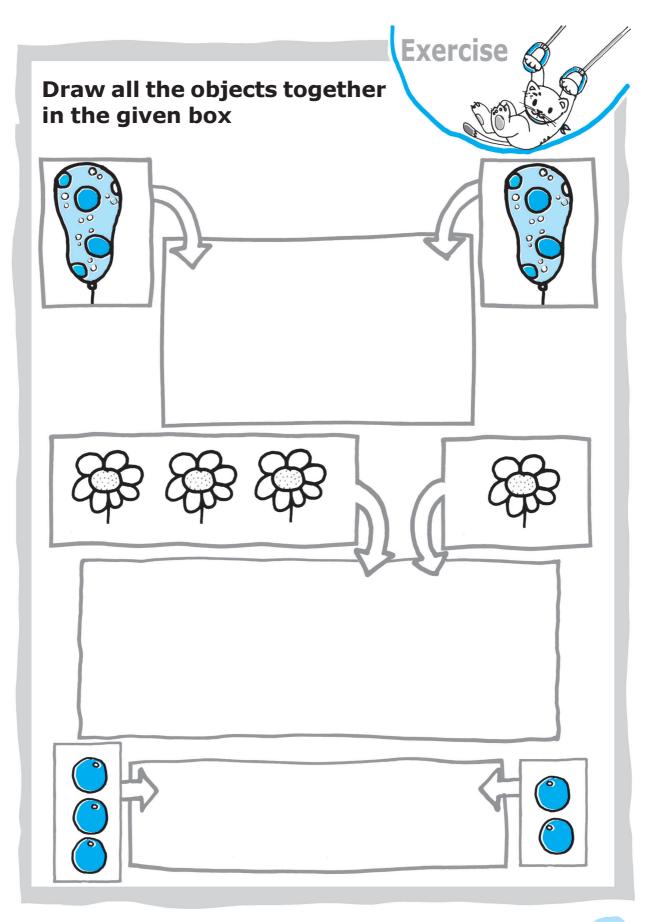




+

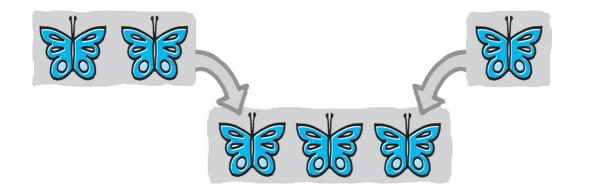


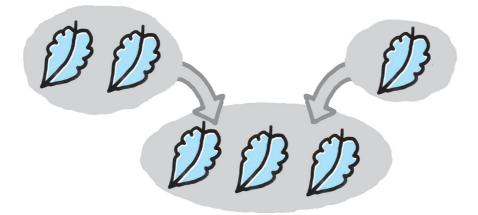


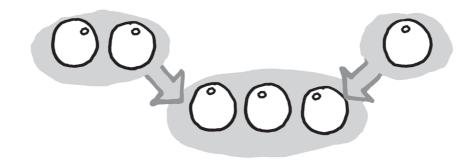


Unit 5 / Addition (1 to 9)

Let us add



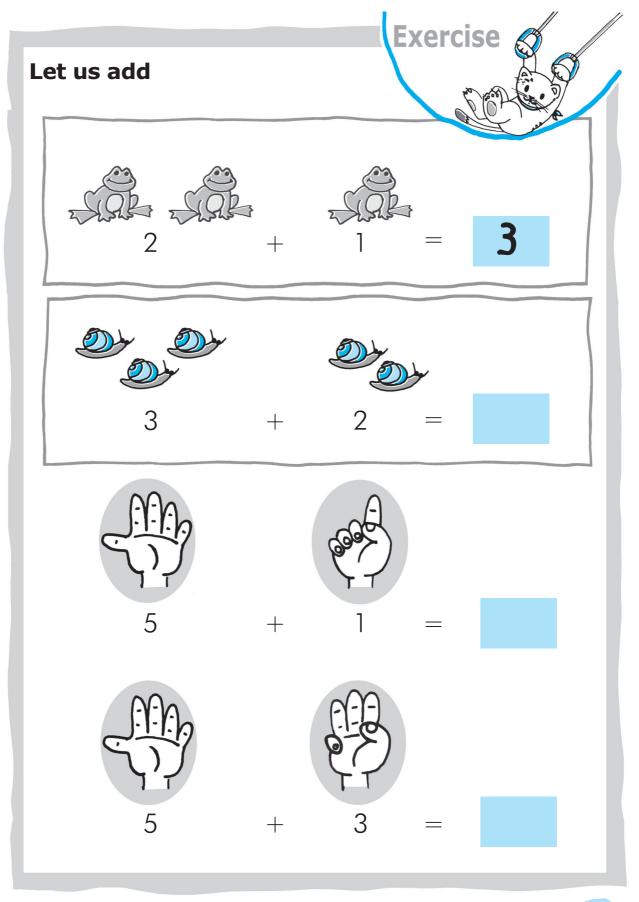




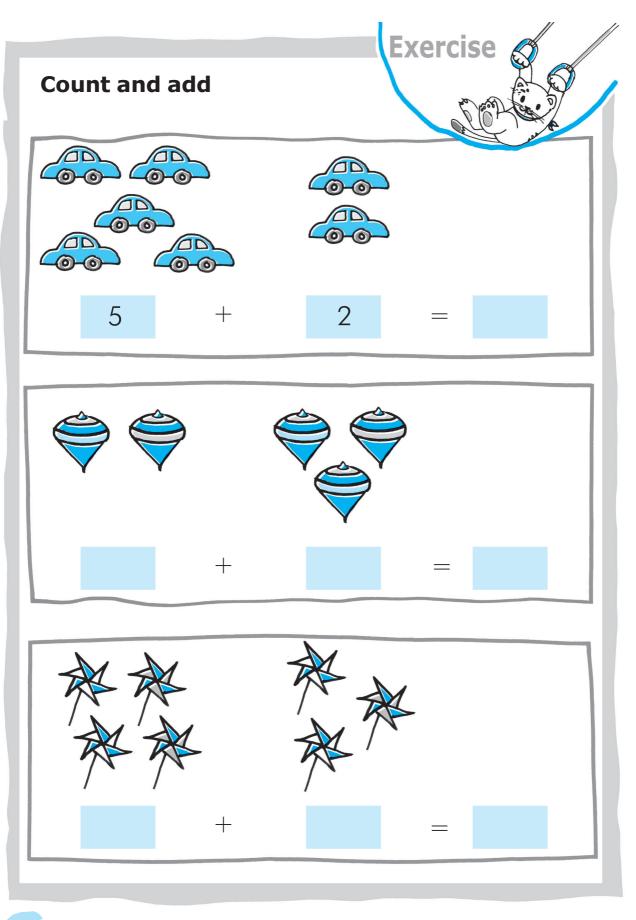
2 + 1 = 3

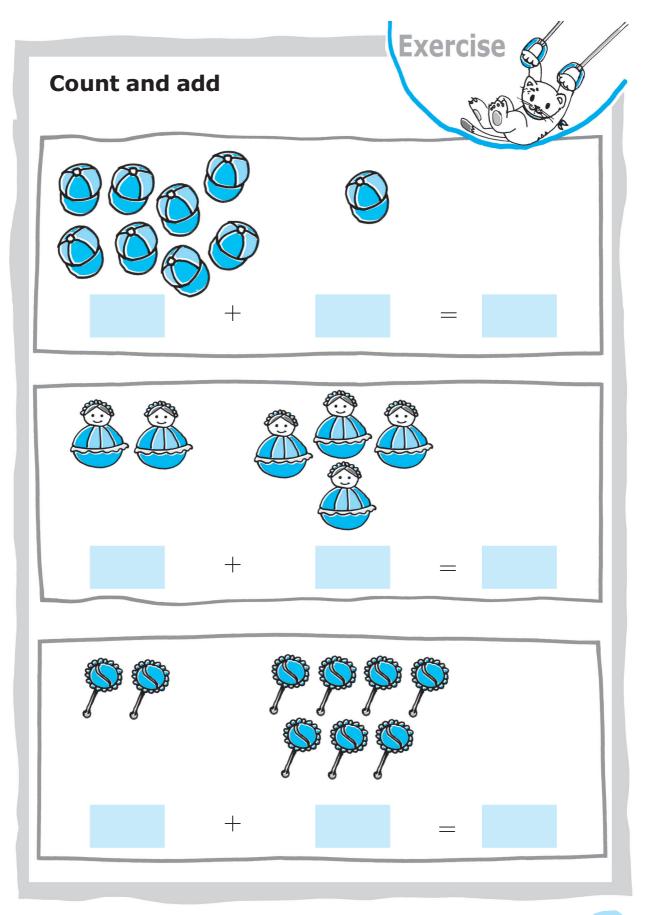


Unit 5 / Addition (1 to 9)



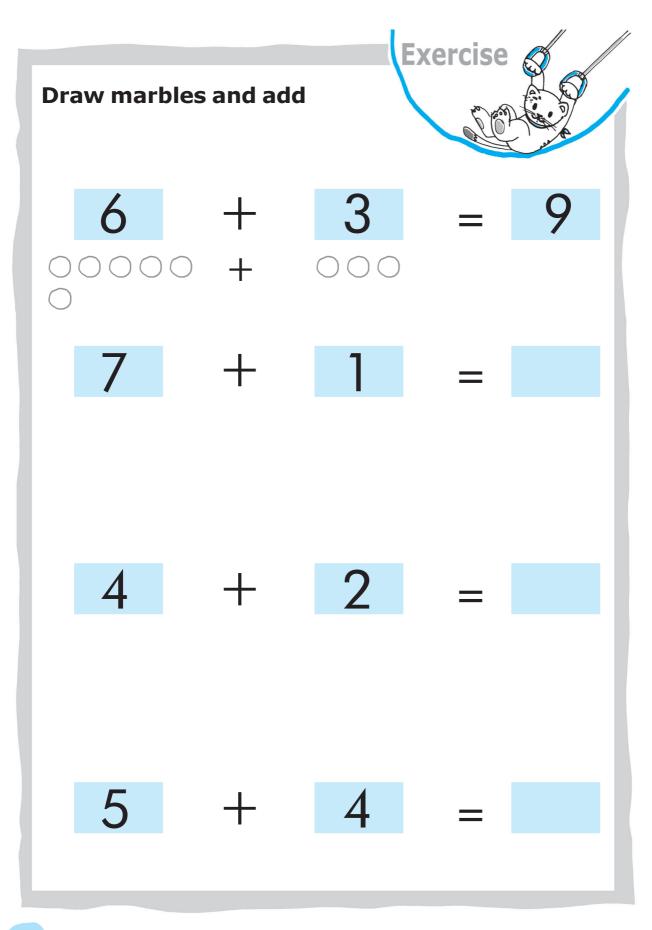
Unit 5 / Addition (1 to 9)





Unit 5 / Addition (1 to 9)

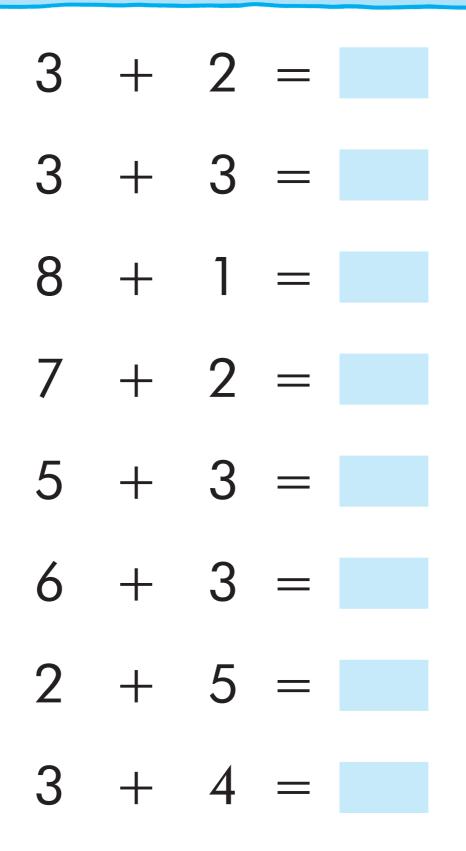
63

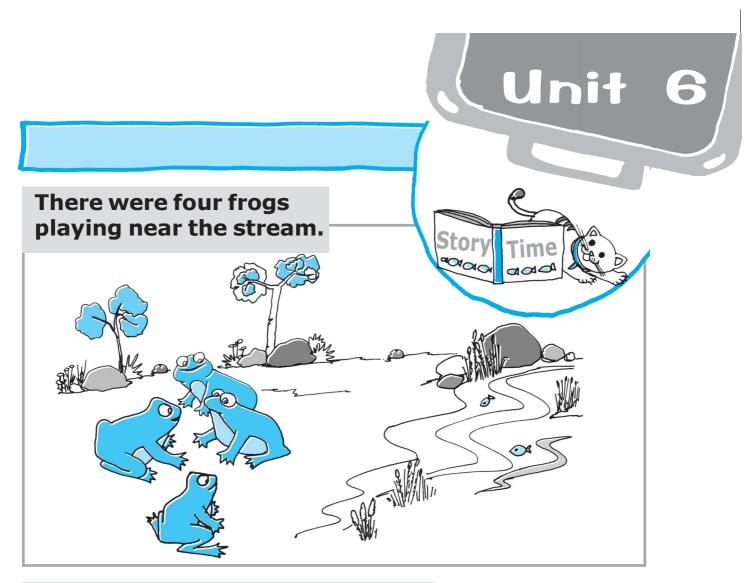


Unit 5 / Addition (1 to 9)

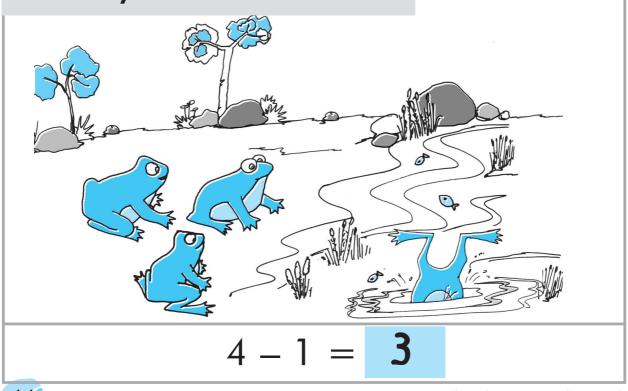
64

Sums

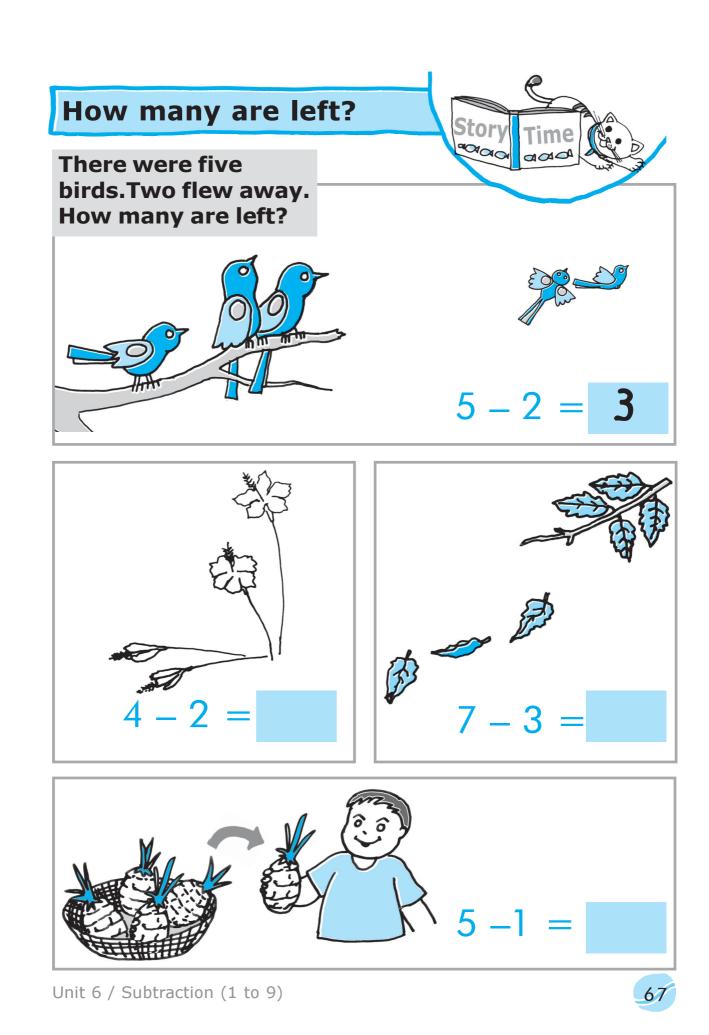




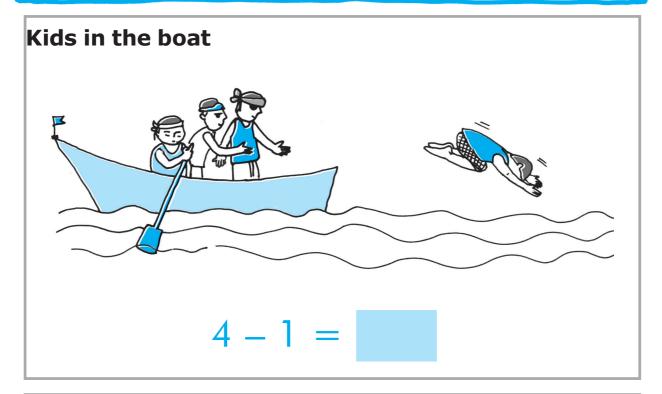
One frog jumped into the stream. How many are left?

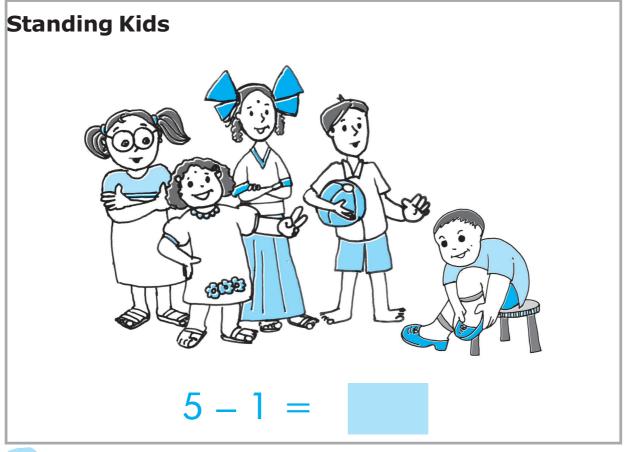


Unit 6 / Subtraction (1 to 9)

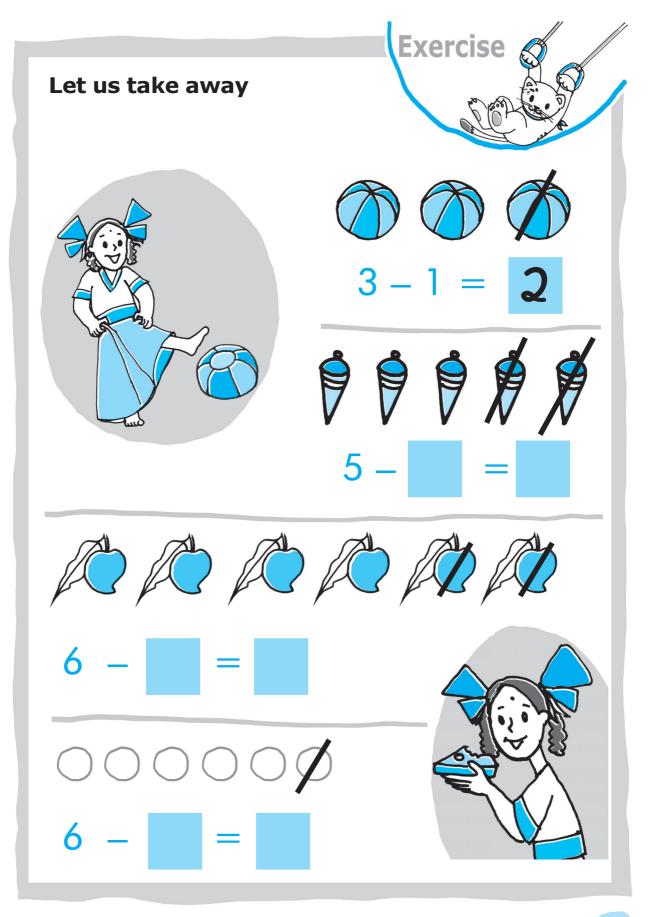


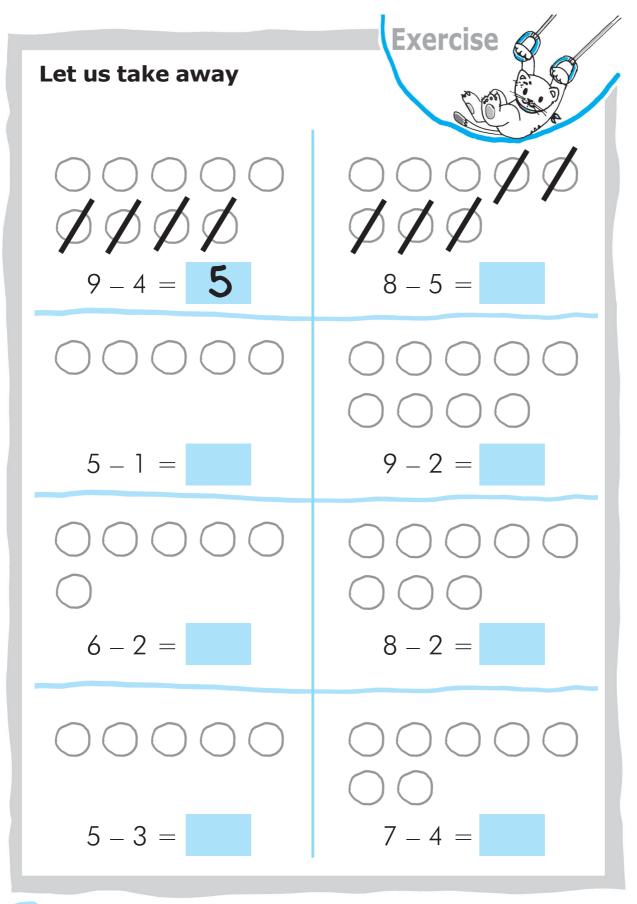
How many are left?

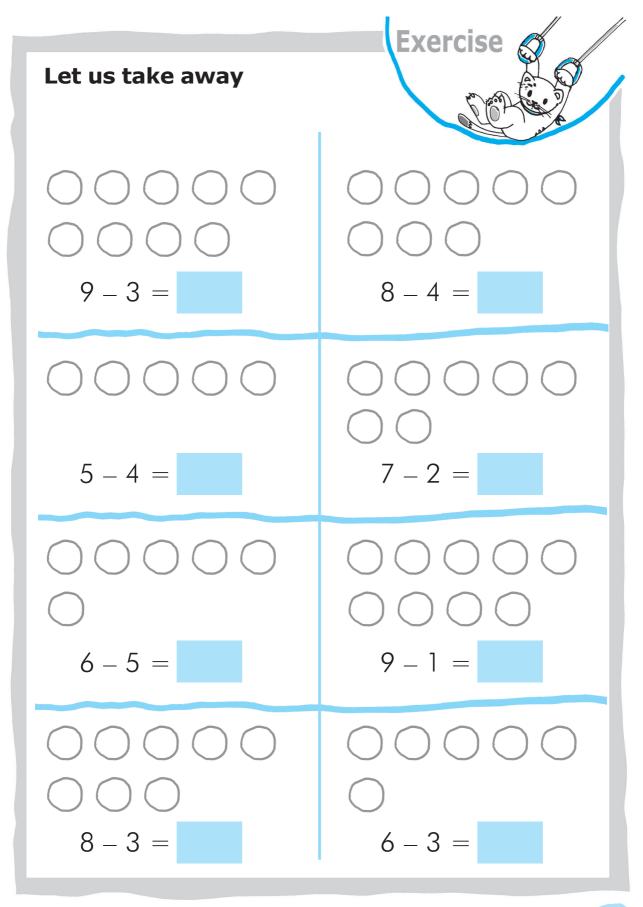


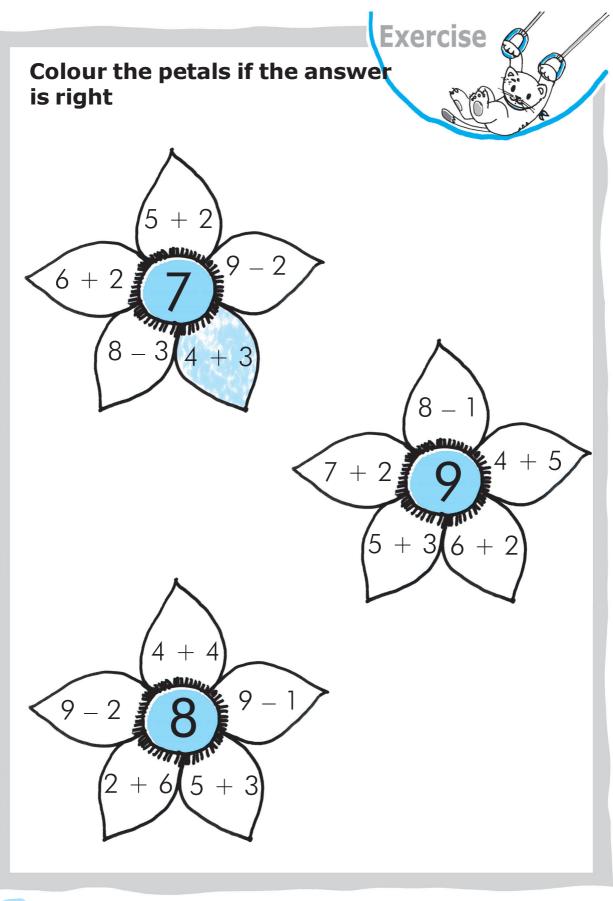


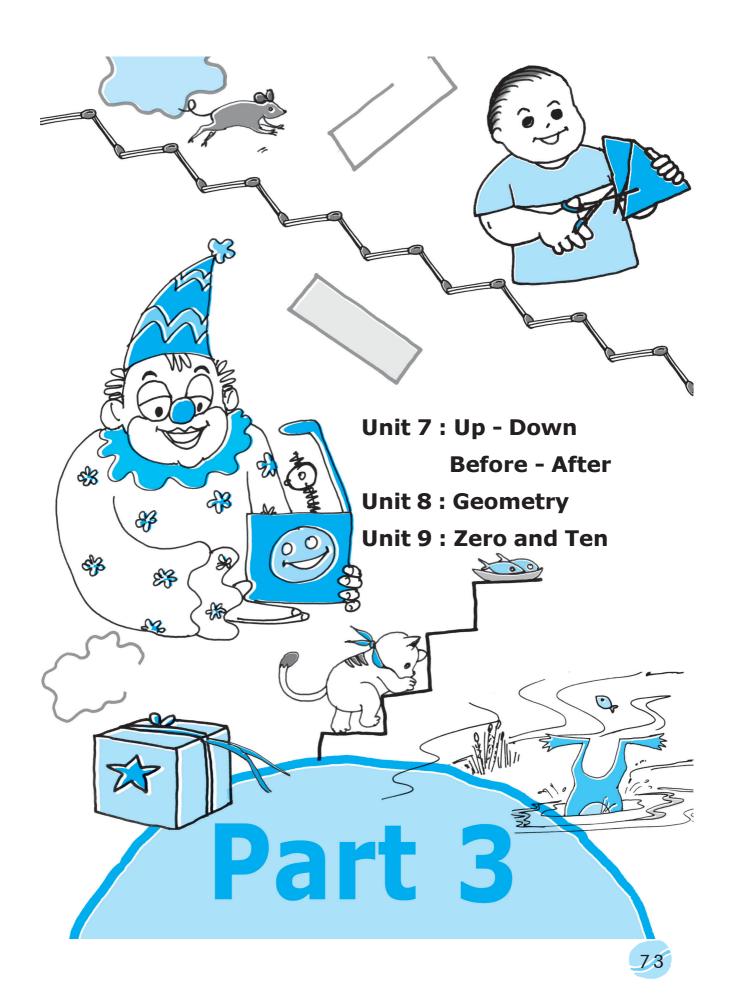
Unit 6 / Subtraction (1 to 9)





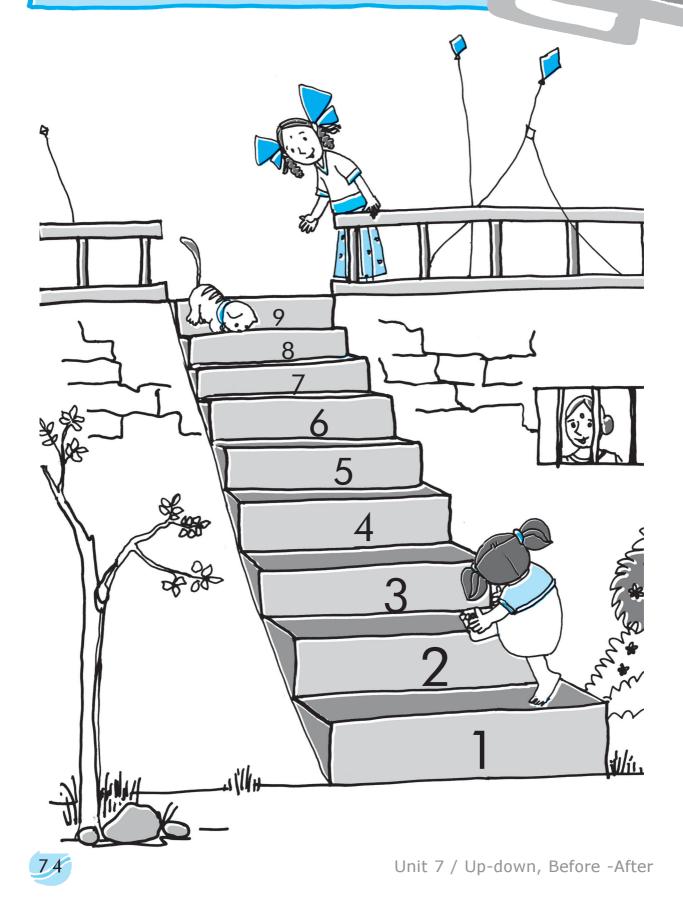






Unit 7

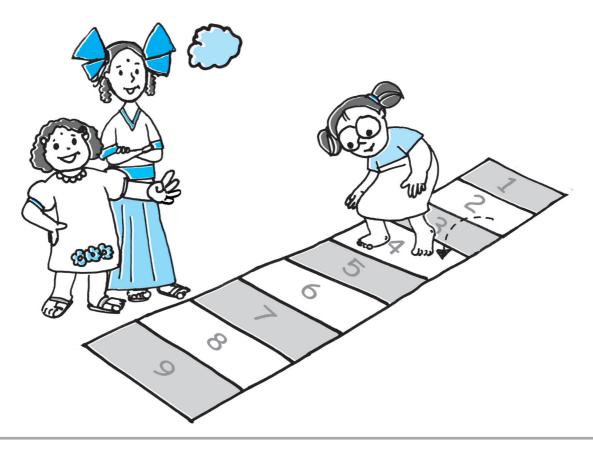
Count Up and Down





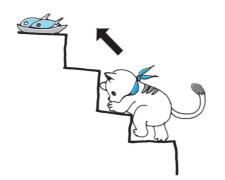


Call out a number and tell your friend to hop on that number.

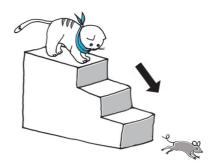


Count up / Count Down

Count up from 6 upto 9 Count up from 4 upto 8

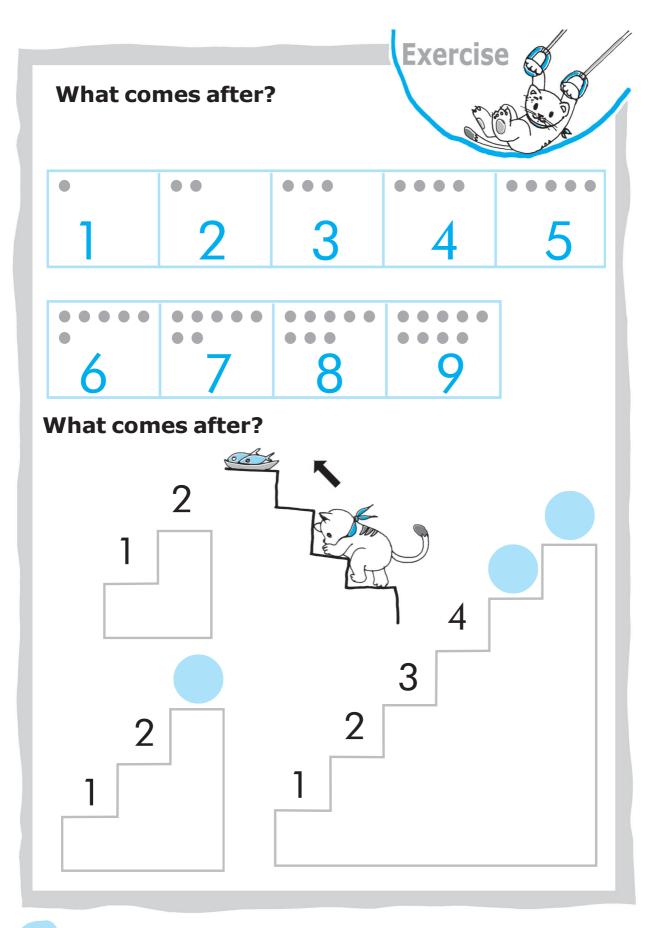


Unit 7 / Up -down, Before-After

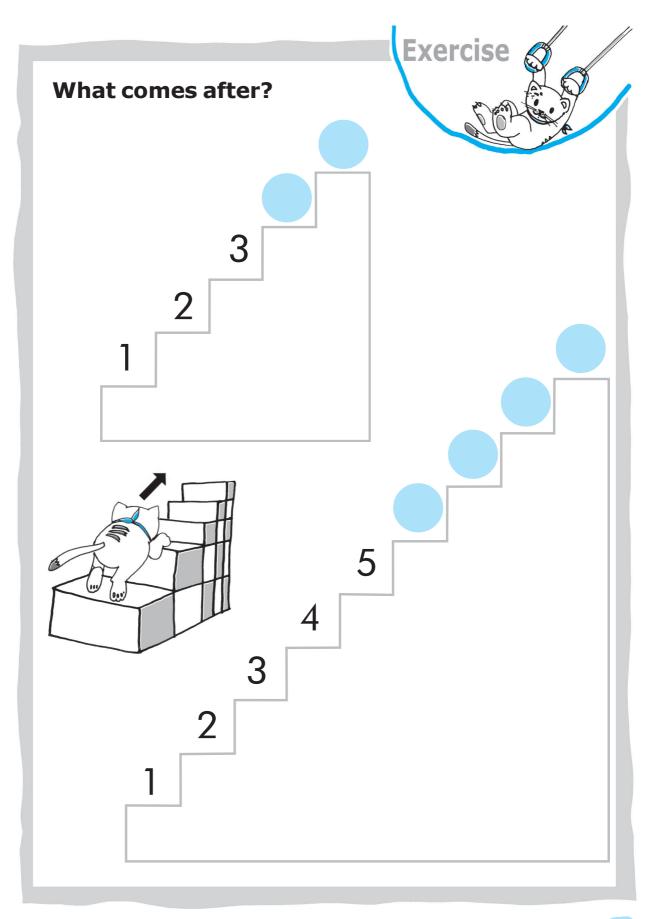


Count down from 6 to 9 Count down from 4 to 8

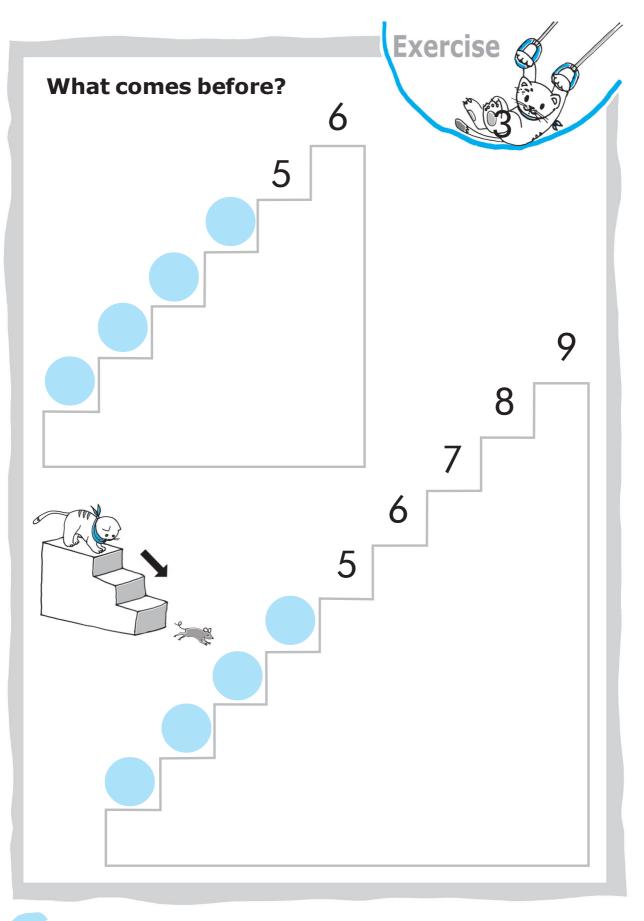


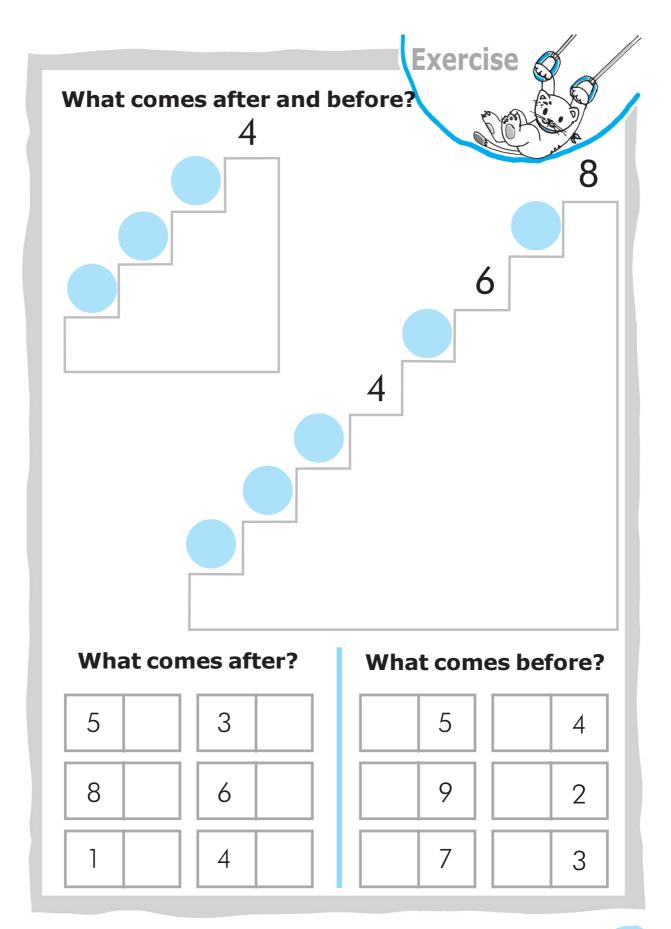




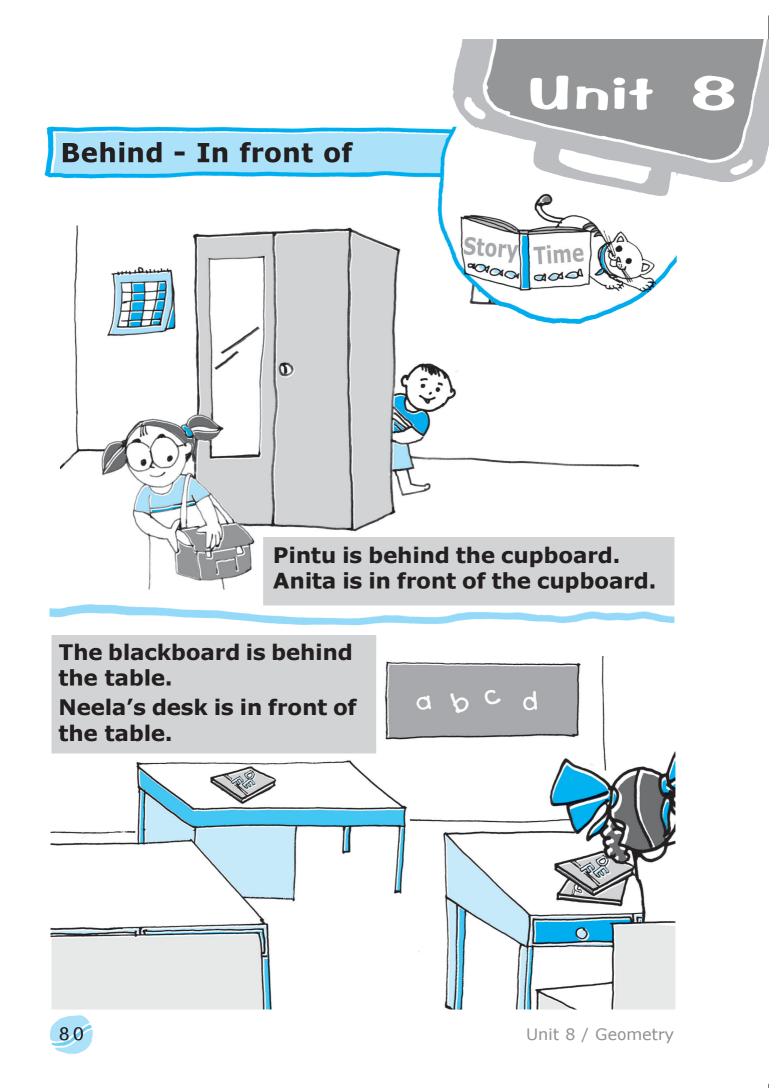


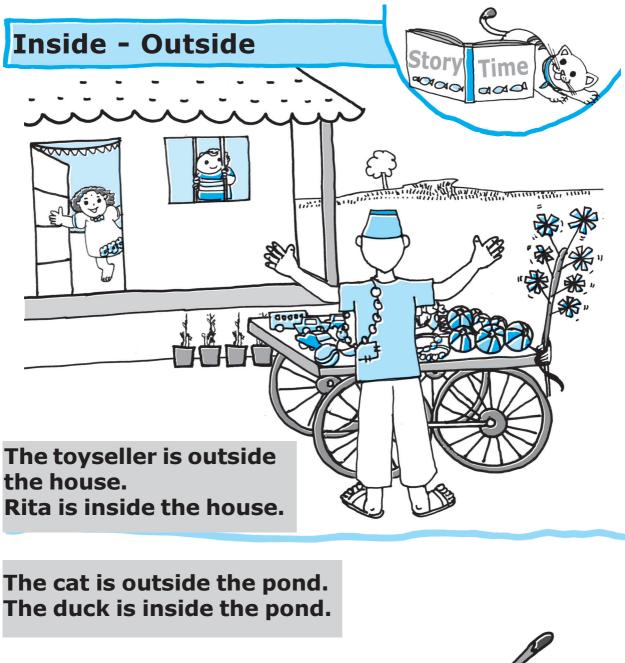
Unit 7 / Up -down, Before-After

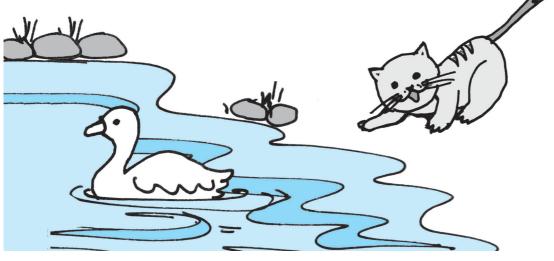


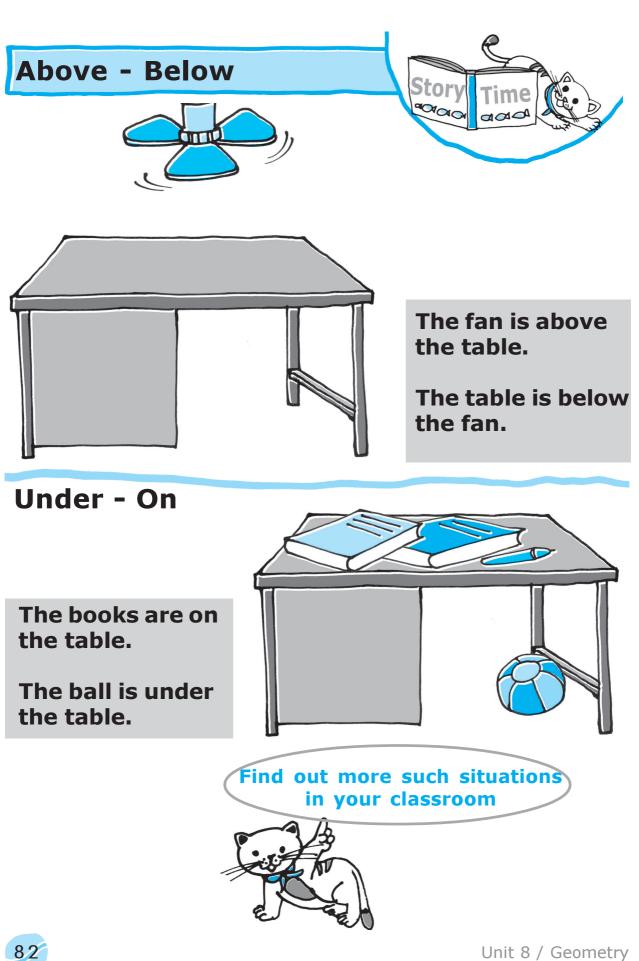


Unit 7 / Up -down, Before-After









Unit 8 / Geometry

Open and Closed





Open Door



Open shape





Closed Door



Closed shape

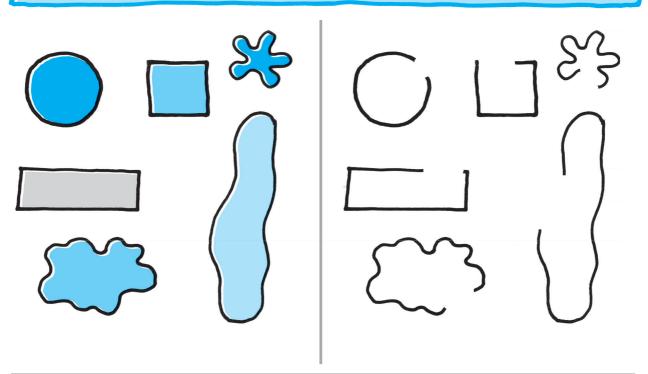


Open shape

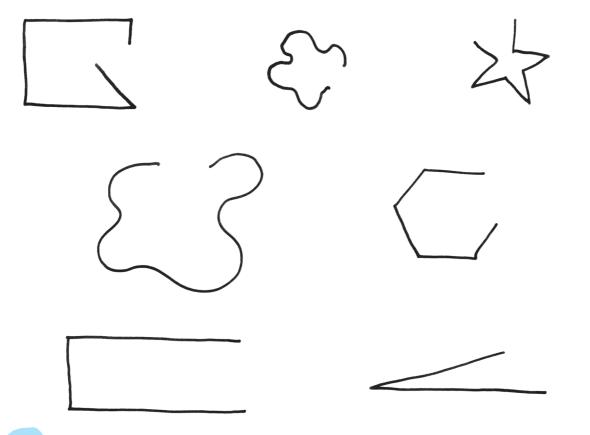


Closed shape

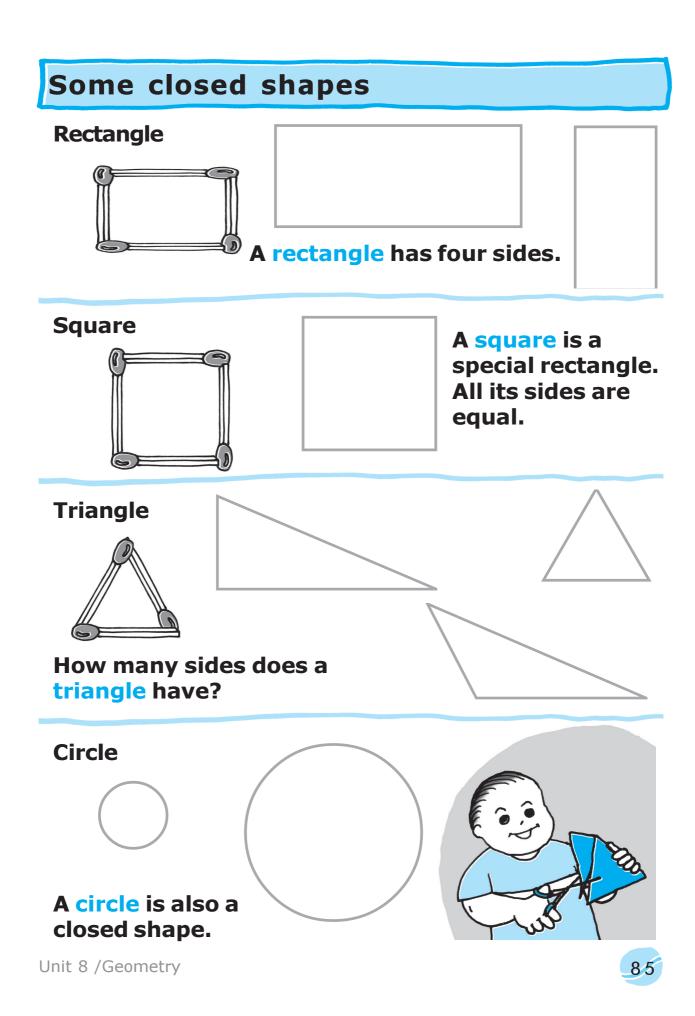
Closed - Open

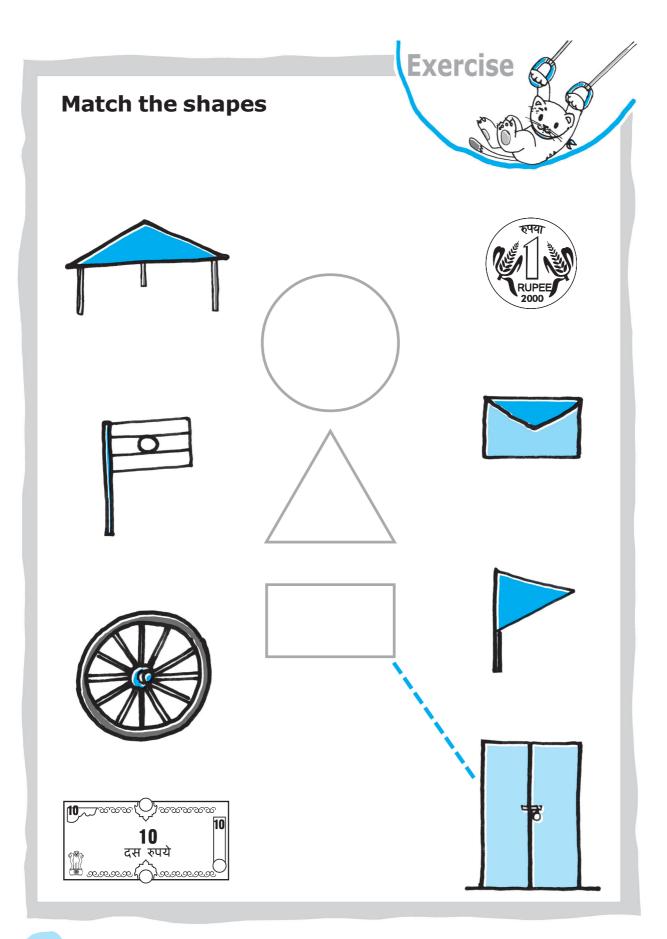


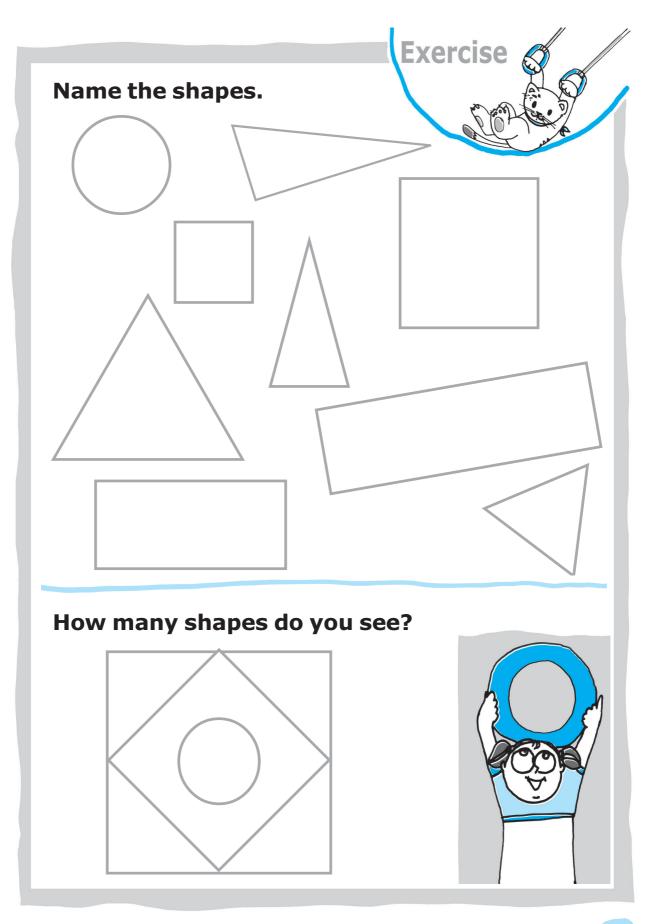
Close the open shape.



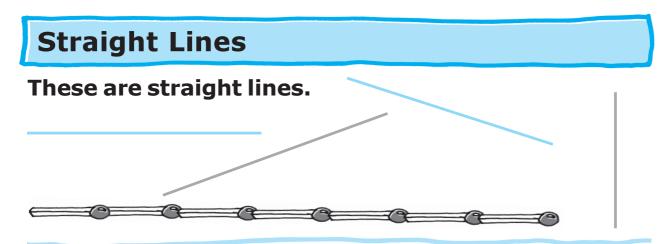
Unit 8 / Geometry





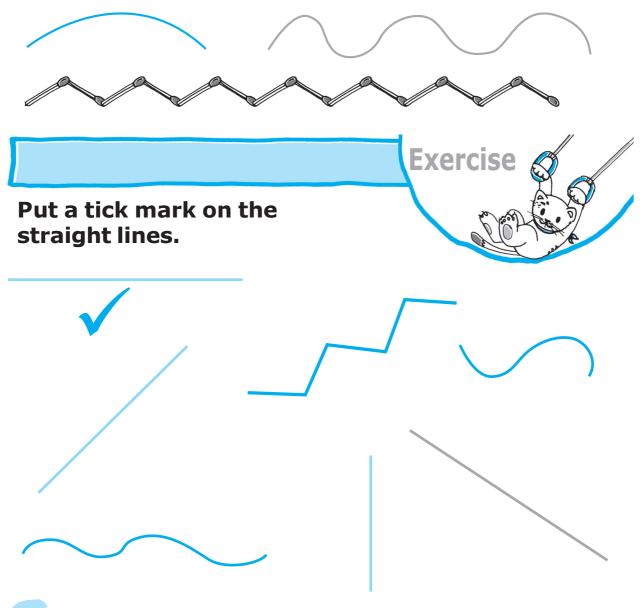


Unit 8 /Geometry

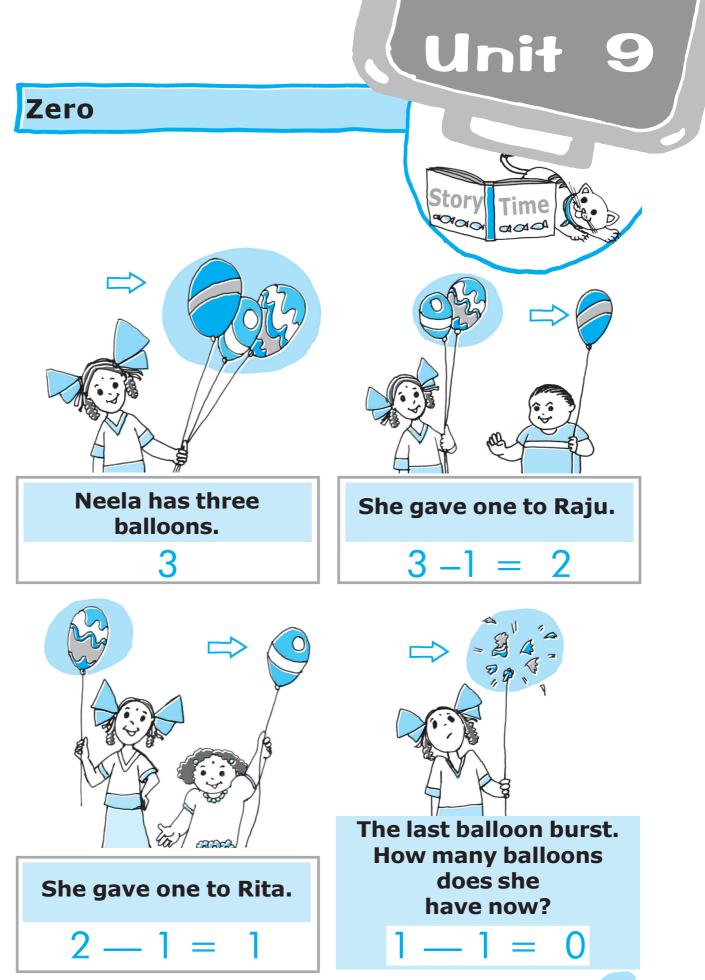


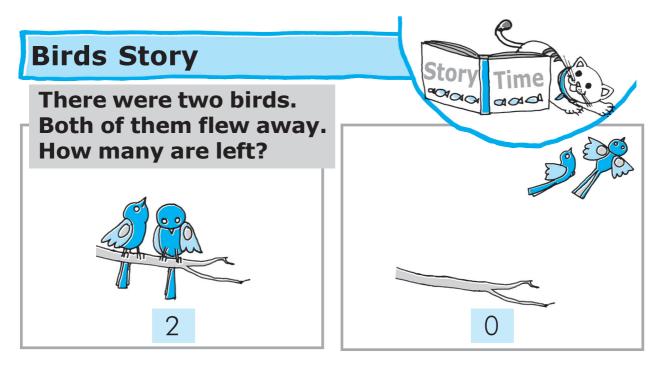
These are not straight lines.

88

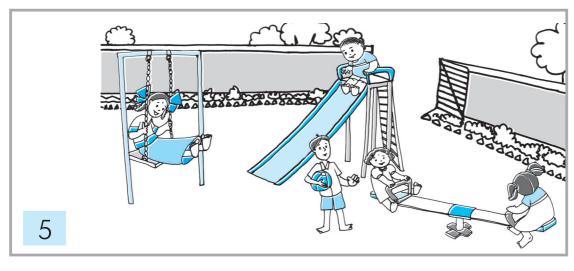


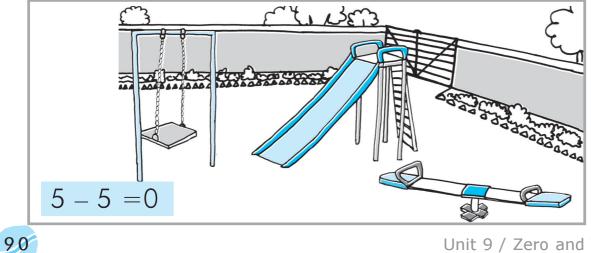
Unit 8 / Geometry

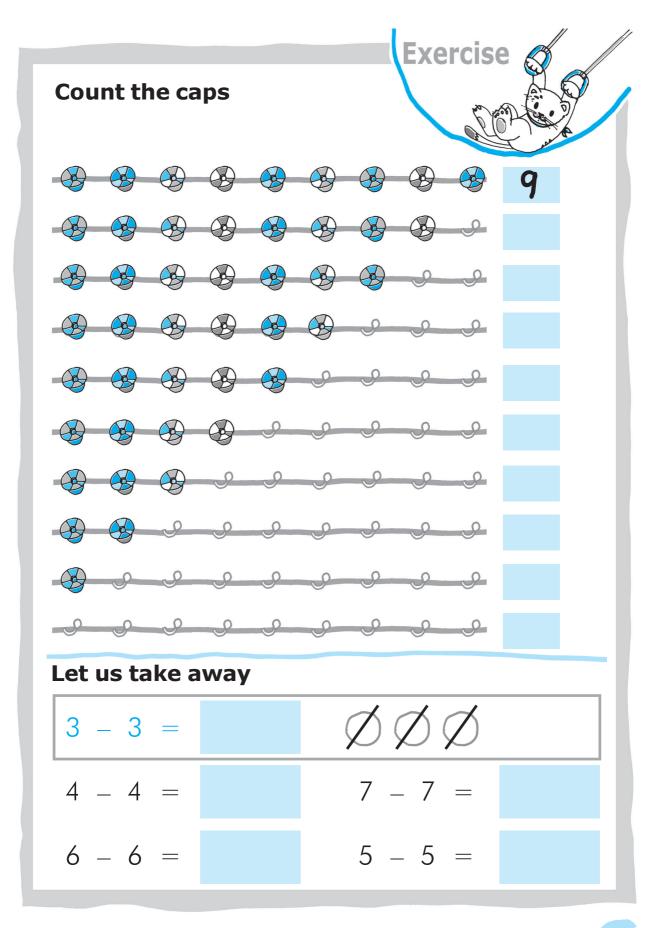




There were five children playing in the garden. All went home. How many are left?

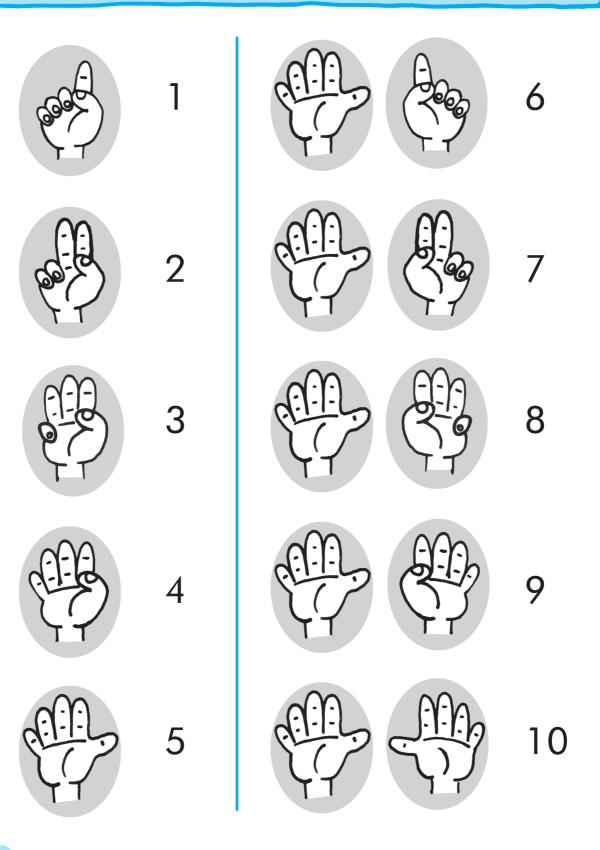




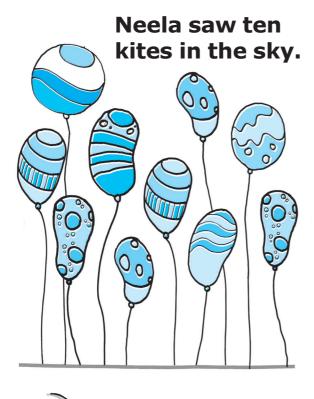


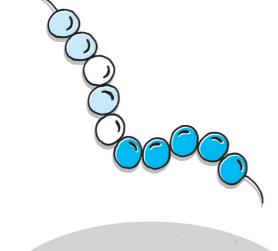
Introducing 10

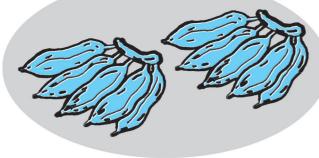
92



Ten









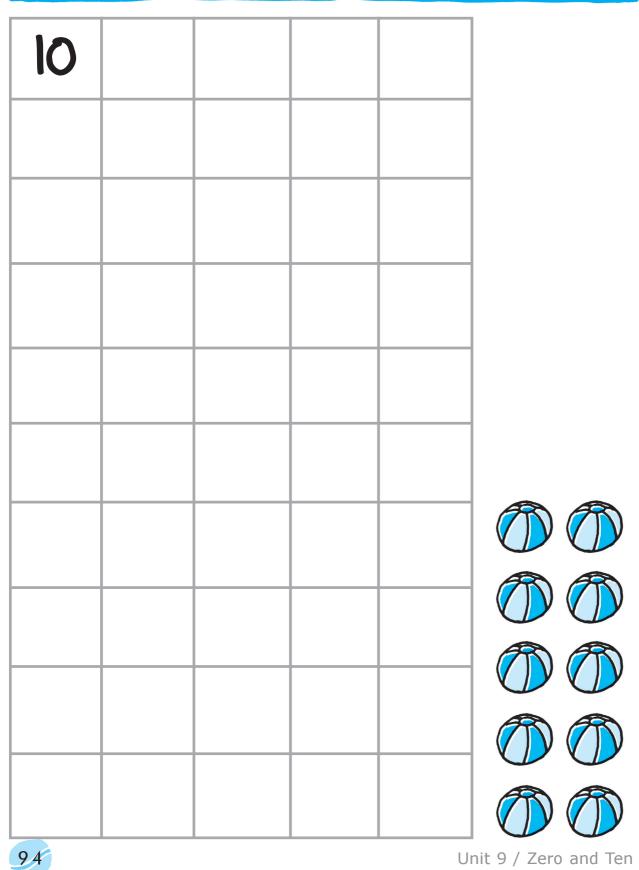


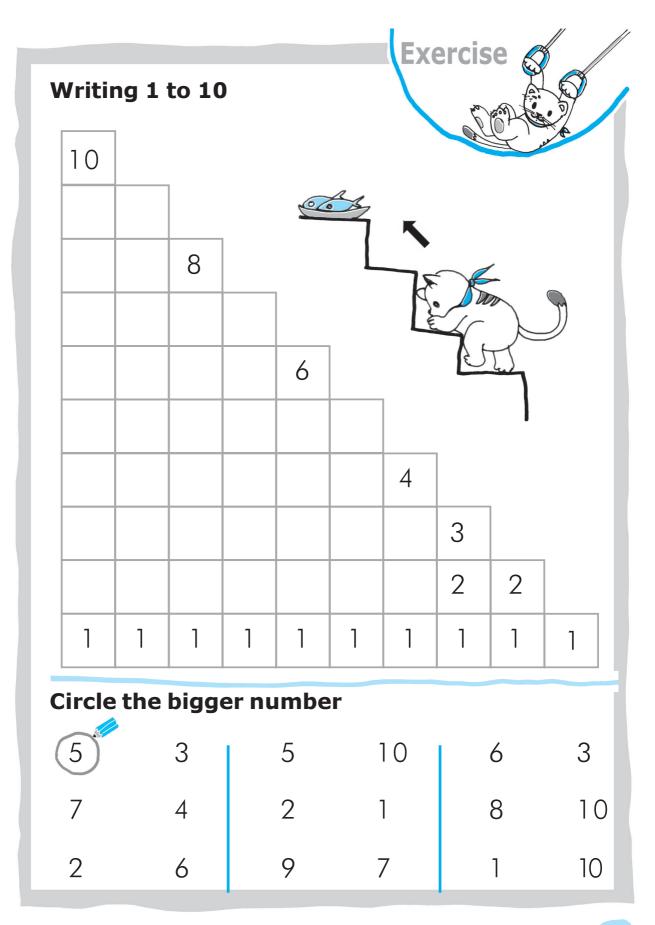


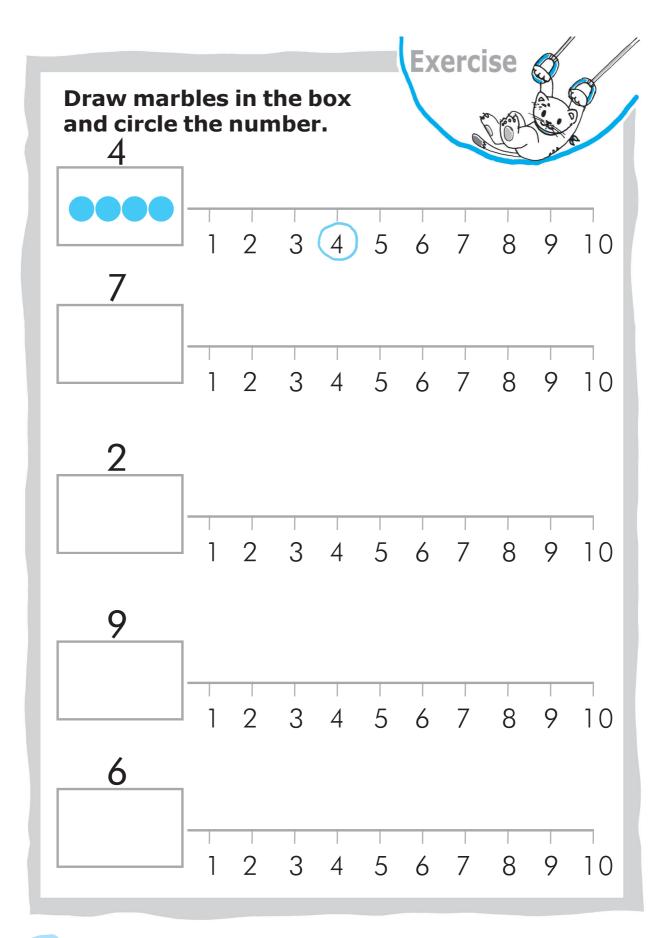


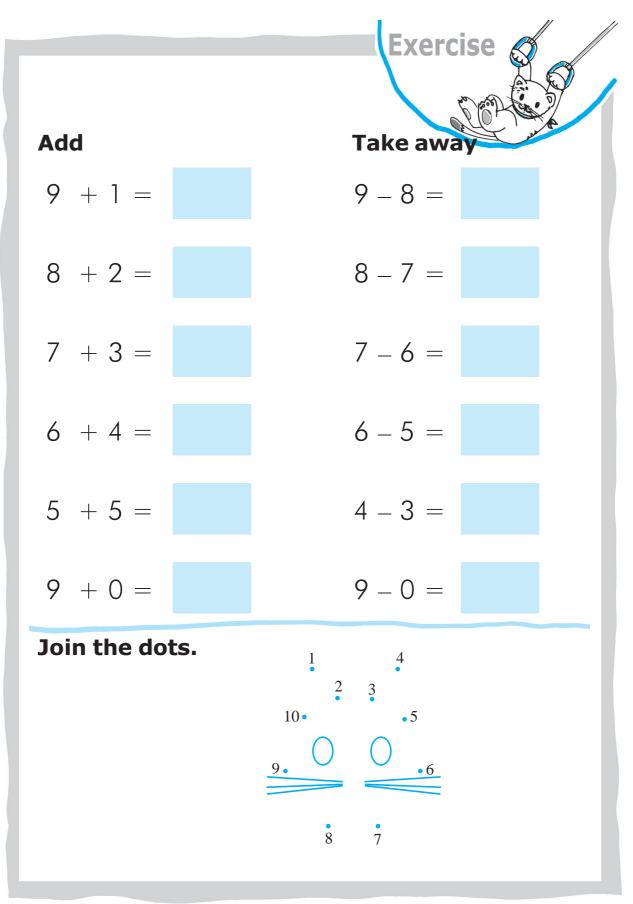


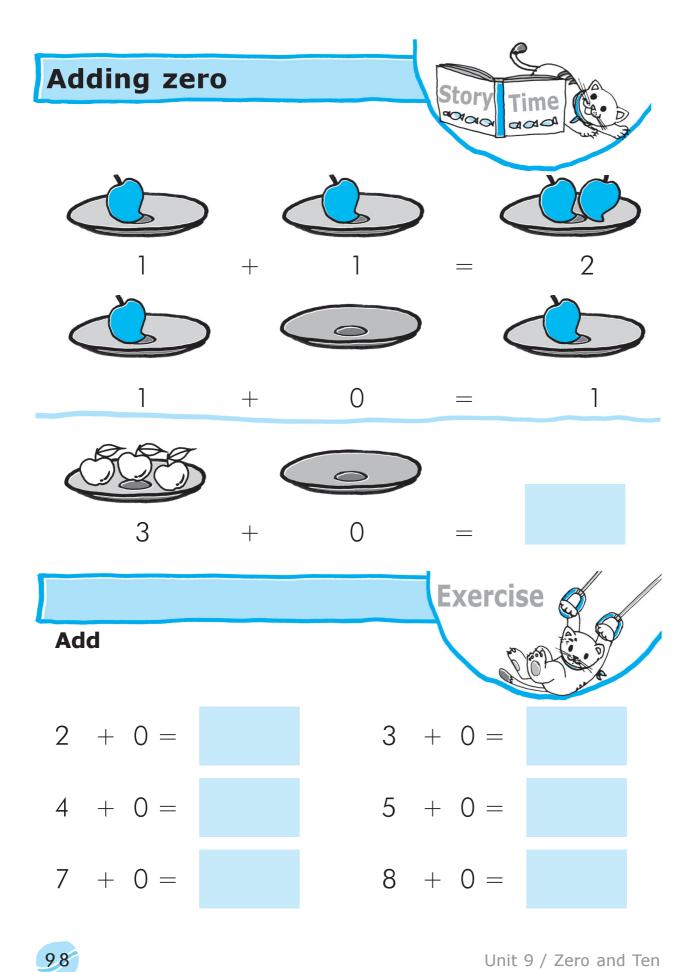
Writing 10

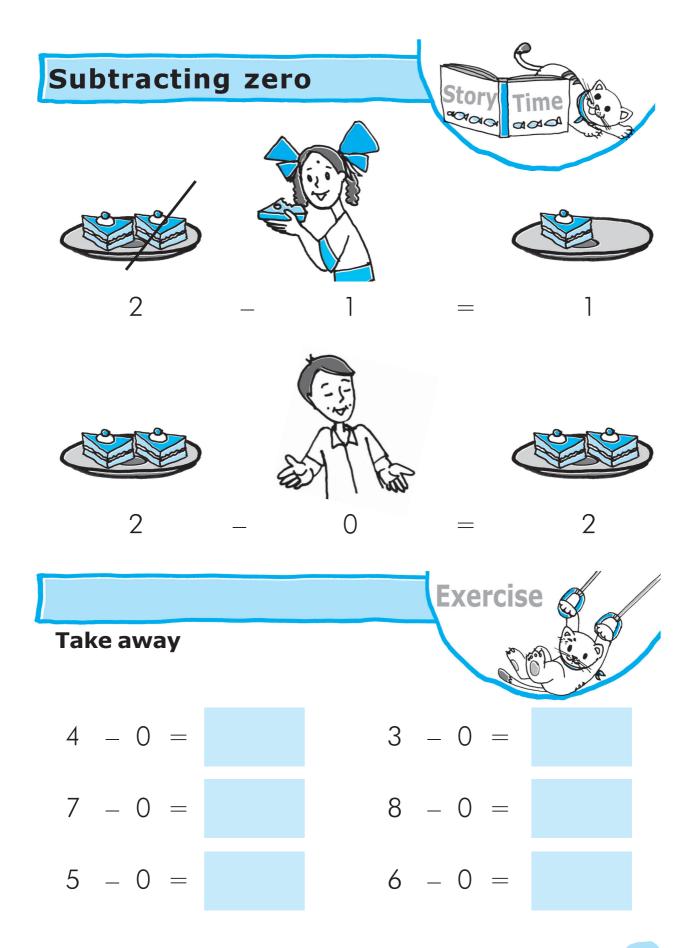


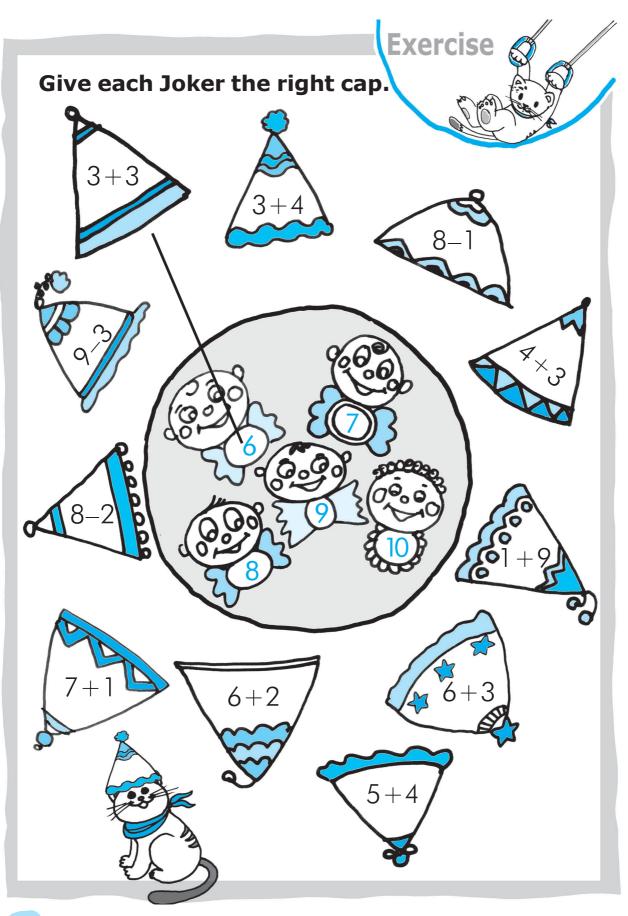




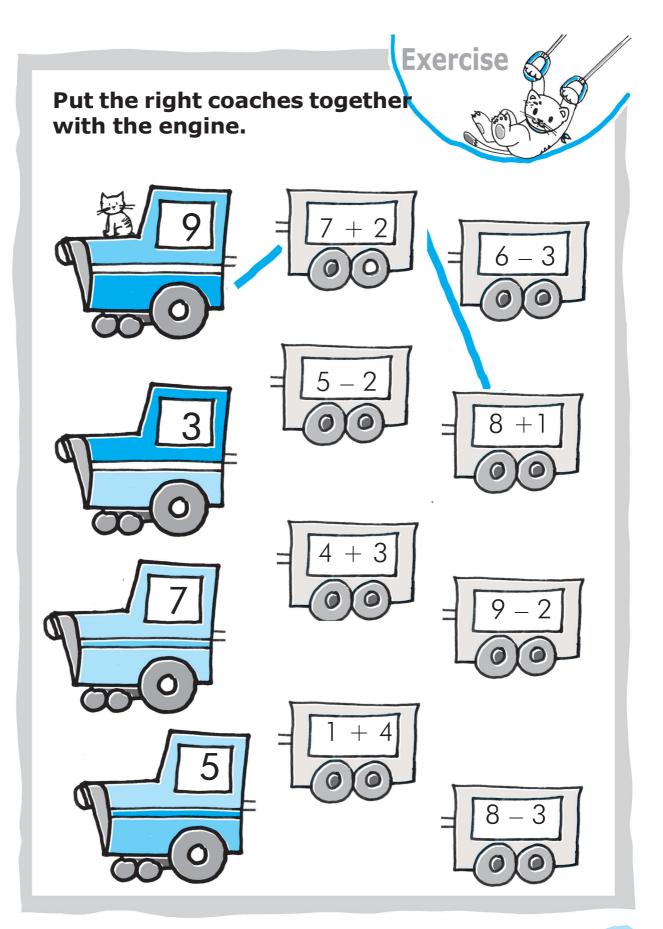












Patterns

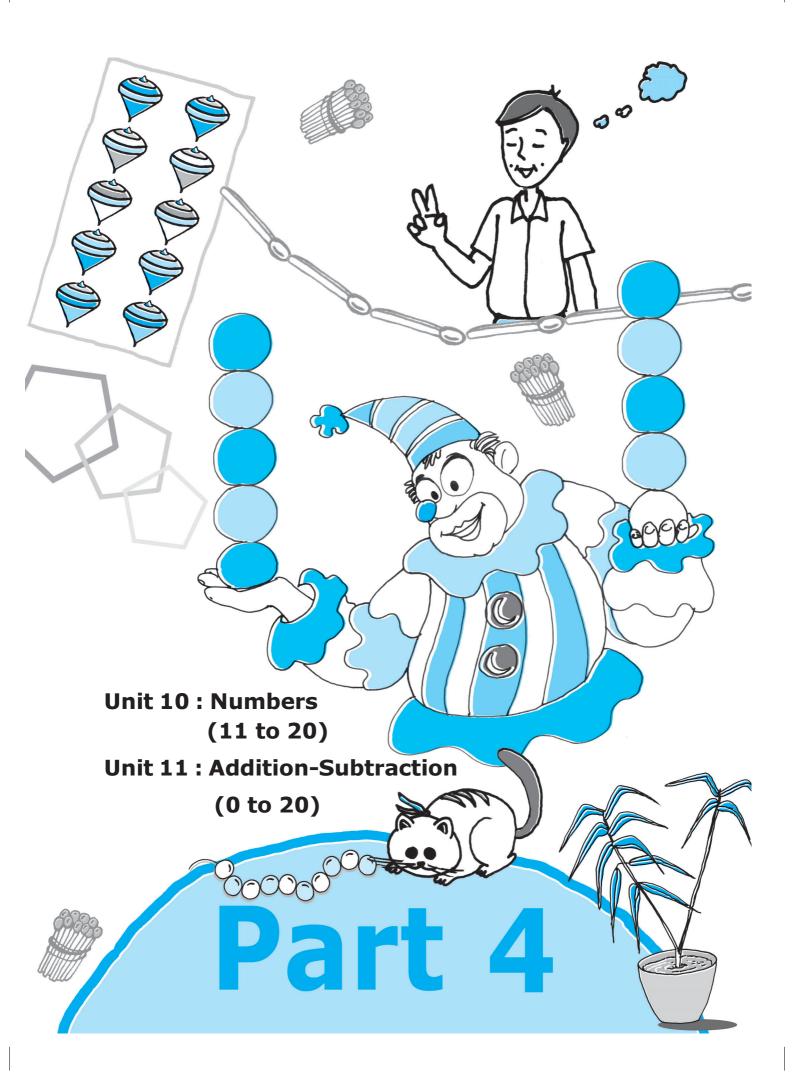
What is the pattern?

$$1 + 1 = 2$$
 $1 - 1 = 0$

- 2 + 1 = 3 2 1 = 1
- 3 + 1 = 4 3 1 = 2
- 4 + 1 = 5 4 1 = 3
- 5 + 1 = 6 5 1 = 4
- 6 + 1 = 7 6 1 = 5
- 7 + 1 = 8 7 1 = 6
- 8 + 1 = 9 8 1 = 7

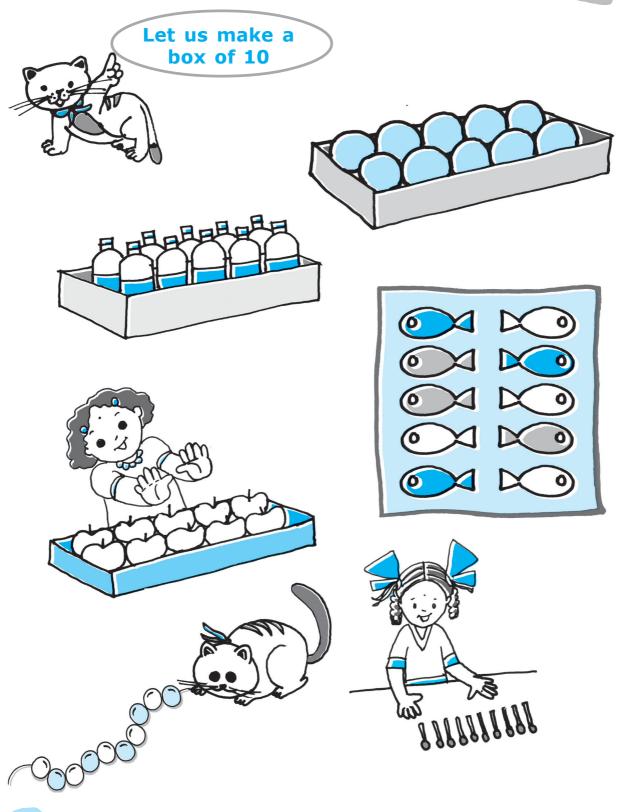
9 + 1 = 10 9 - 1 = 8



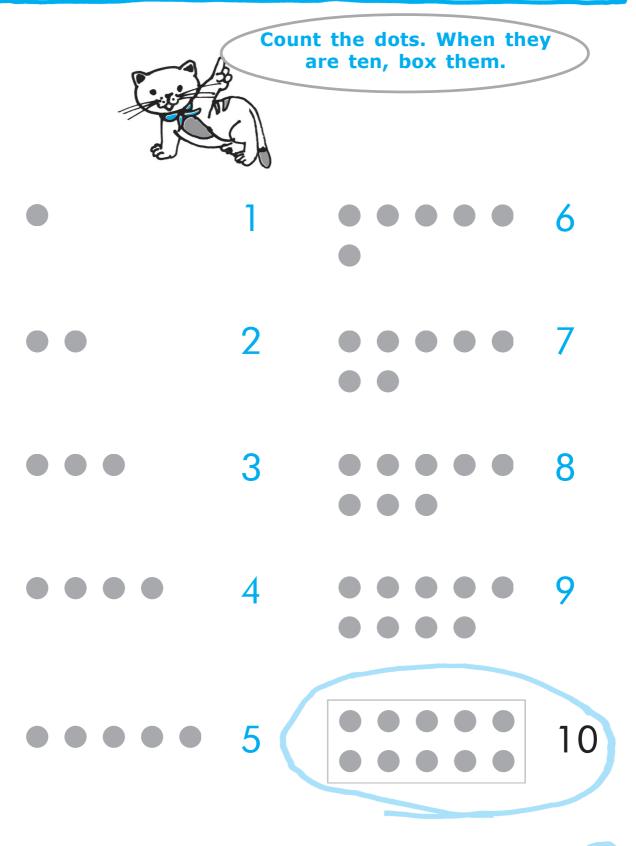


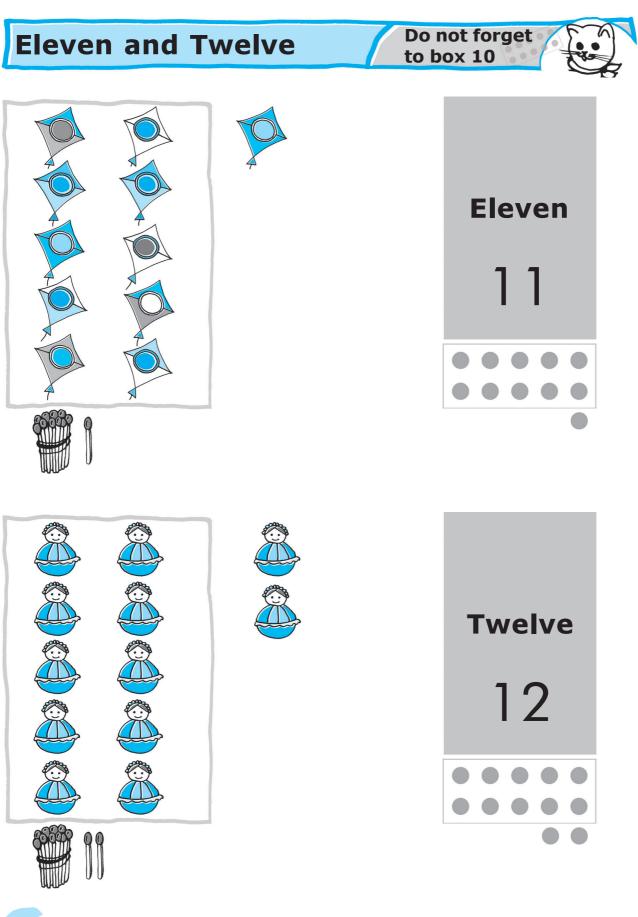
Unit 10

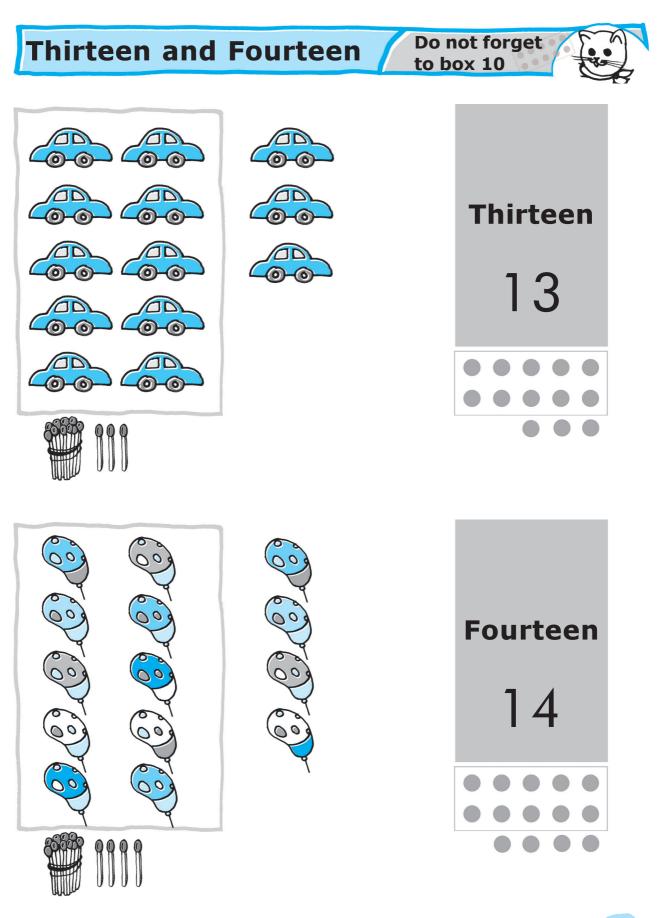
Box of 10



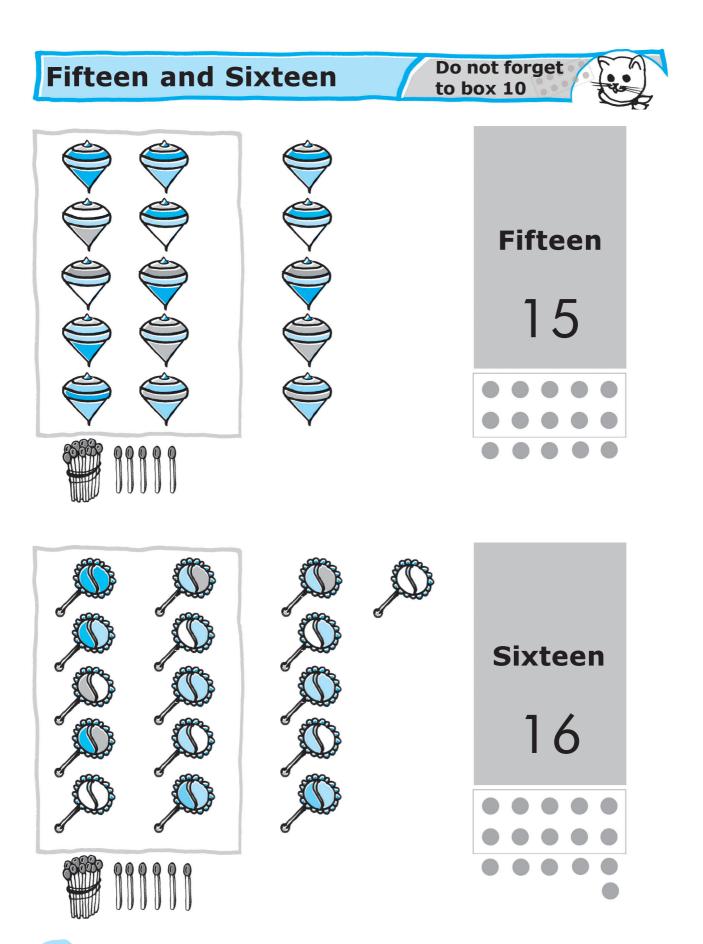
Box of ten

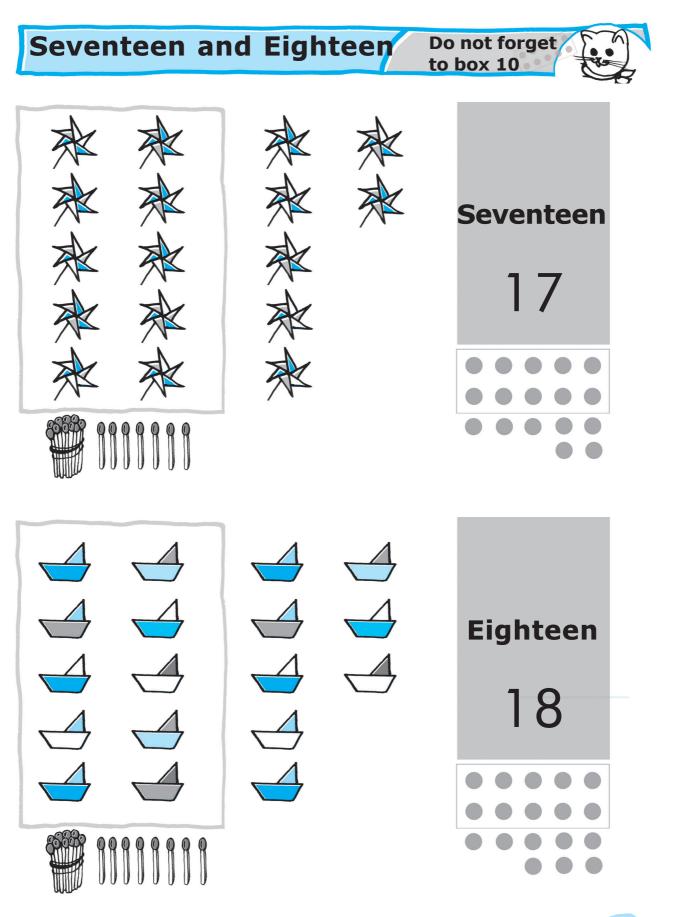


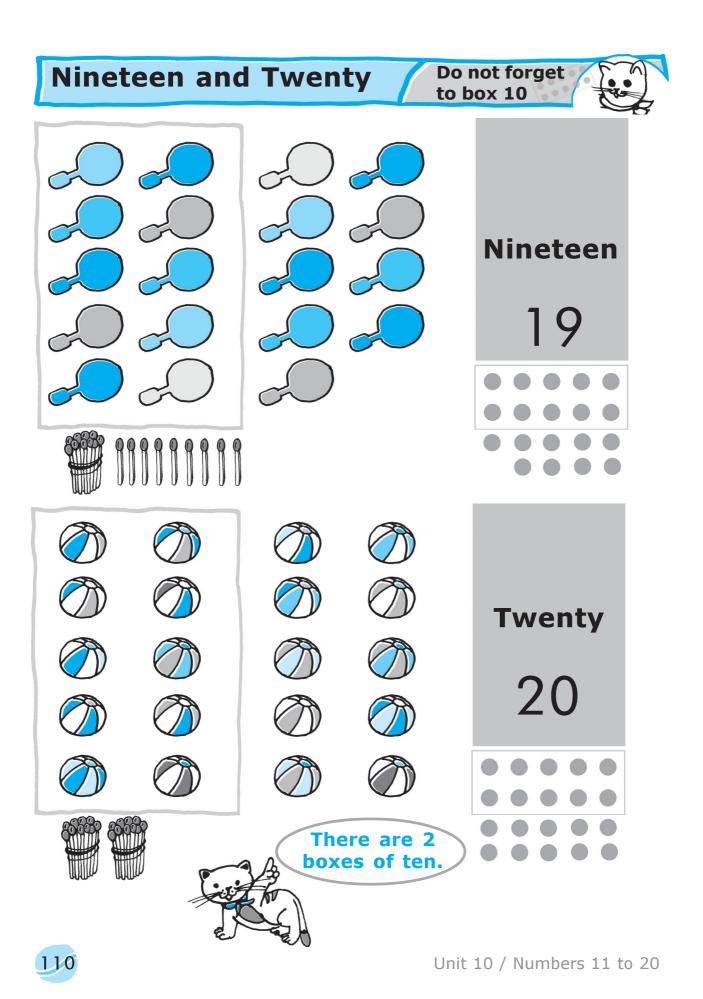




Unit 10/ Numbers 11 to 20





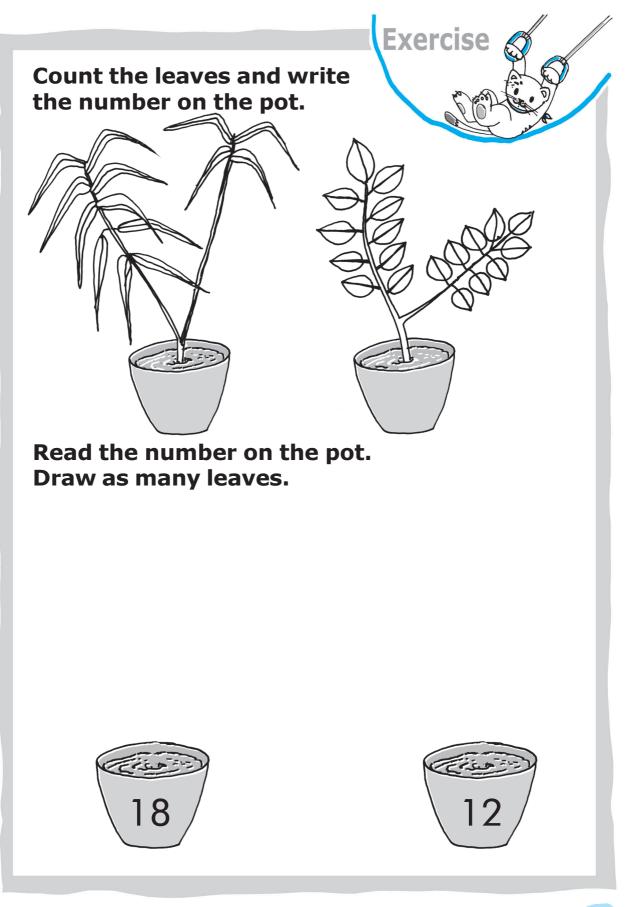


From 1 to 20		Do not forget to box 10	
٠	1		11
• •	2		12
• • •	3		13
• • • •	4		14
••••	5		15
• • • • •	6		16
	7		17
	8		18
	9		19
	10		20
Unit 10/ Numbers 11 to 2	20		LVI

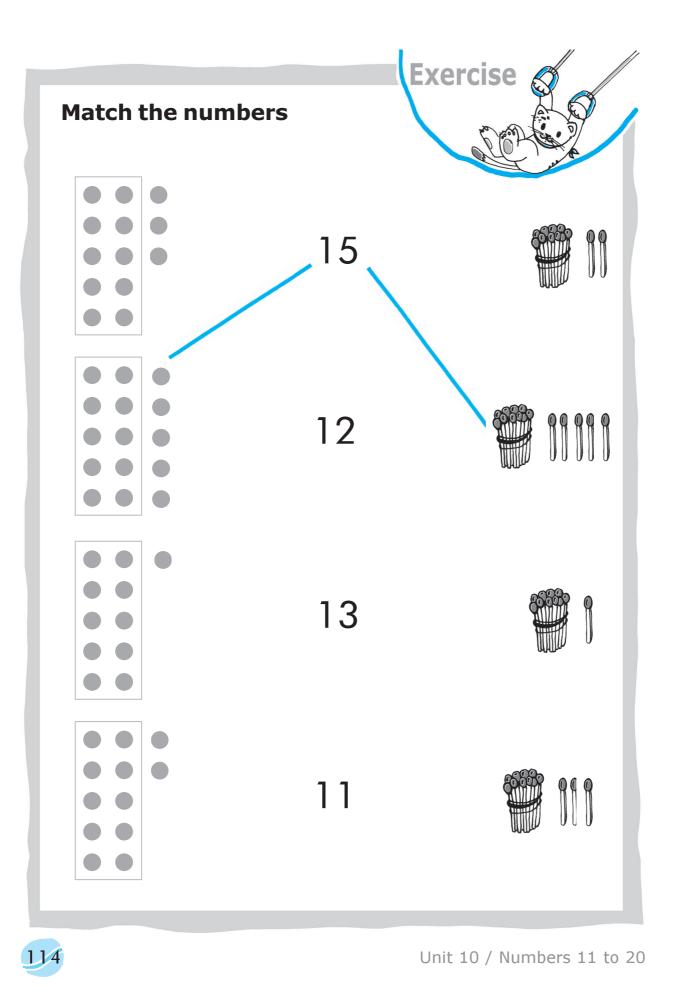


Unit 10 / Numbers 11 to 20



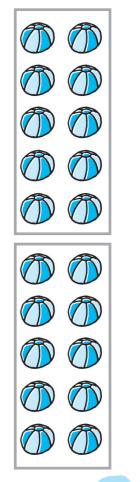


Unit 10/ Numbers 11 to 20



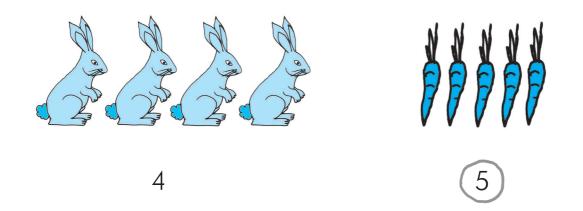
Writing numbers

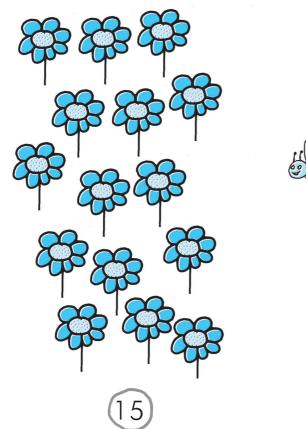
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

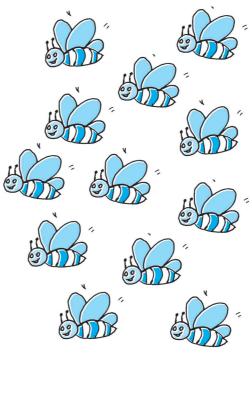


Unit 10/ Numbers 11 to 20

Which is more?

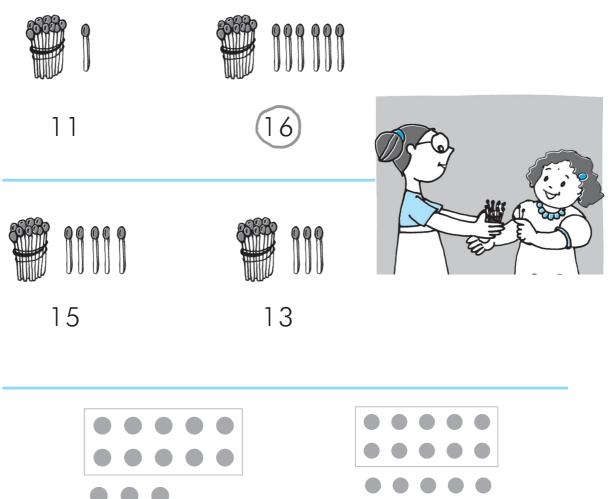


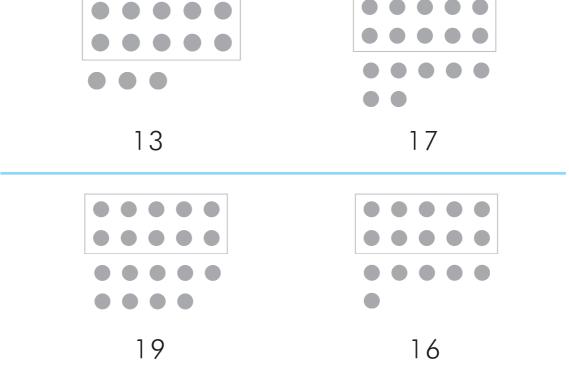




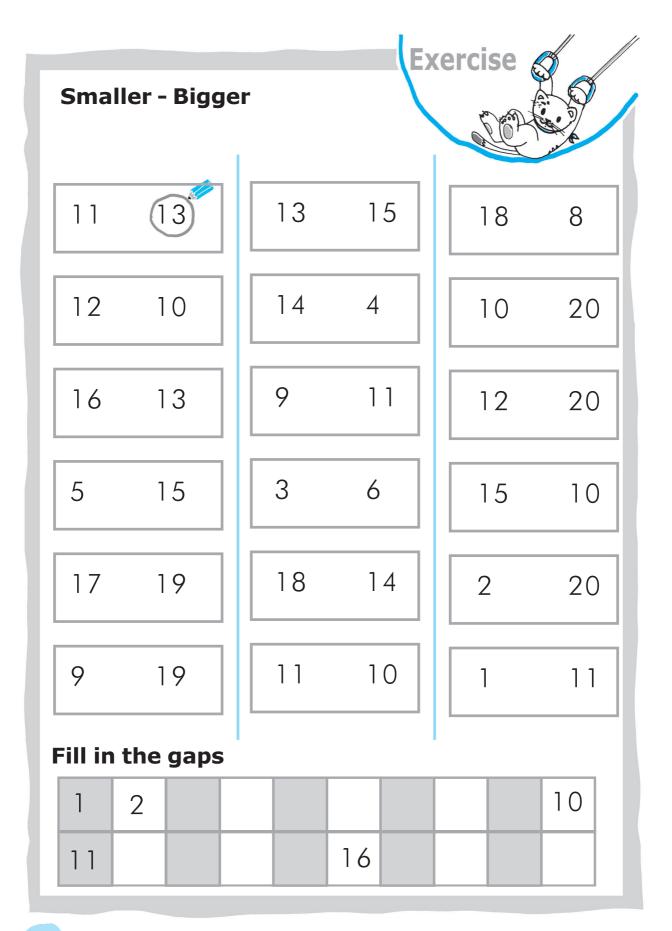


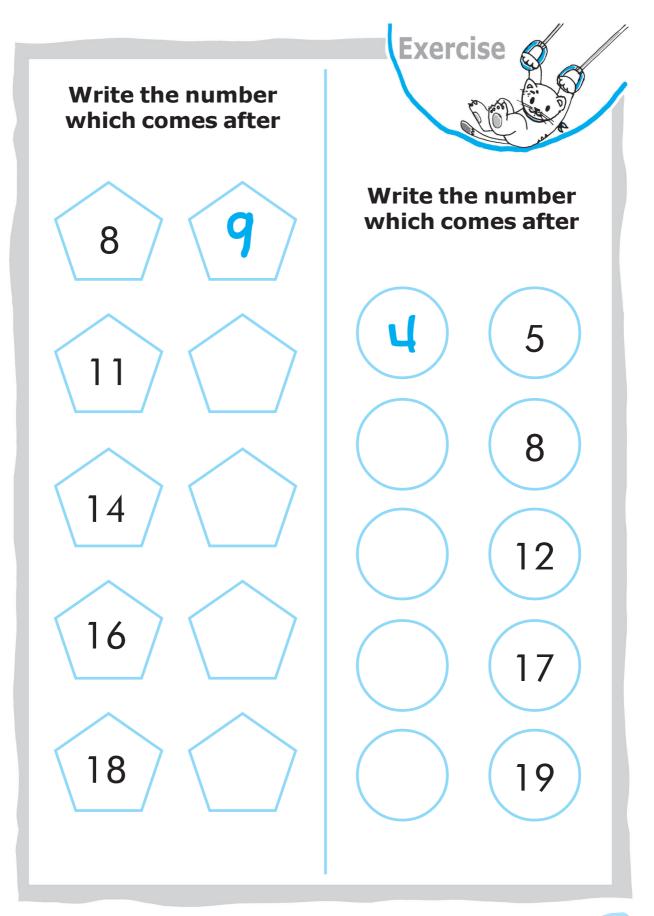
Smaller - Bigger











Patterns

What is the pattern?

$$9 + 1 = 10$$

$$2 - 2 = 0$$

$$8 + 2 = 10$$

$$3 - 2 = 1$$

$$7 + 3 = 10$$

$$4 - 2 = 2$$

$$6 + 4 = 10$$

$$5 - 2 = 3$$

$$5 + 5 = 10$$

$$6 - 2 = 4$$

$$6 + 4 = 10$$

$$7 - 2 = 5$$

$$7 + 3 = 10$$

$$8 - 2 = 6$$

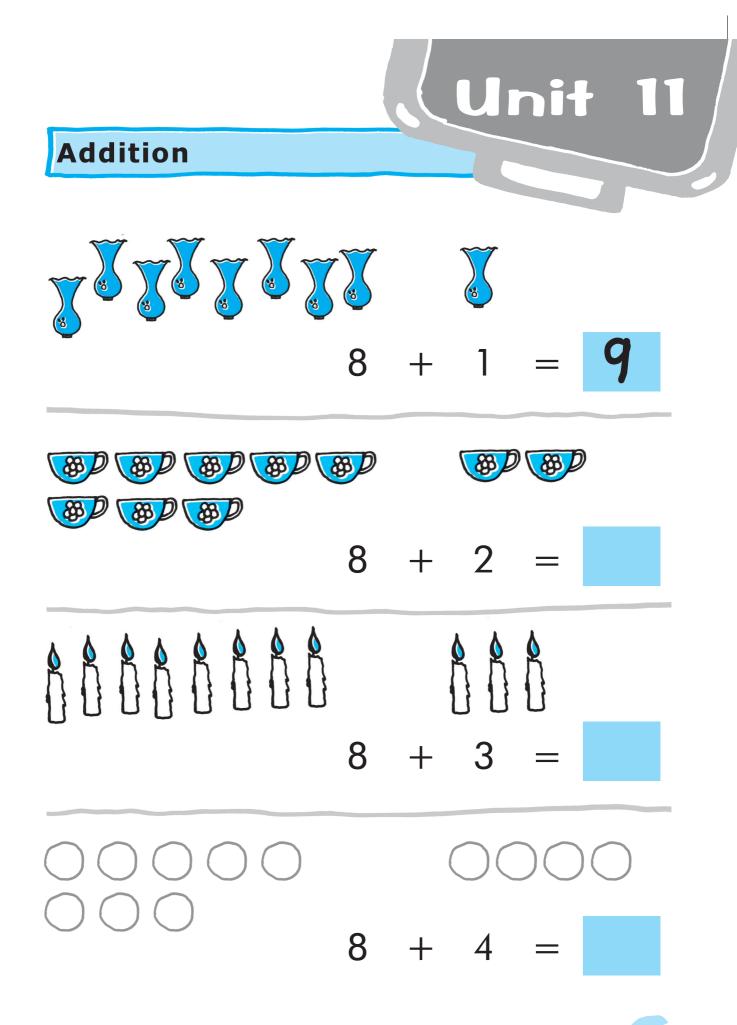
$$8 + 2 = 10$$

$$9 - 2 = 7$$

$$9 + 1 = 10$$

Unit 10 / Numbers 11 to 20

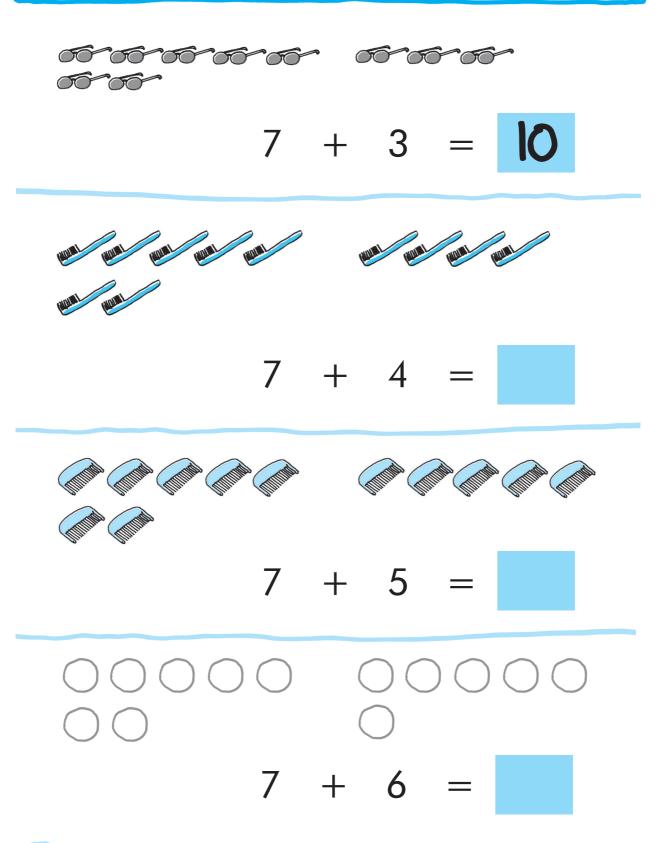




121

Unit 11 / Add, subtract (0 to 20)

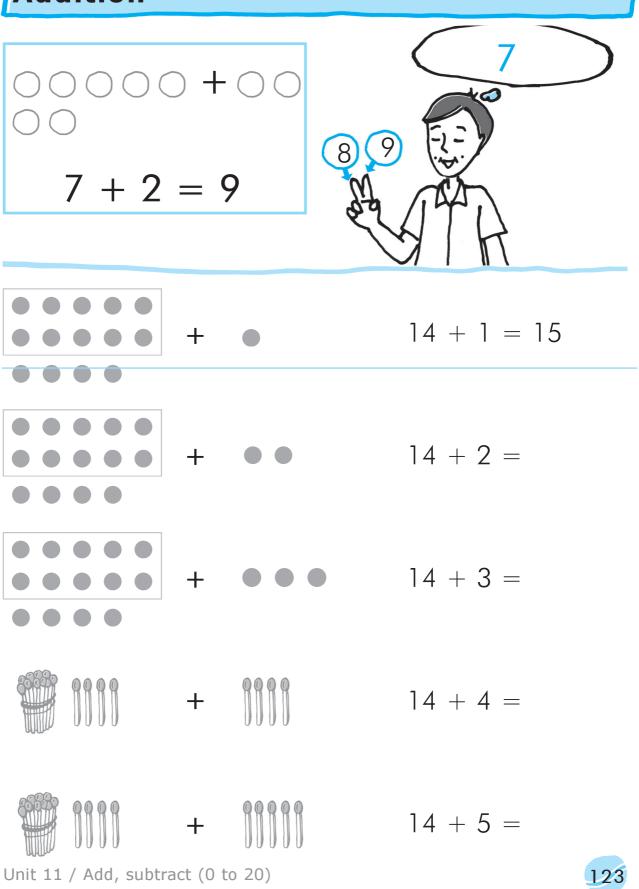
Addition

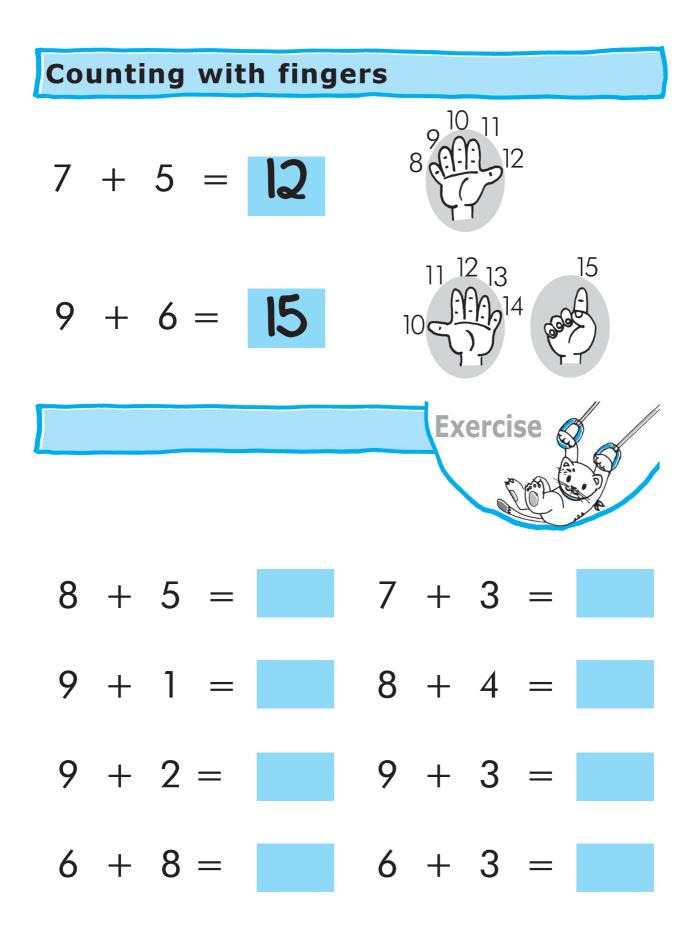


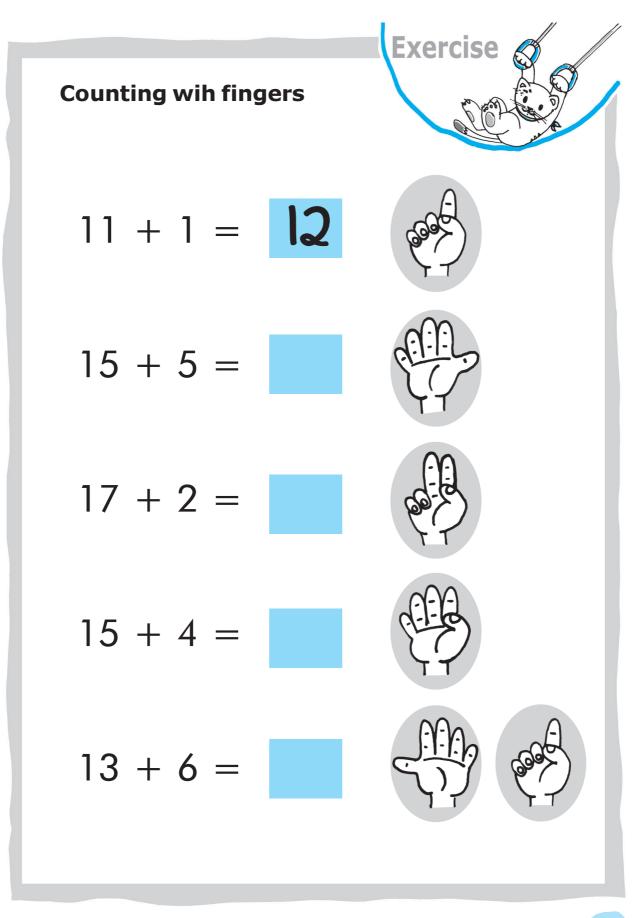
122

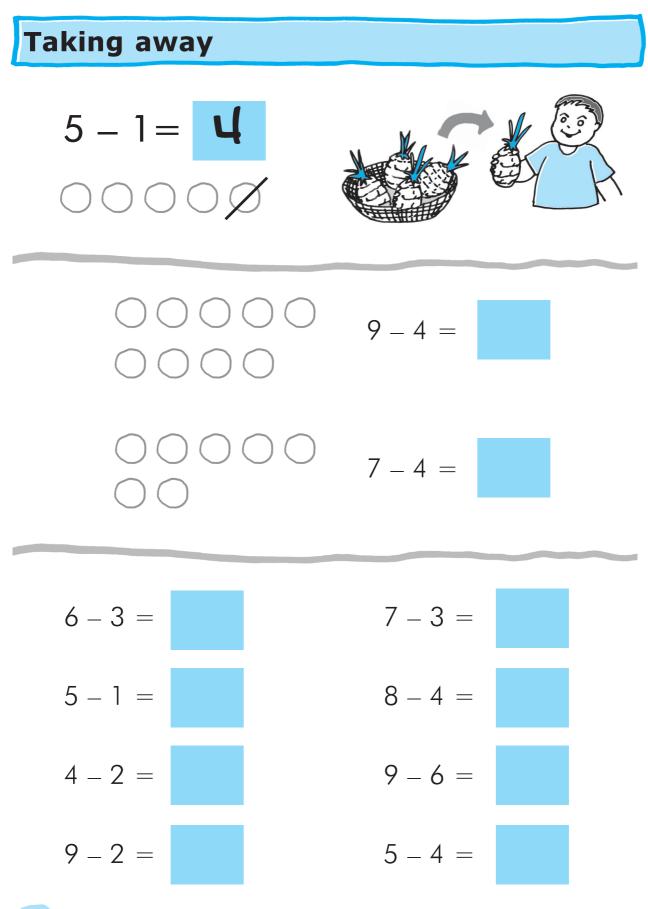
Unit 11 / Add, subtract (0 to 20)

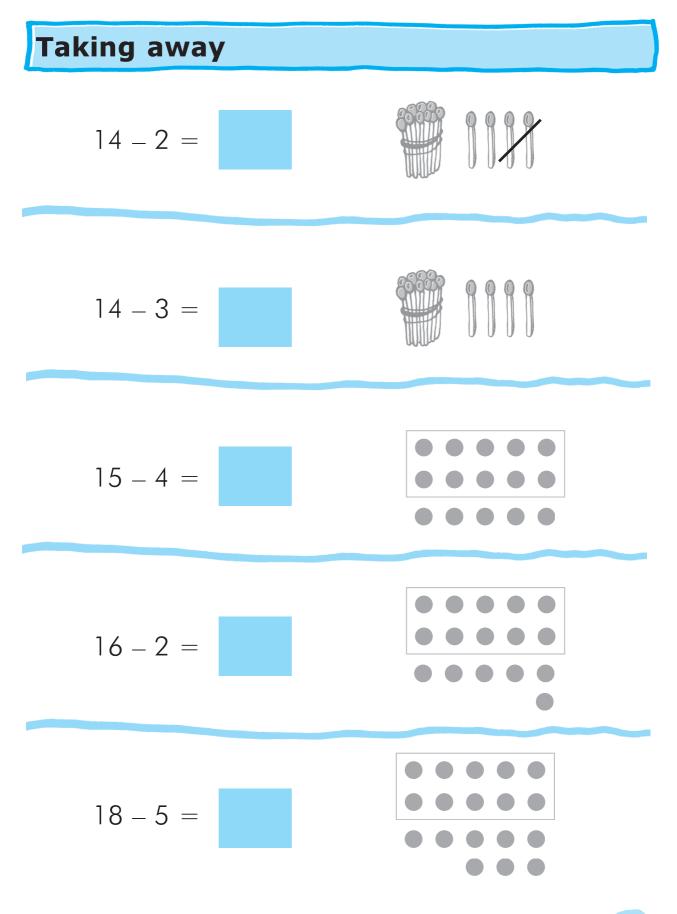
Addition

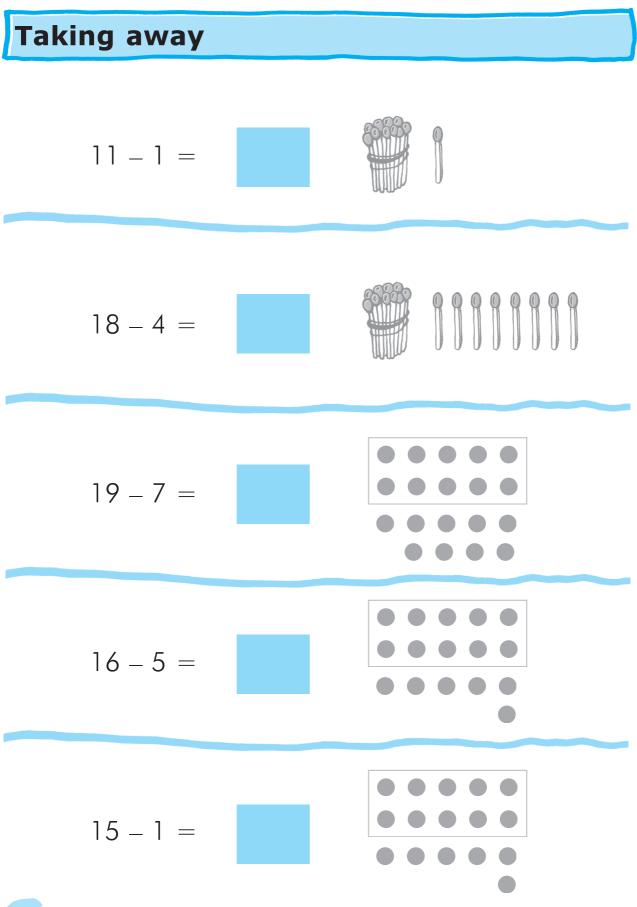


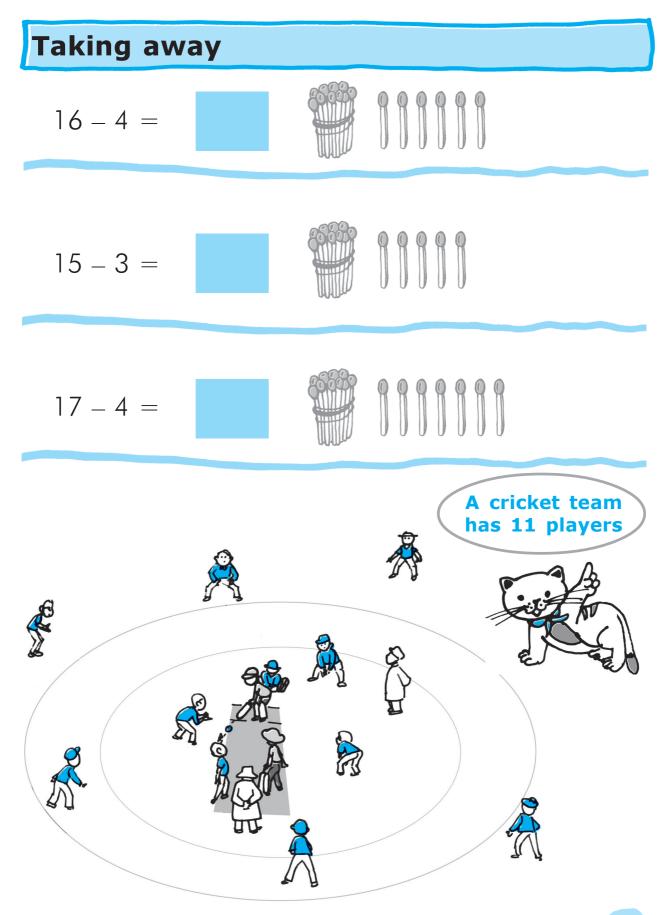




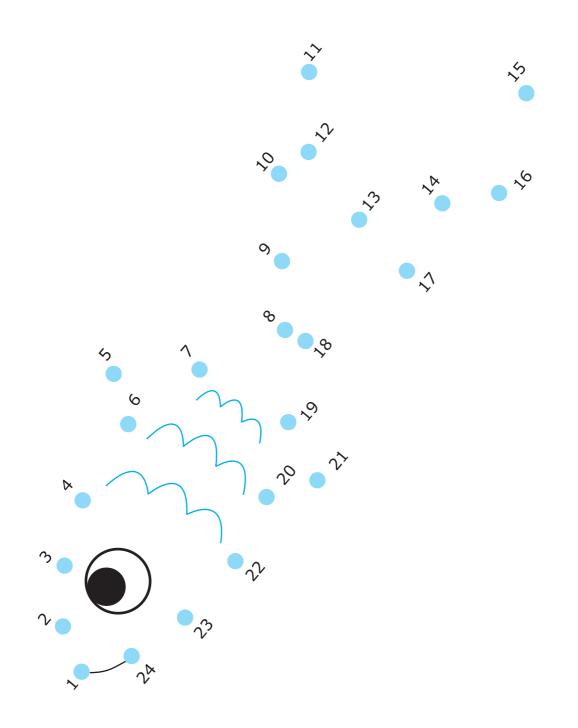




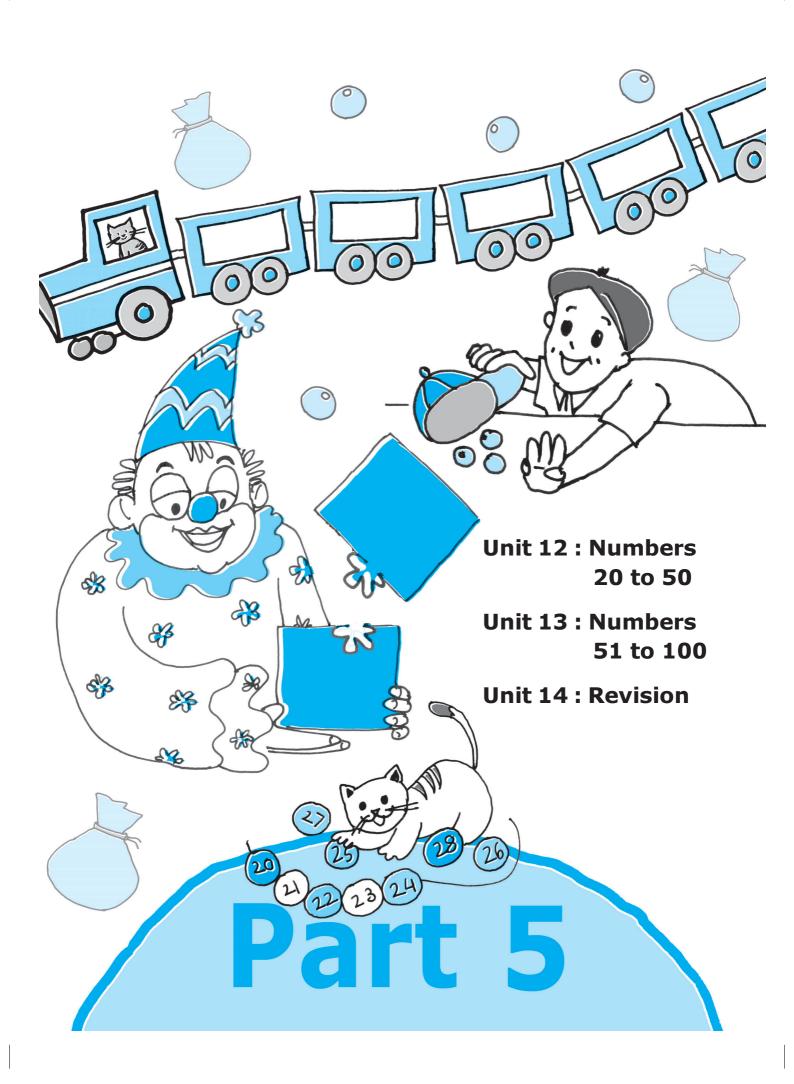


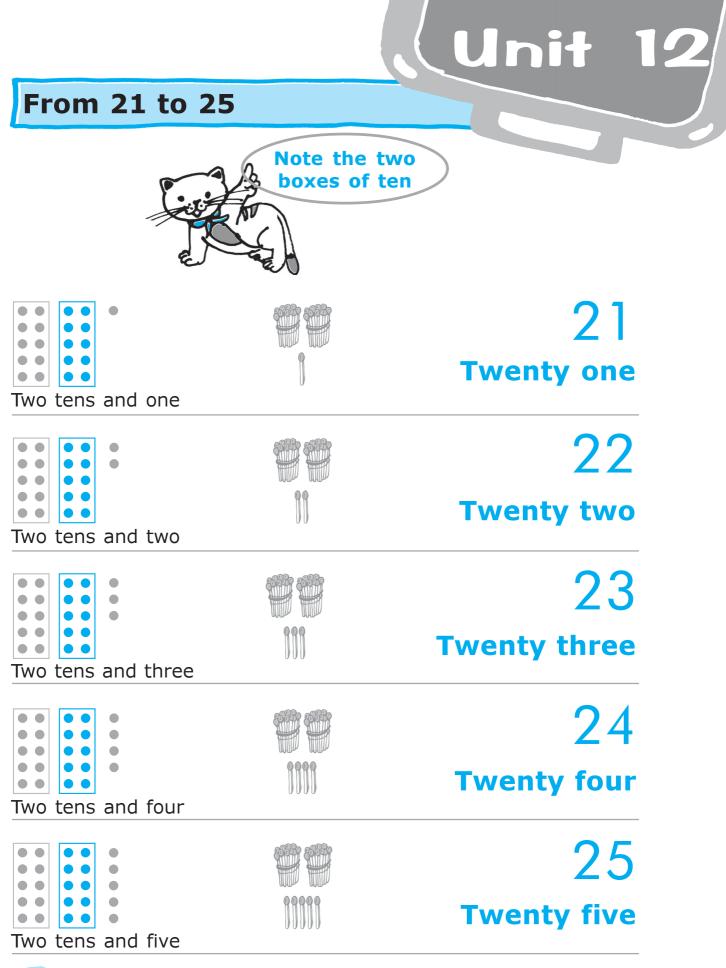


Join the dots



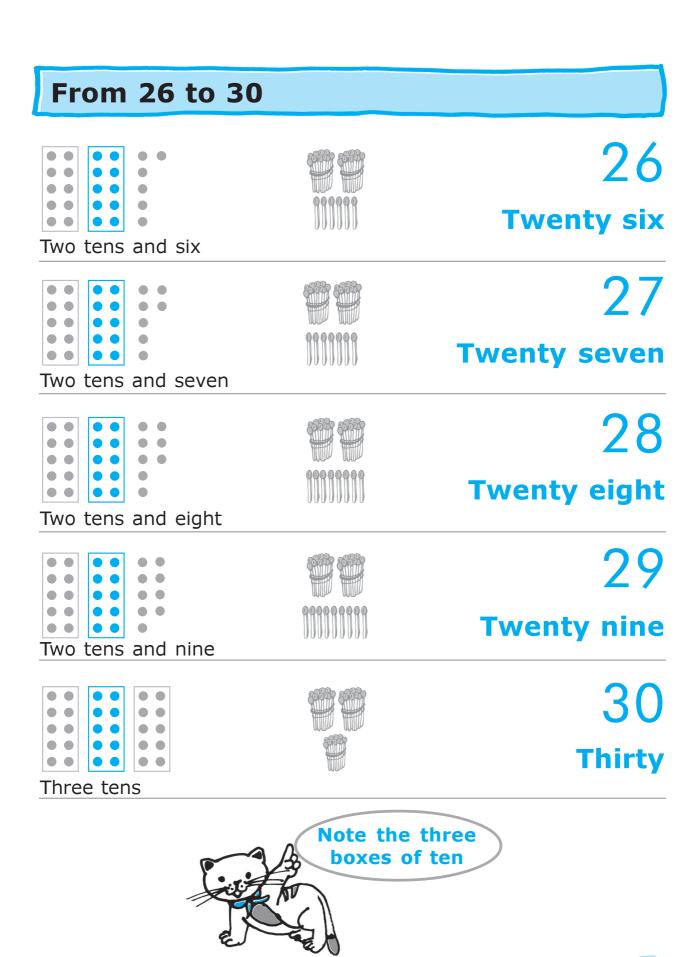




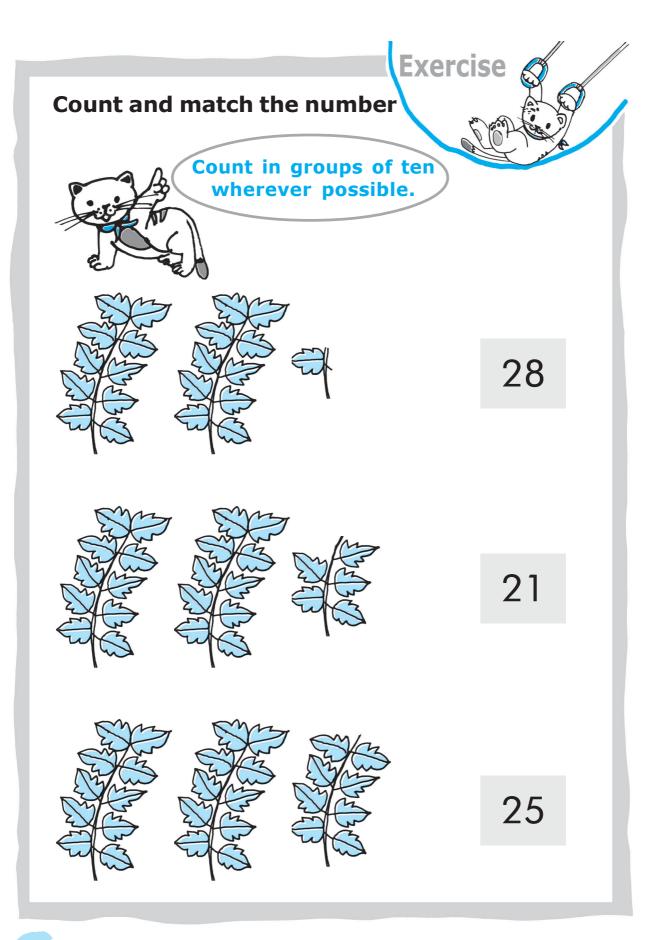


132

Unit 12 / Numbers 20 to 50



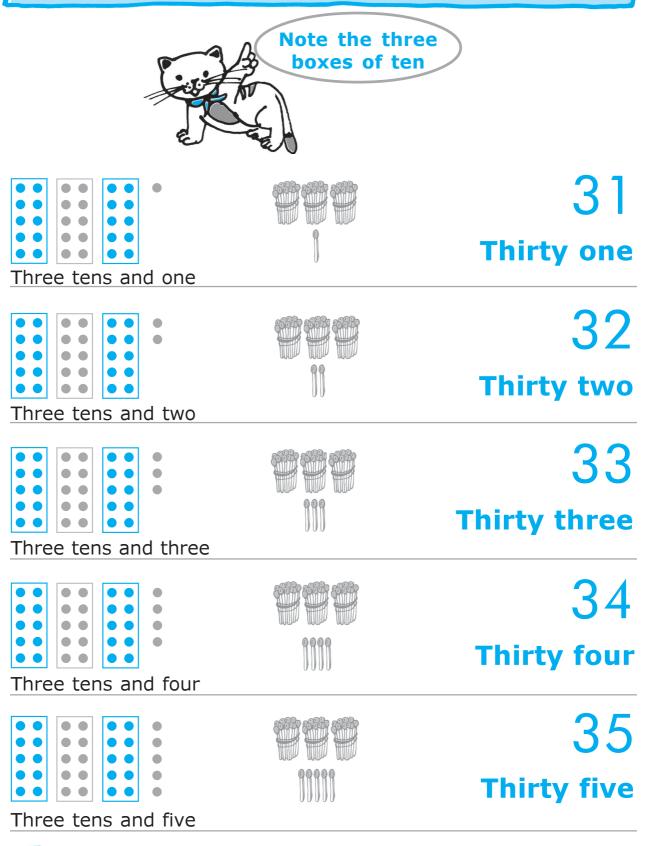
Unit 12 / Numbers 21 to 50



Writing 21 to 30									
21	22	23	24	25	26	27	28	29	30
21							28		
21			24						30
21						27			
21		23							
21								29	
Fill in the boxes.									
21		23	2	4			6		
	9	10	1 [1	8				26

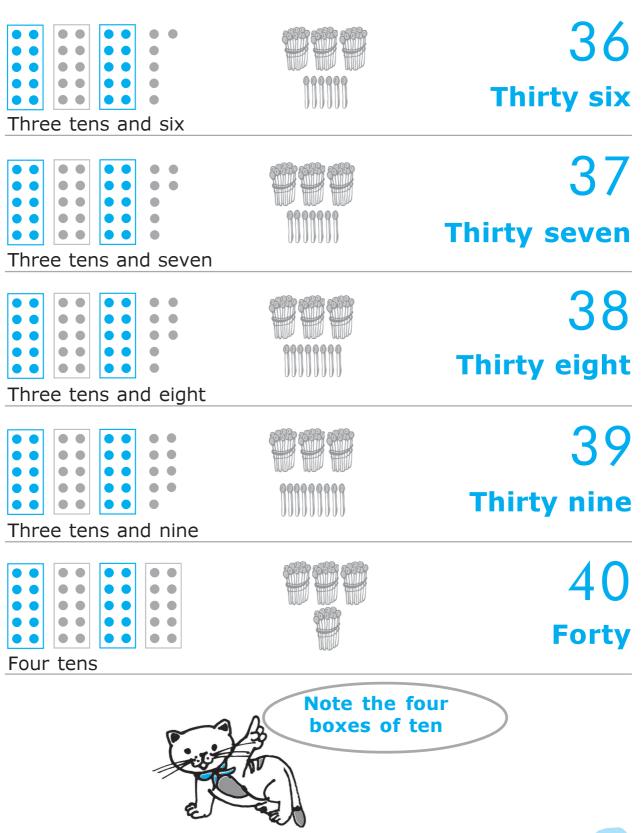
Unit 12 / Numbers 21 to 50

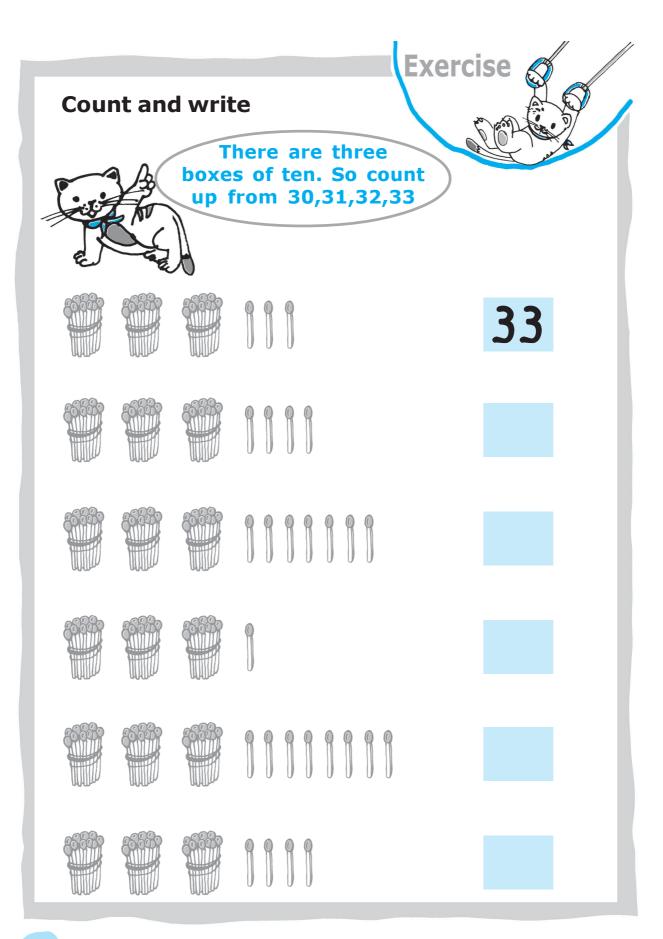
From 31 to 35



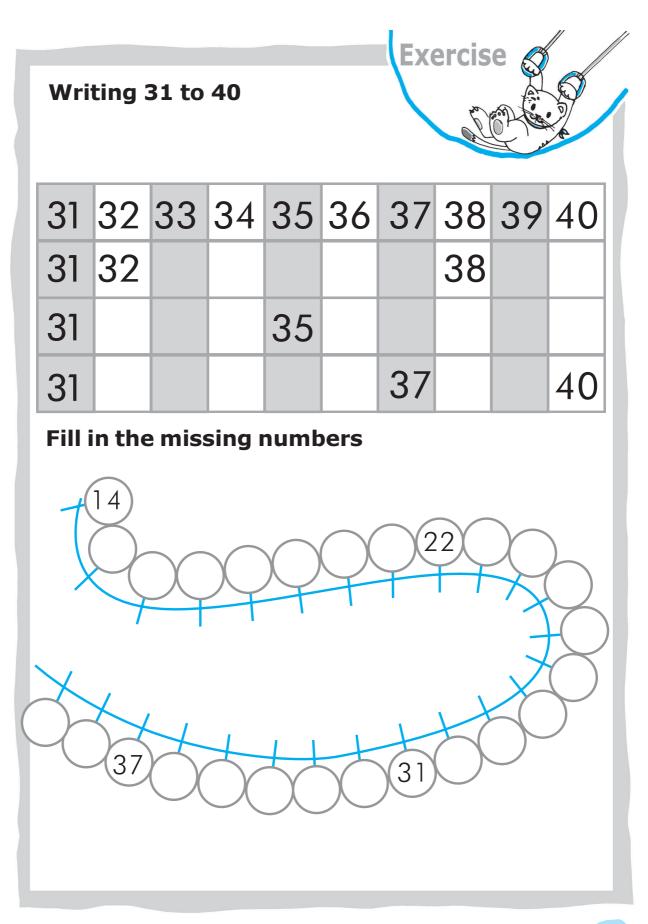


From 36 to 40



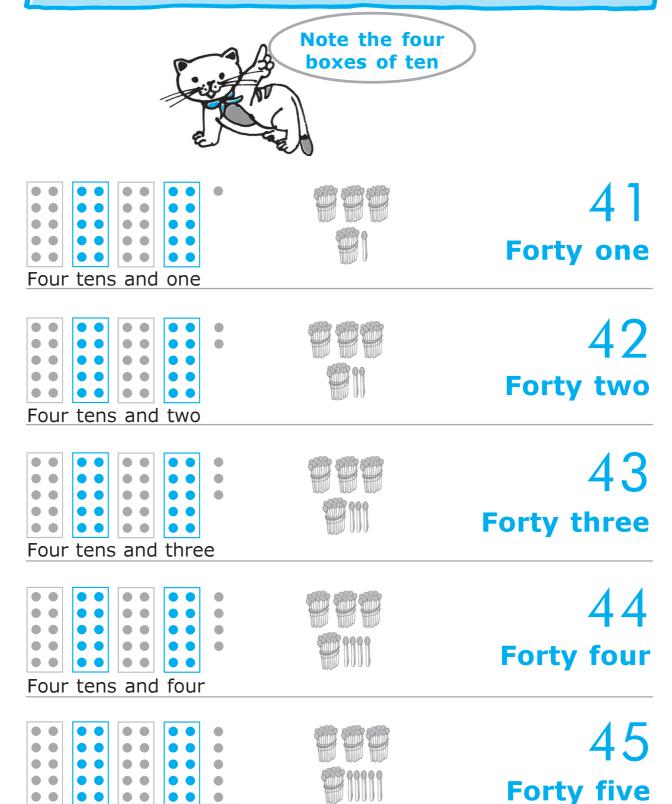


Unit 12 / Numbers 20 to 50



Unit 12 / Numbers 21 to 50

From 41 to 45

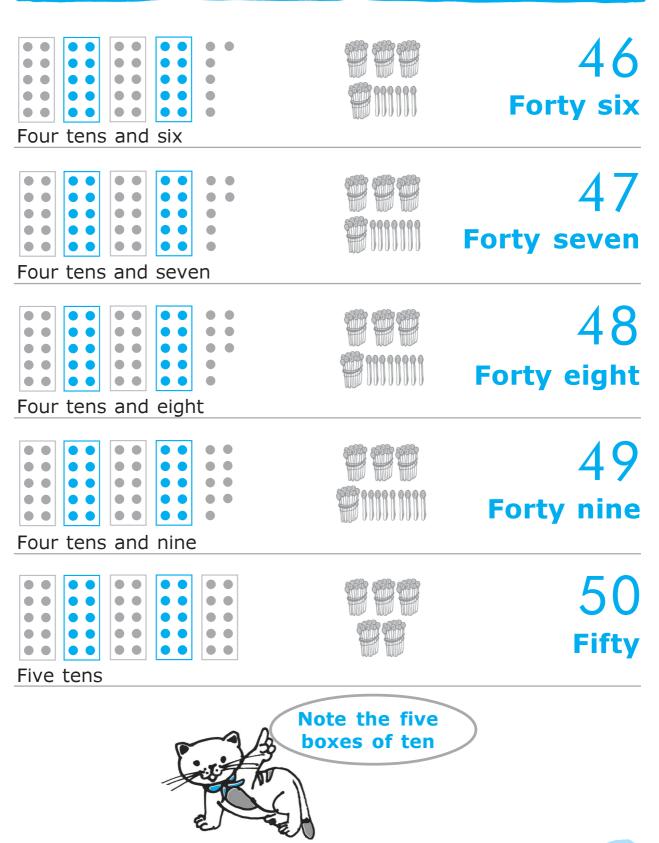


Unit 12 / Numbers 20 to 50

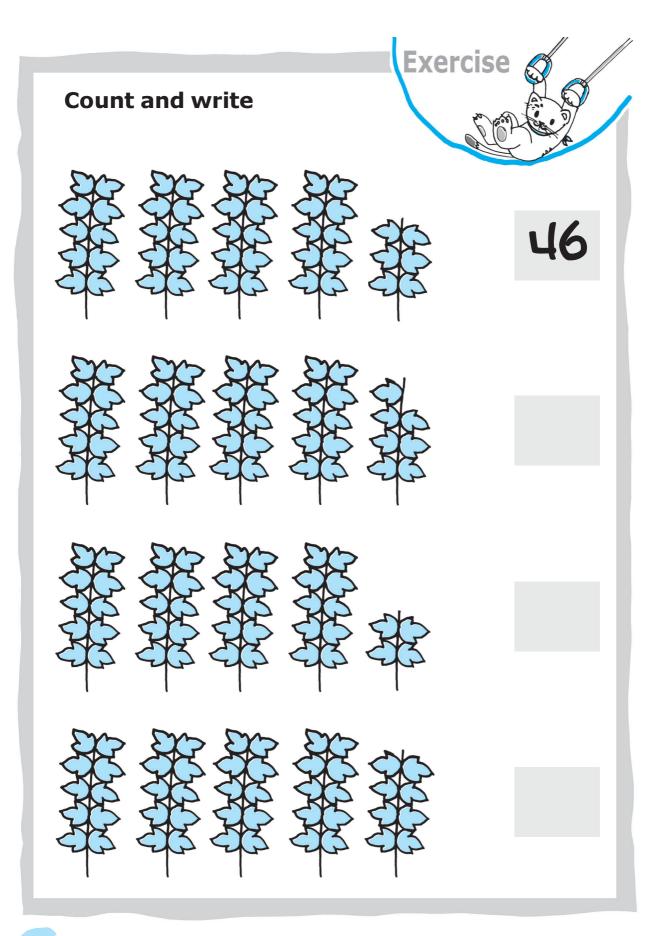


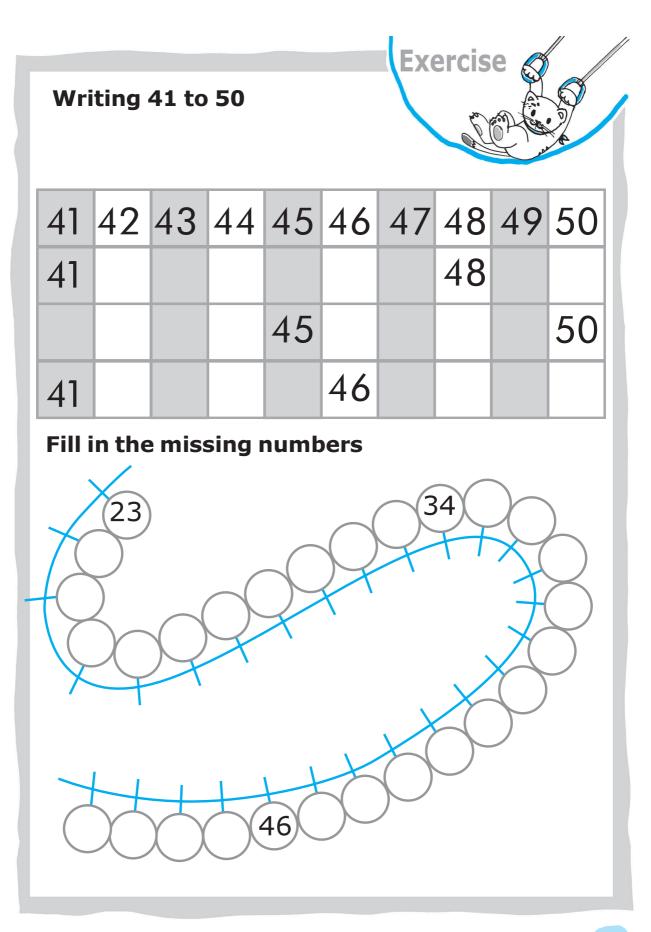
Four tens and five

From 46 to 50

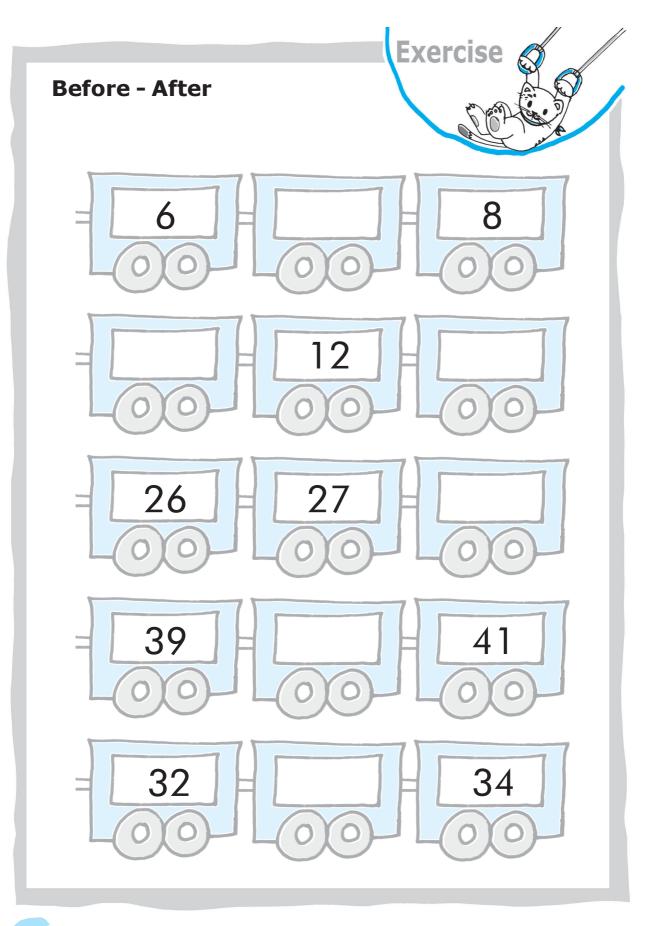


Unit 12 / Numbers 21 to 50

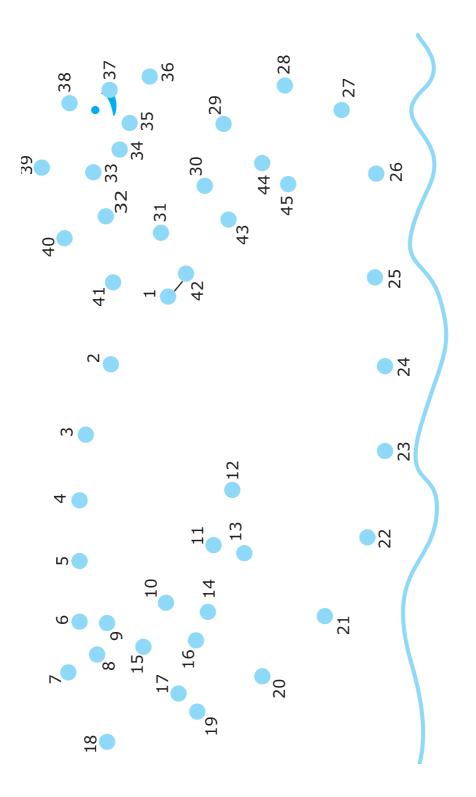


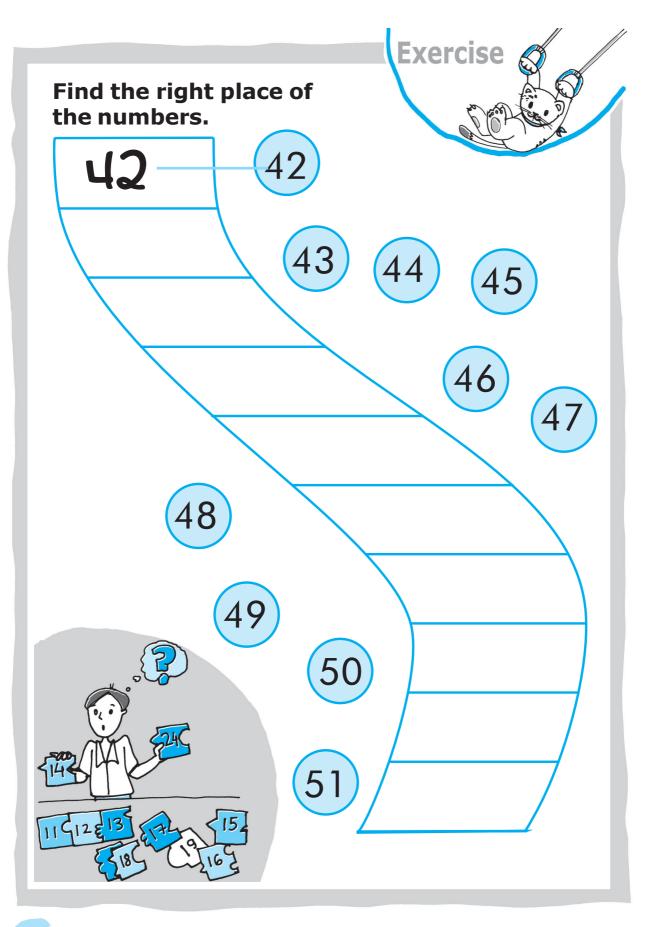


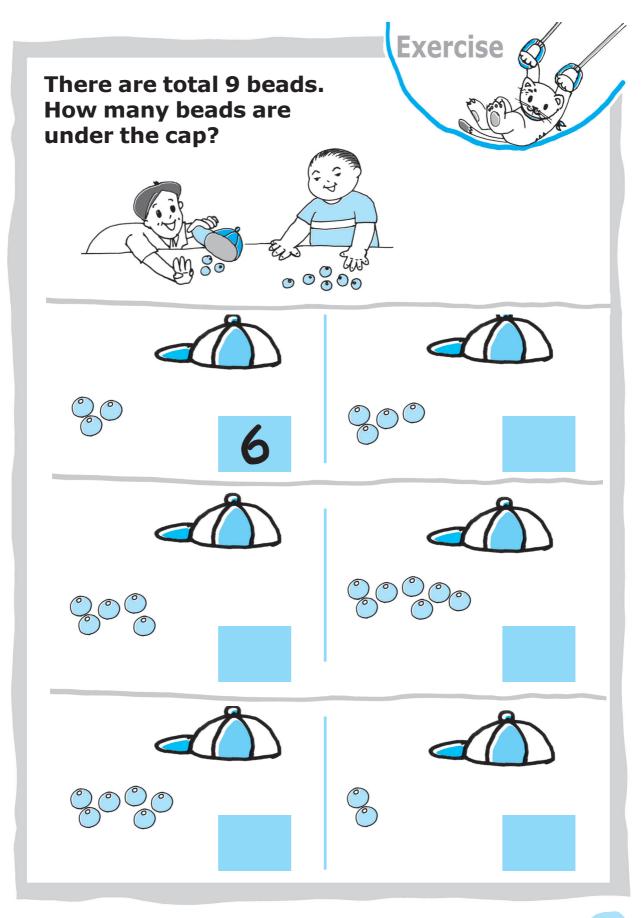
Unit 12 / Numbers 21 to 50



Join the dots

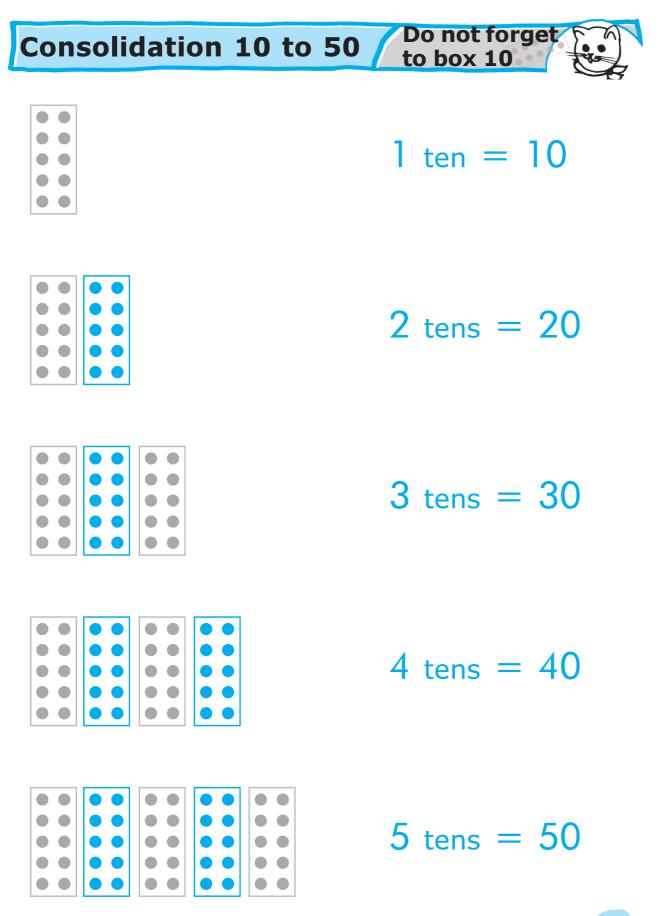




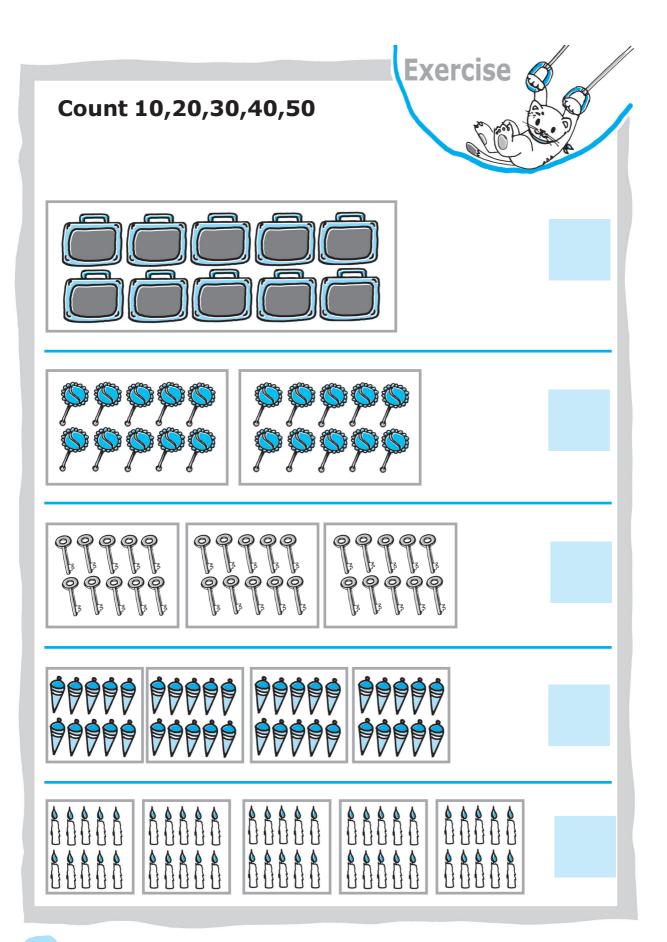


Unit 12 / Numbers 21 to 50

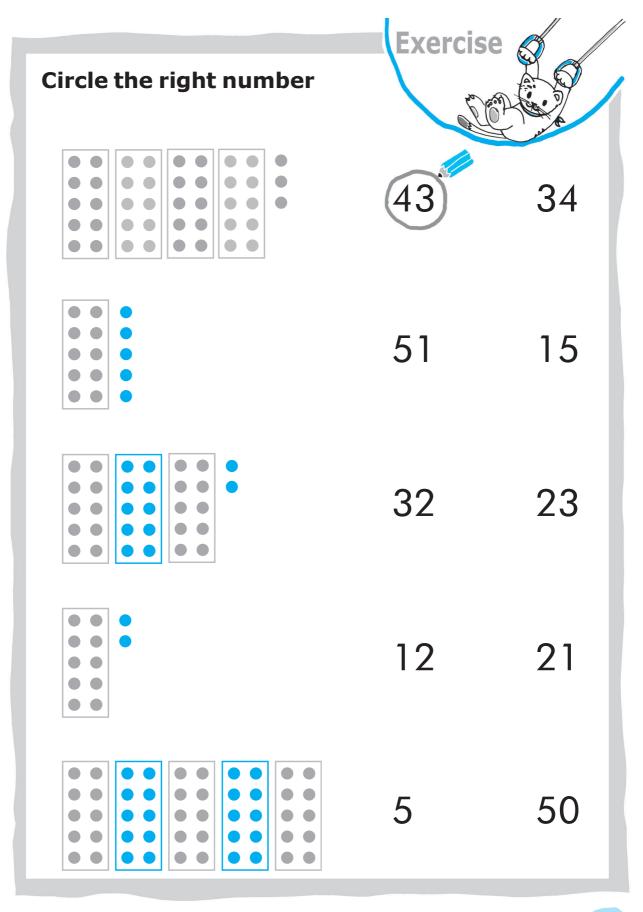
Wri	Writing practice 1 to 50										
1									10		
11									20		
21									30		
31									40		
41									50		
		3							10		
	12						18				
				25							
31						37					
			44						50		



Unit 12 / Numbers 21 to 50



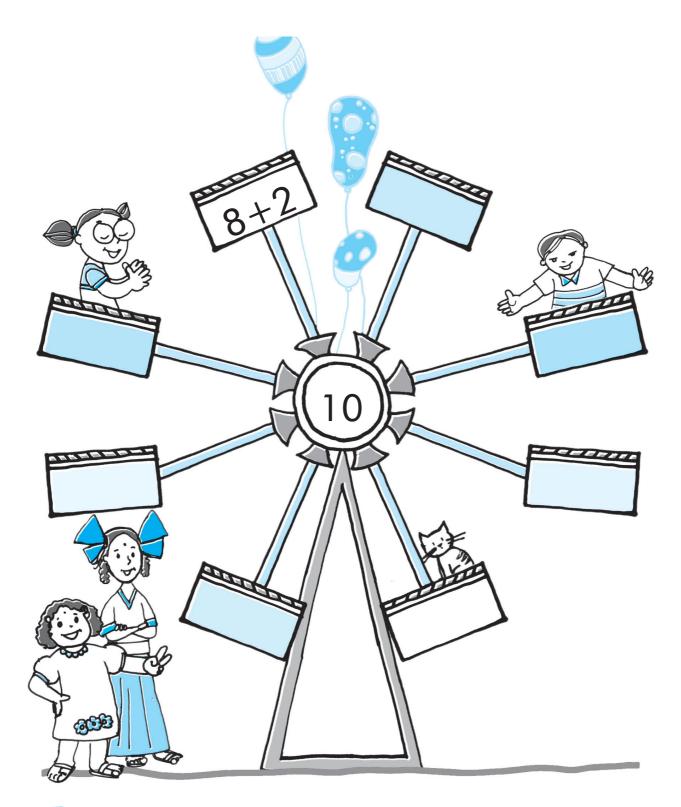




Unit 12 / Numbers 21 to 50

Making ten

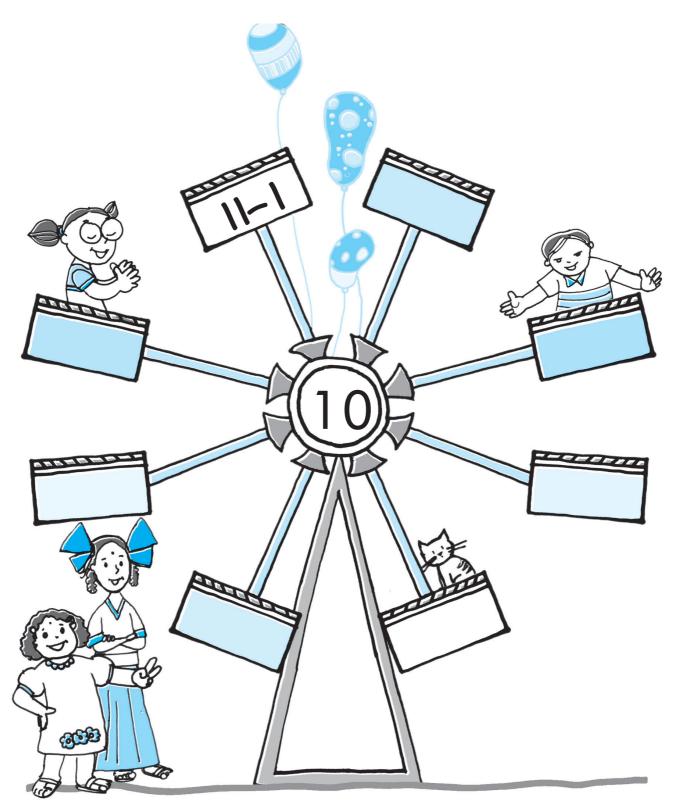
Write a different addition each time to make ten.

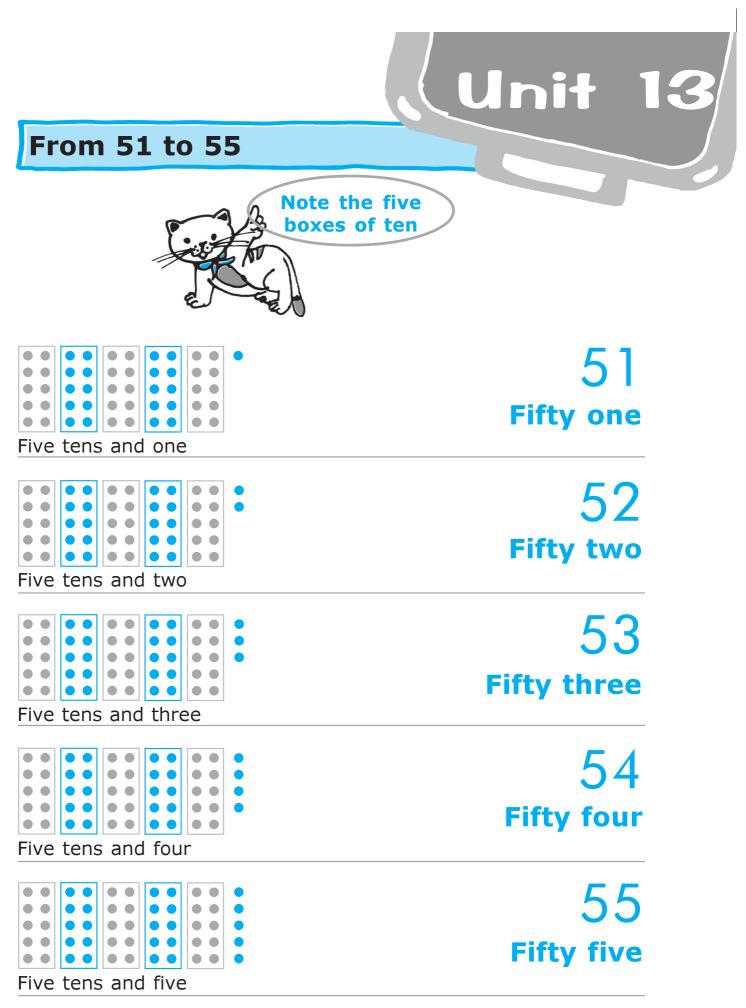




Making ten

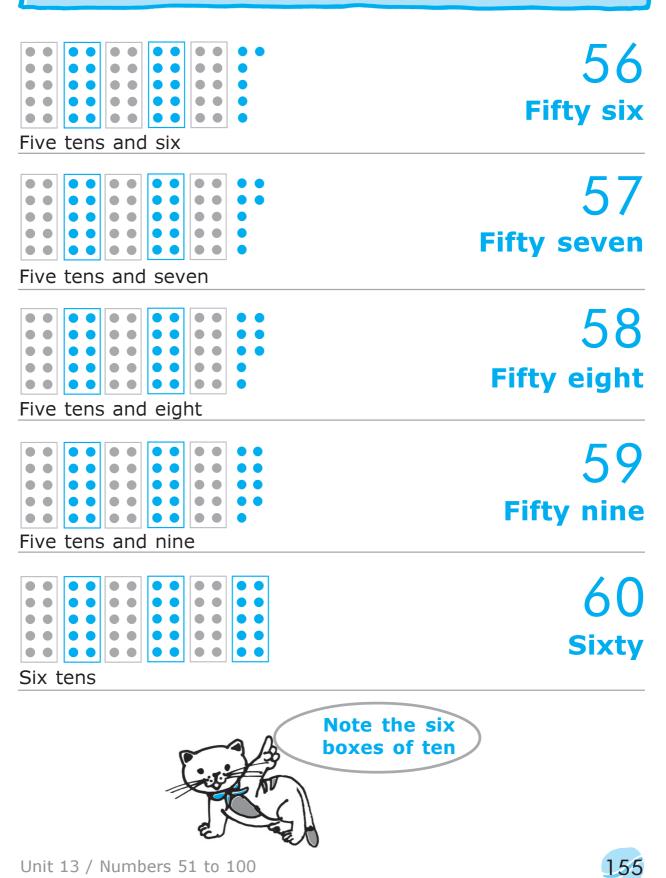
Write a different subtraction each time to make ten.





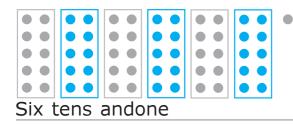


From 56 to 60



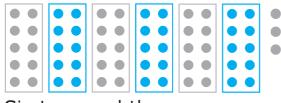
From 61 to 65



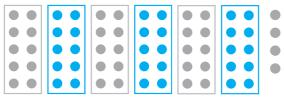


	$\bullet \bullet$		$\bullet \bullet$		
				$\bullet \bullet$	
				$\bullet \bullet$	
		$\bullet \bullet$		$\bullet \bullet$	
				$\bullet \bullet$	
	· · ·				

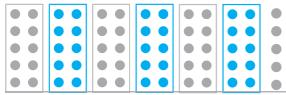
Six tens and two



Six tens and three



Six tens and four



Six tens and five



Unit 13 / Numbers 51 to 100

61

62

63

64

65

Sixty one

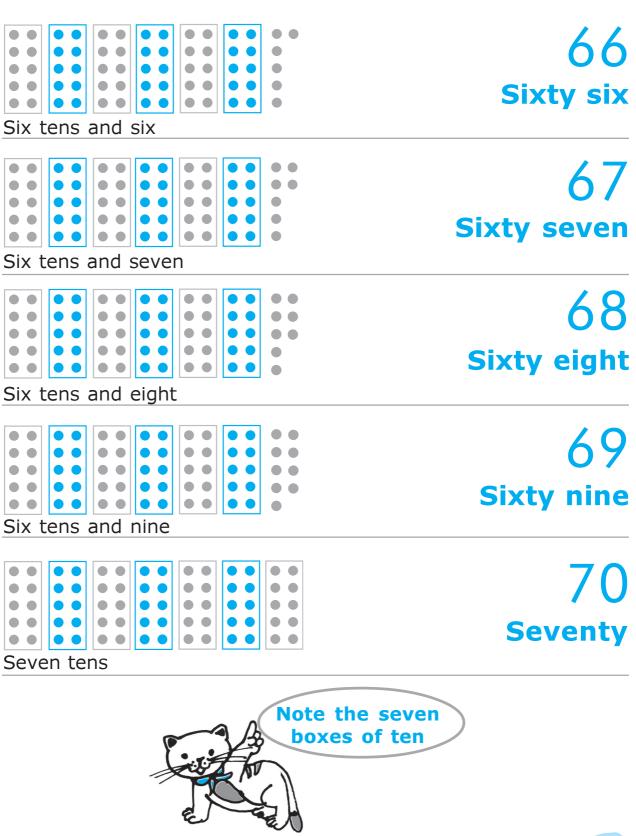
Sixty two

Sixty three

Sixty four

Sixty five

From 66 to 70



From 71 to 75

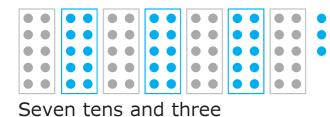


	$\bullet \bullet$		$\bullet \bullet$					
				\bullet				
				\bullet				

Seven tens and one

	$\bullet \bullet$	$\bullet \bullet$			
			\bullet		
			\bullet		
				$\bullet \bullet$	
$\bullet \bullet$	$\bullet \bullet$	$\bullet \bullet$		$\bullet \bullet$	

Seven tens and two



•• •• • • • • \bullet \bullet \bullet \bullet

Seven tens and four



Seven tens and five



71

72

73

74

75

Seventy one

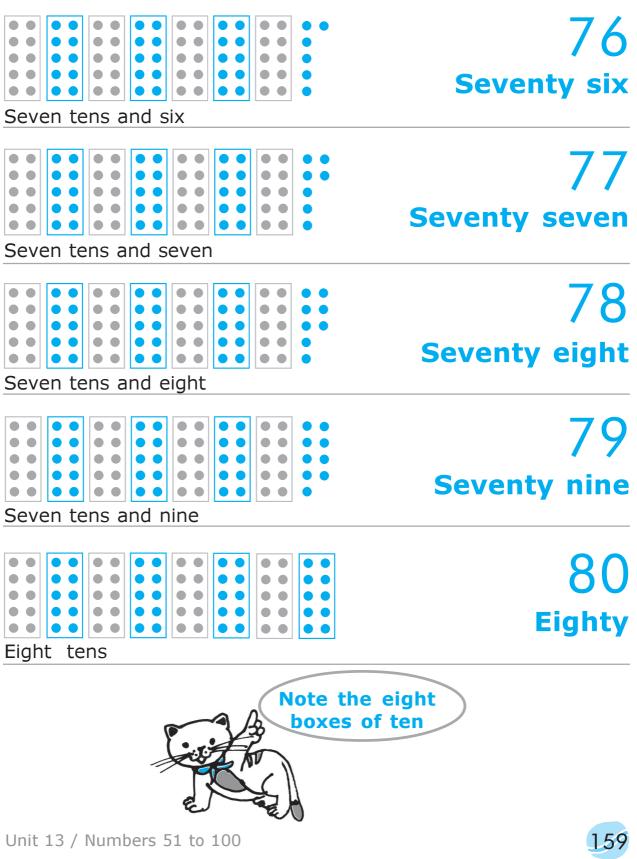
Seventy two

Seventy three

Seventy four

Seventy five

From 76 to 80

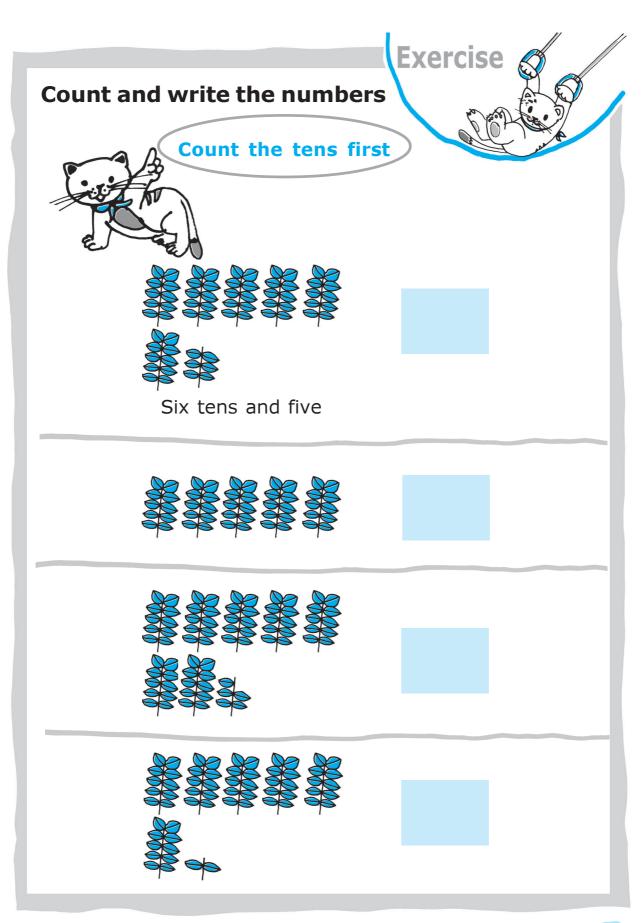


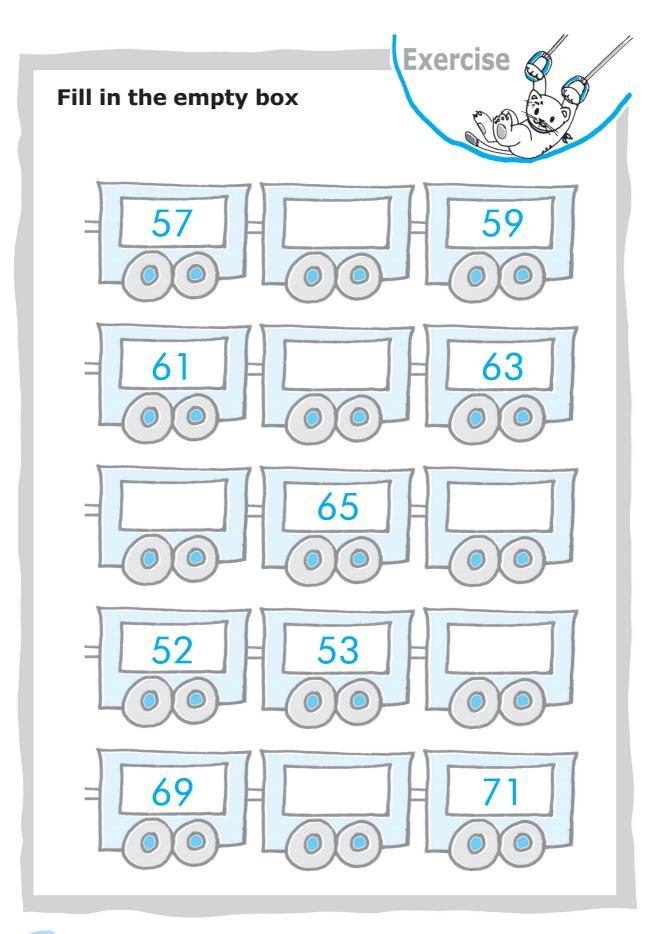
Writing 51 to 80

51	52	53	54	55	56	57	58	59	60
51			54						60
	52						58		
51									

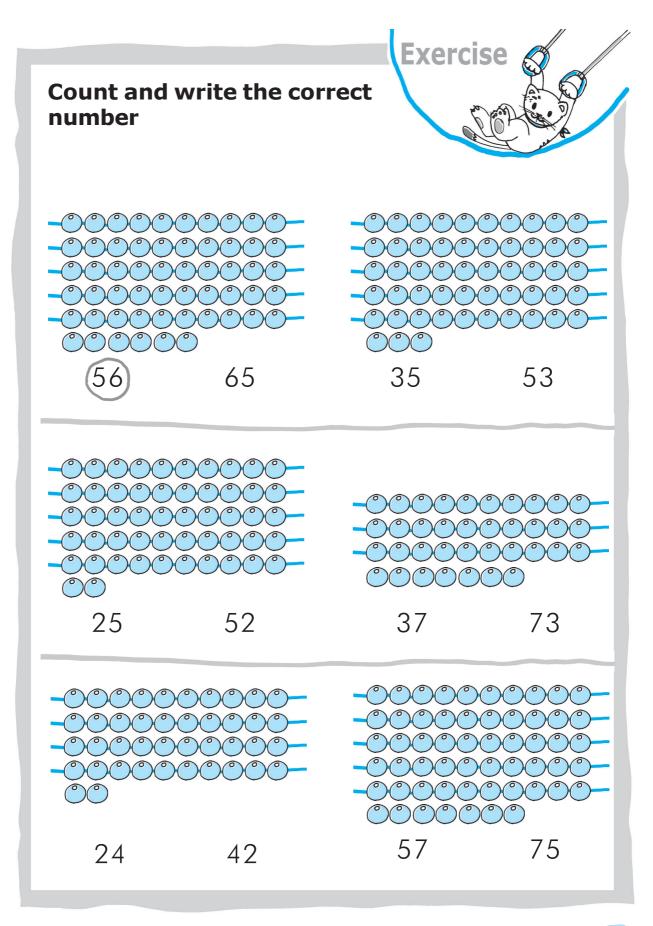
61	62	63	64	65	66	67	68	69	70
61			64						70
61						67			
				65					

71	72	73	74	75	76	77	78	79	80
71						77			
		73							80
71									

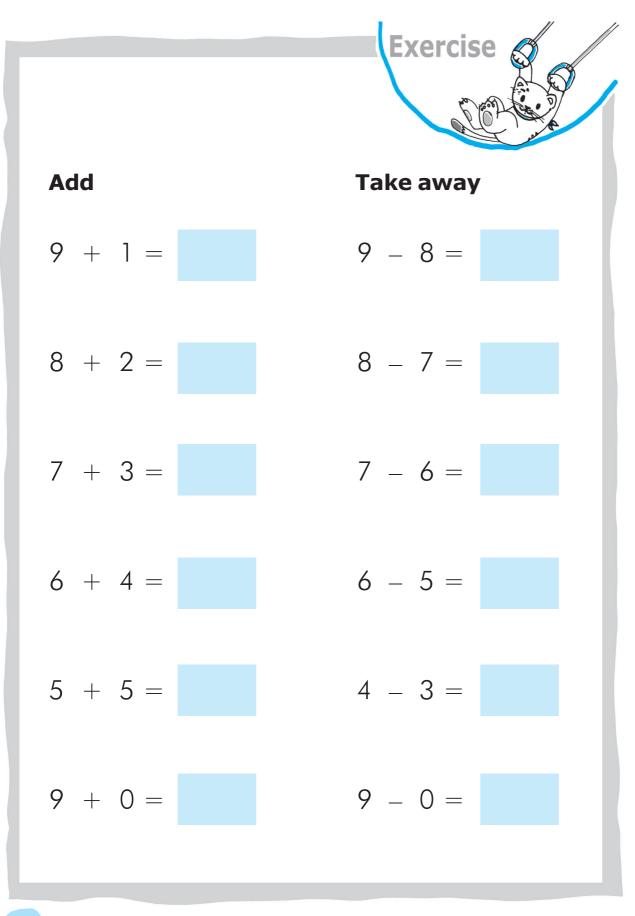




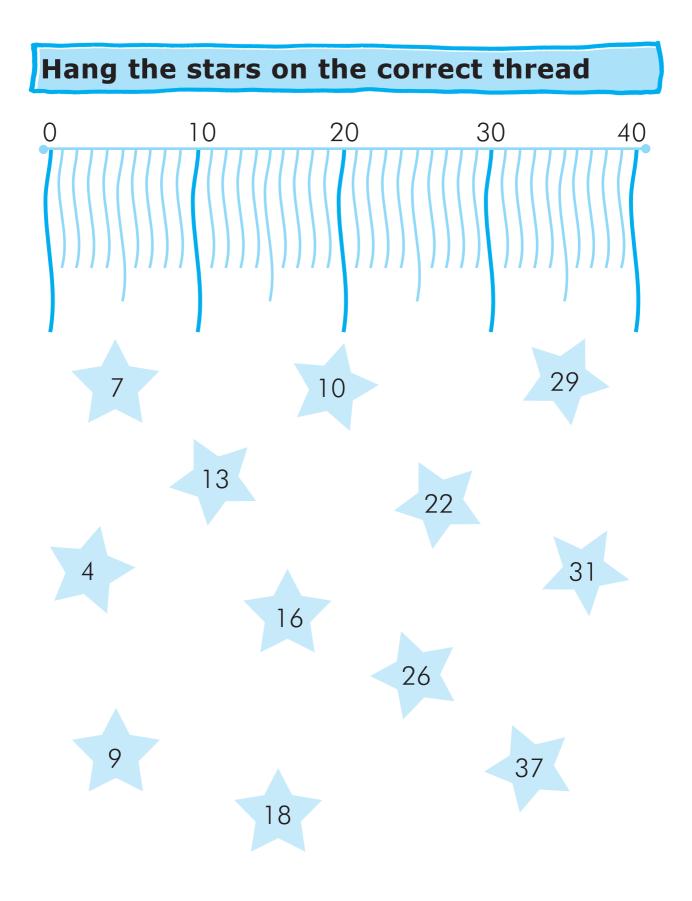




Unit 13 / Numbers 51 to 100



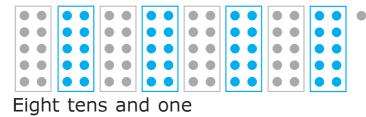
Unit 13 / Numbers 51 to 100



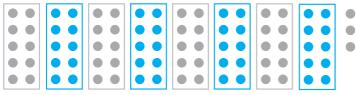


From 81 to 85

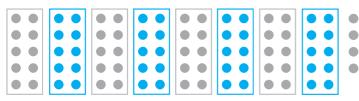




Eight tens and two



Eight tens and three



Eight tens and four

• • \bullet • •

Eight tens and five



81

82

83

84

85

Eighty one

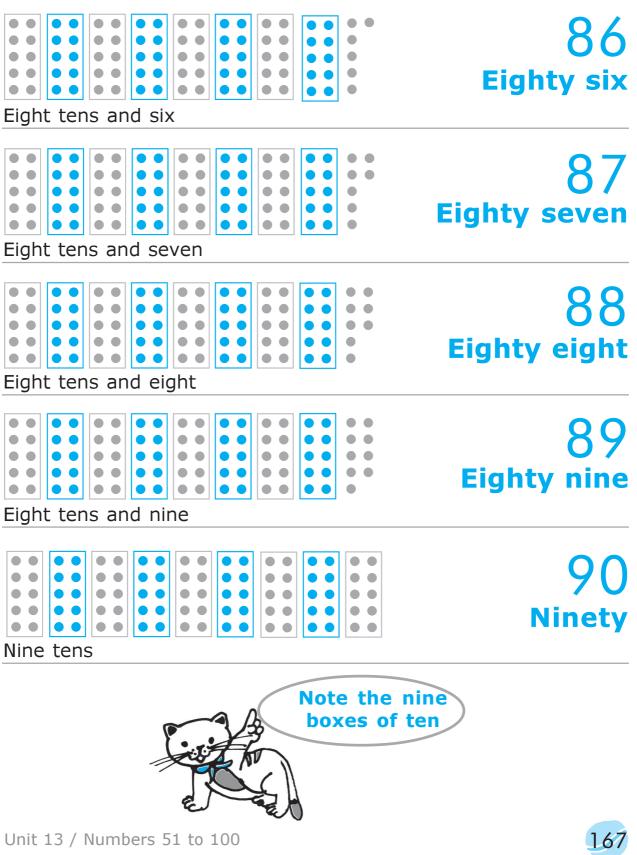
Eighty two

Eighty three

Eighty four

Eighty five

From 85 to 90



From 91 to 95

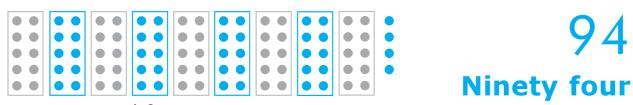


$\left[\begin{array}{cccccccccccccccccccccccccccccccccccc$	• 91
ns and one	Ninety one

	• 92
	Ninety two

Nine tens and two

	••• •••		•• •• ••	•• ••	•• •• ••	•• ••	•	93
Nine			••	••	••	••		Ninety three



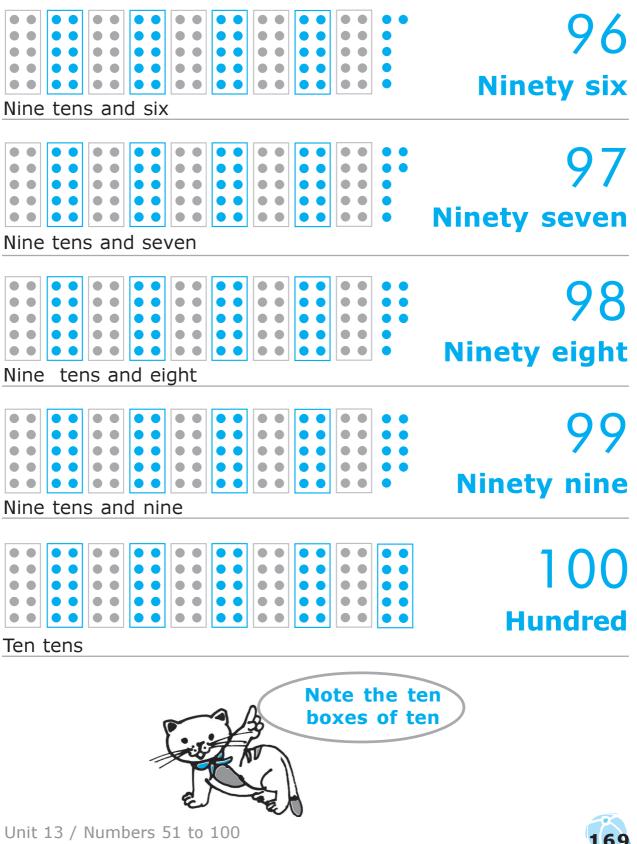
Nine tens and four

		• Ninety five
	• • • • • • • • • • • • •	95
		: 05

Nine tens and five



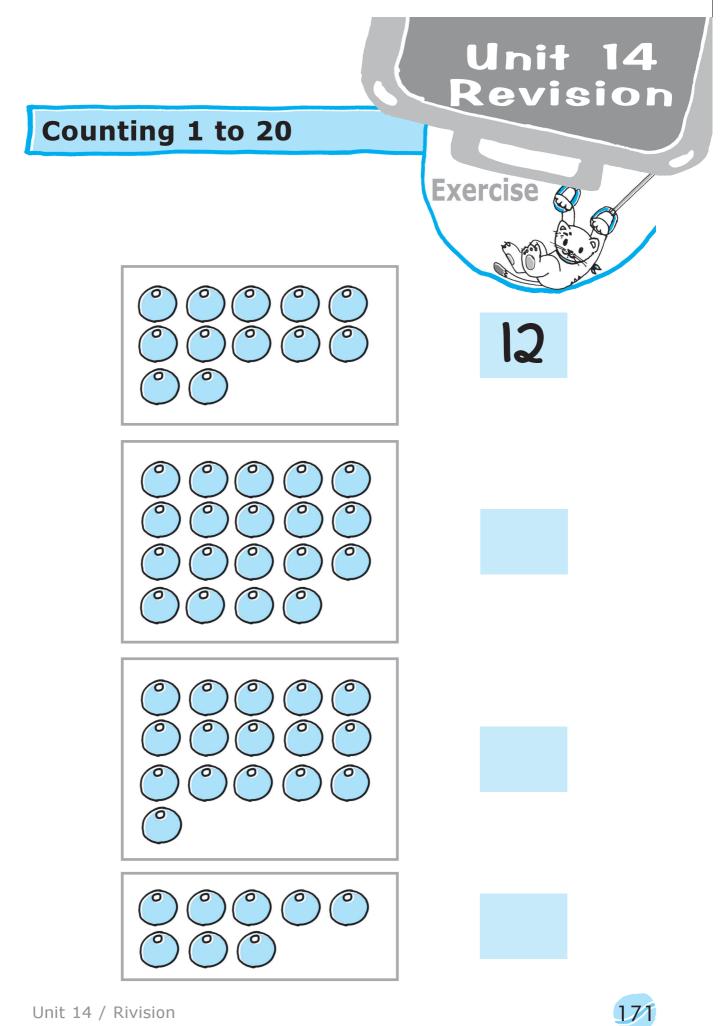
From 96 to 100



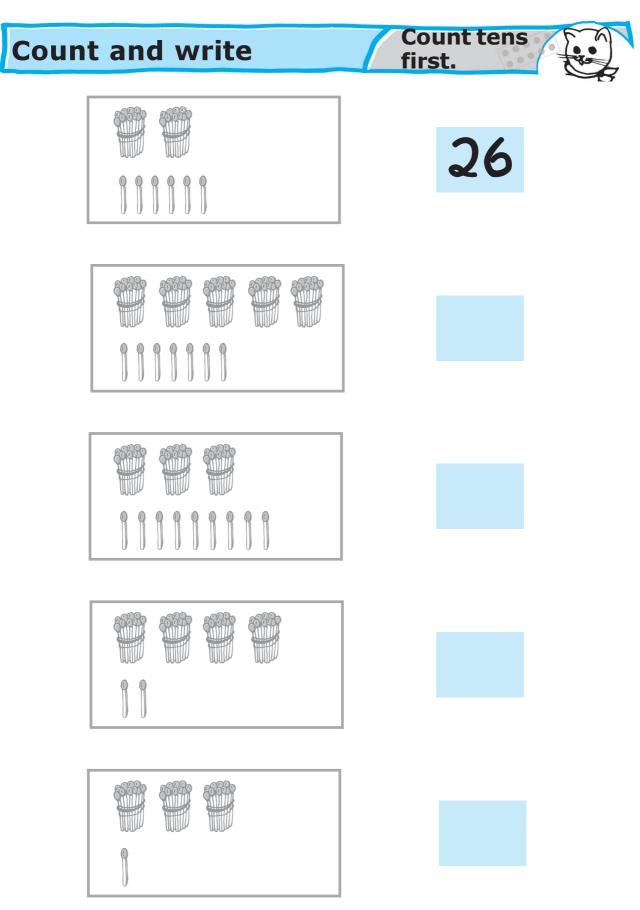
Write 1 to 100

1	2	3	Ч	5	6	7	8	9	10
11									20
21									30
31									40
41									50
51									60
61									70
71									80
81									90
91									100

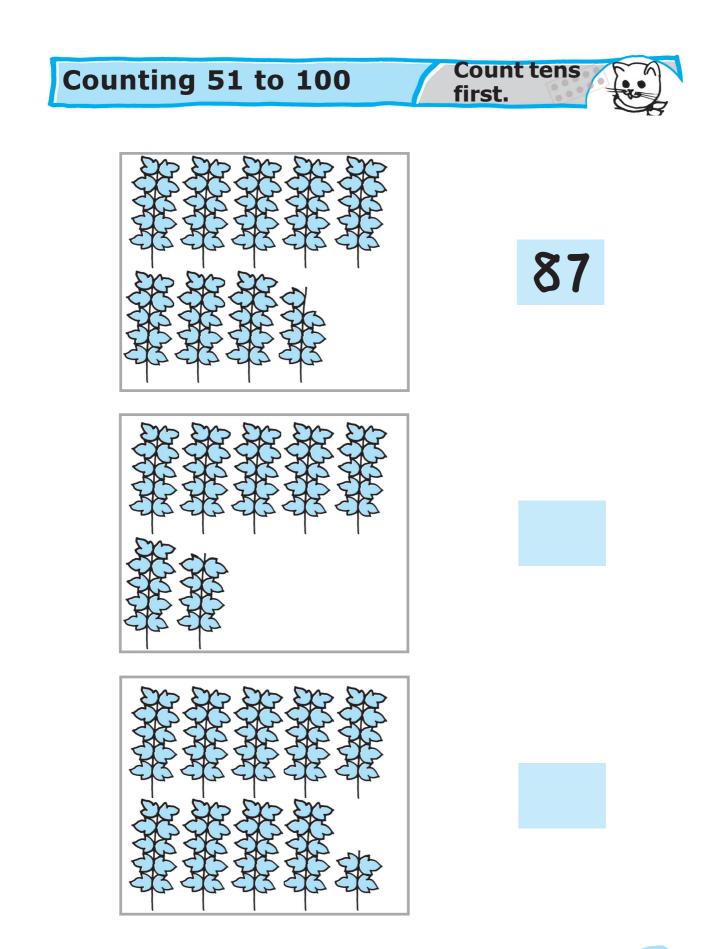




Unit 14 / Rivision

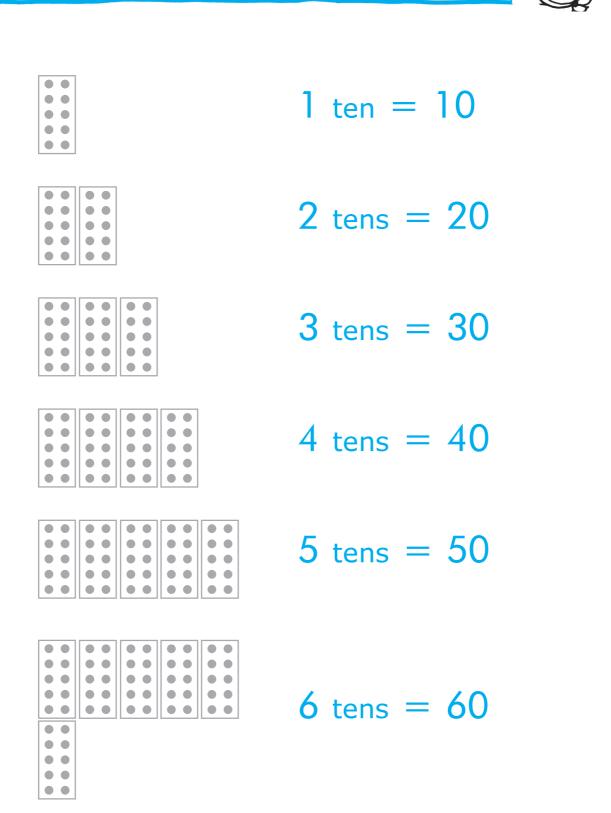


Unit 14 / Revision



Tens

Count in tens.





Tens

$\bullet \bullet$	$\bullet \bullet$	$\bullet \bullet$	$\bullet \bullet$	\bullet
$\bullet \bullet$				
$\bullet \bullet$	$\bullet \bullet$	$\bullet \bullet$	$\bullet \bullet$	
$\bullet \bullet$				

$\bullet \bullet$	$\bullet \bullet$	$\bullet \bullet$	$\bullet \bullet$	
$\bullet \bullet$				
$\bullet \bullet$				
$\bullet \bullet$				
••				
	••			

			\bullet
			$\bullet \bullet$
			$\bullet \bullet$
			$\bullet \bullet$
		$\bullet \bullet$	
••			

| $\bullet \bullet$ |
|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | | | |
| $\bullet \bullet$ | | | | |
| $\bullet \bullet$ | | | | |
| $\bullet \bullet$ |
| $\bullet \bullet$ |
$\bullet \bullet$				

7 tens = 70

8 tens = 80

9 tens = 90

10 tens = 100



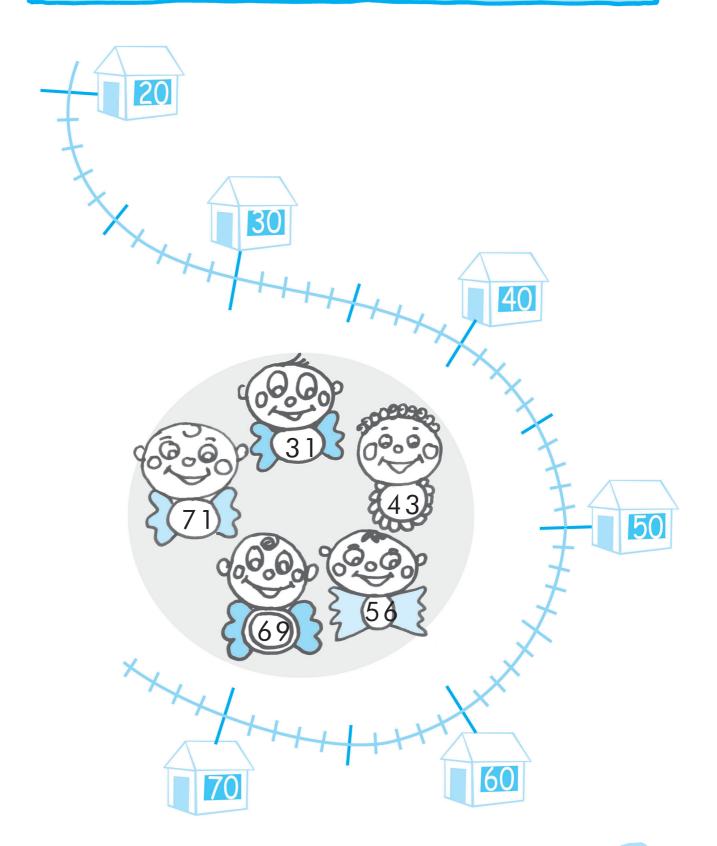
Counting in tens



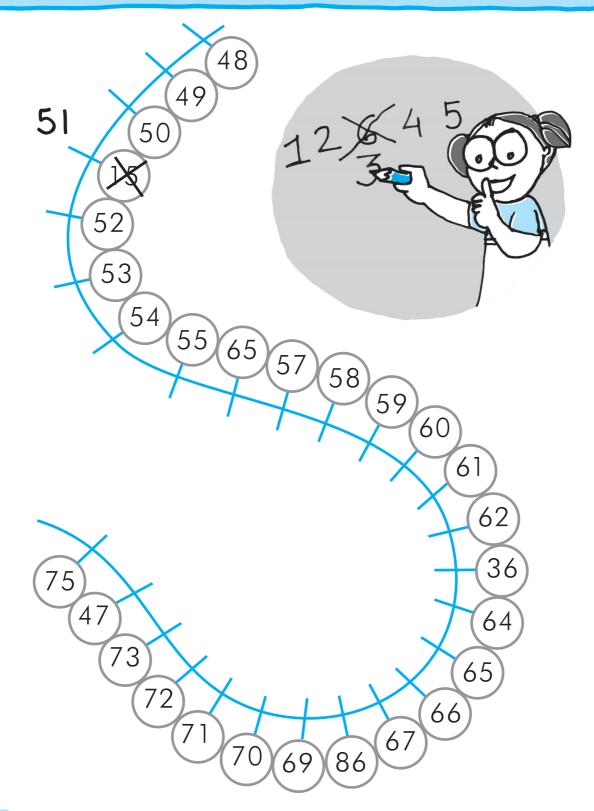


Unit 14 / Revision

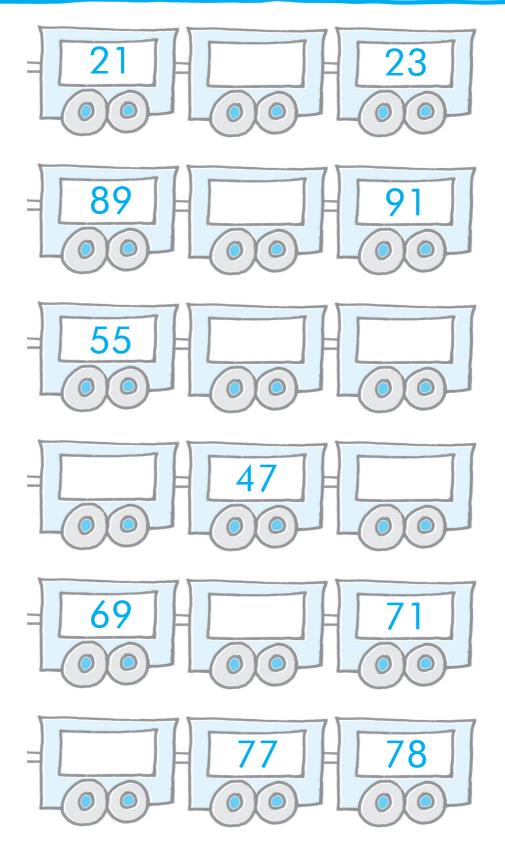
Send a joker to his correct place



Find the wrong number and correct them.



Fill in the missing number

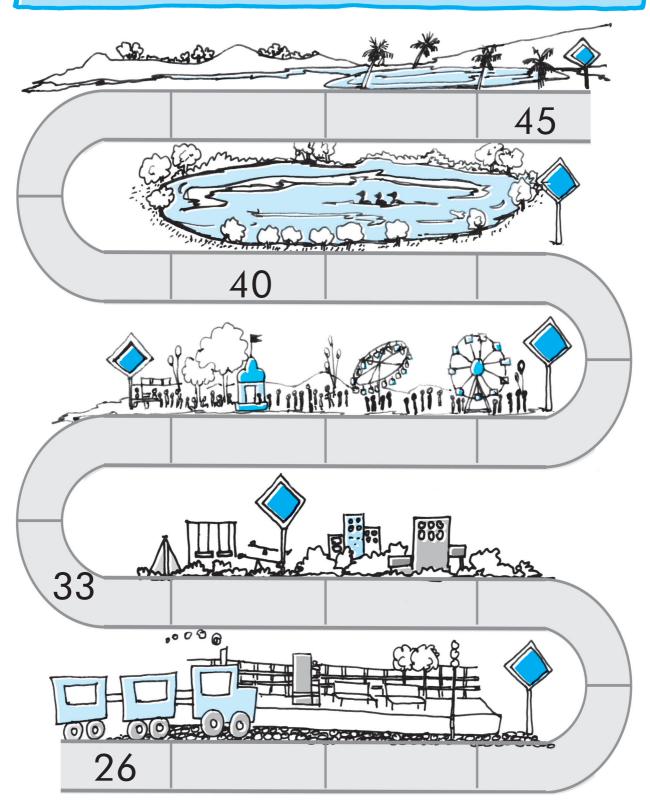


Count and circle the correct number

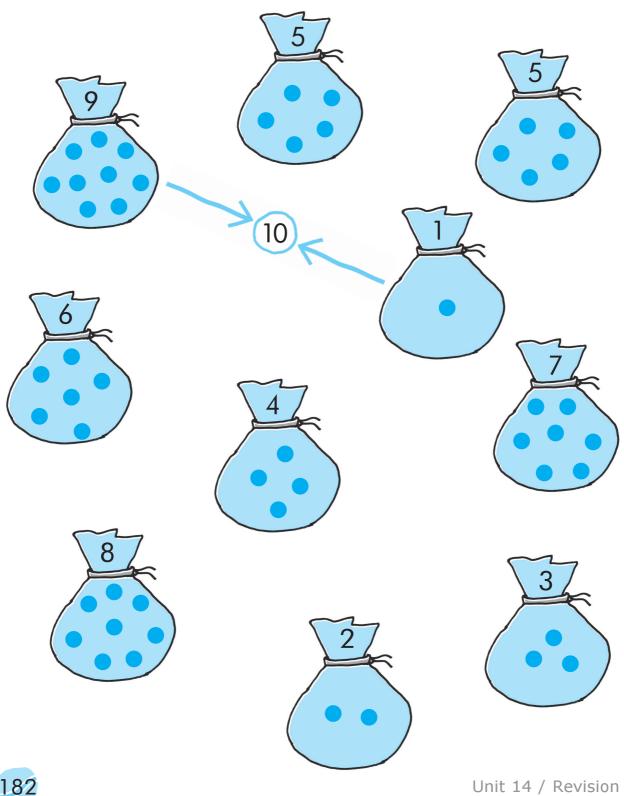




Number-tour

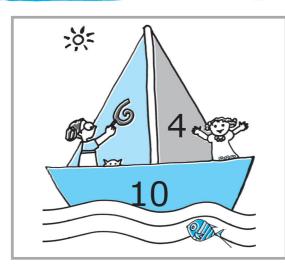


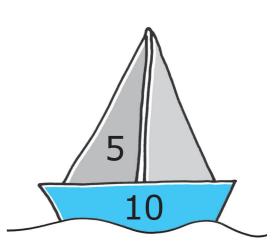
Join pairs which make ten

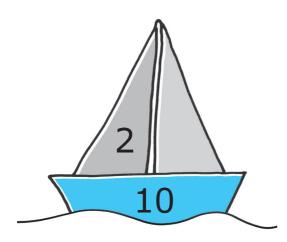


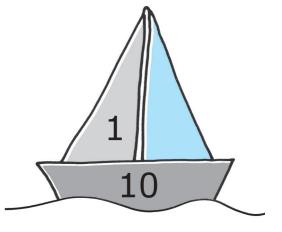
182

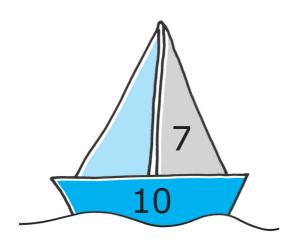
Write number on the ship to make ten

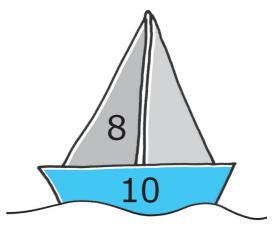








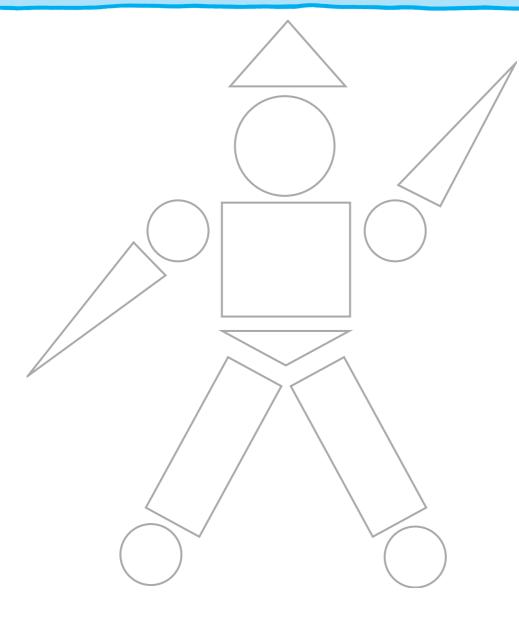




183

Unit 14 / Rivision

Join the shapes



How many quadrilaterals?

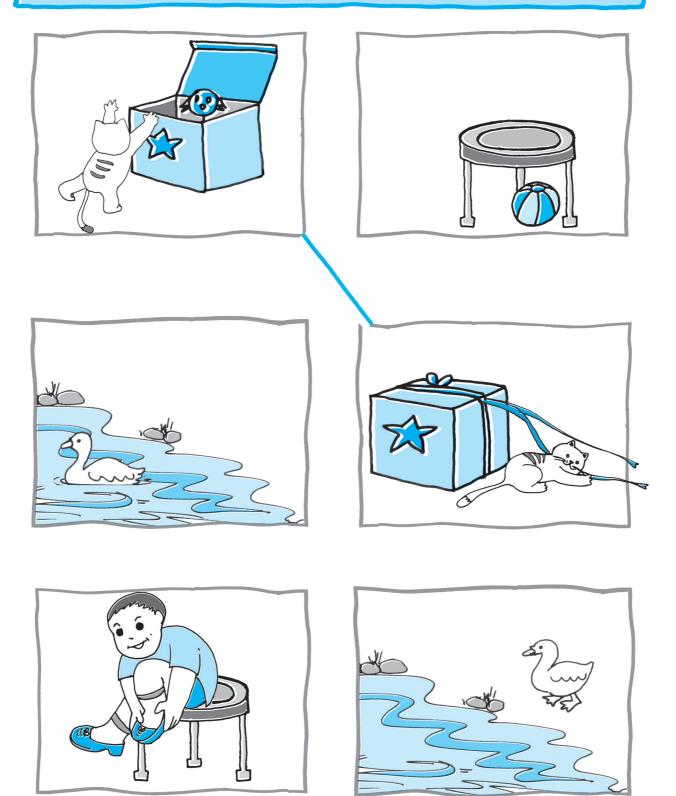
How many triangles?

How many circles?



Count	
Add	Take away
10 + 1 =	11 - 1 =
10 + 2 =	12 – 1 =
10 + 3 =	13 – 1 =
10 + 4 =	14 – 1 =
10 + 5 =	15 – 1 =
10 + 6 =	16 – 1 =
10 + 7 =	17 – 1 =
10 + 8 =	18 – 1 =
10 + 9 =	19 - 1 = What is the pattern?
E	AD A

Join opposites





Add

$$5 + 7 = 10 + 5 = 10$$

$$6 + 6 = 12 + 7 = 12$$

$$4 + 9 = 15 + 4 = 13$$

$$5 + 3 = 13 + 6 = 12$$

$$8 + 7 = 11 + 7 = 12$$

$$9 + 2 = 18 + 0 = 12$$

$$3 + 8 = 16 + 2 = 12$$

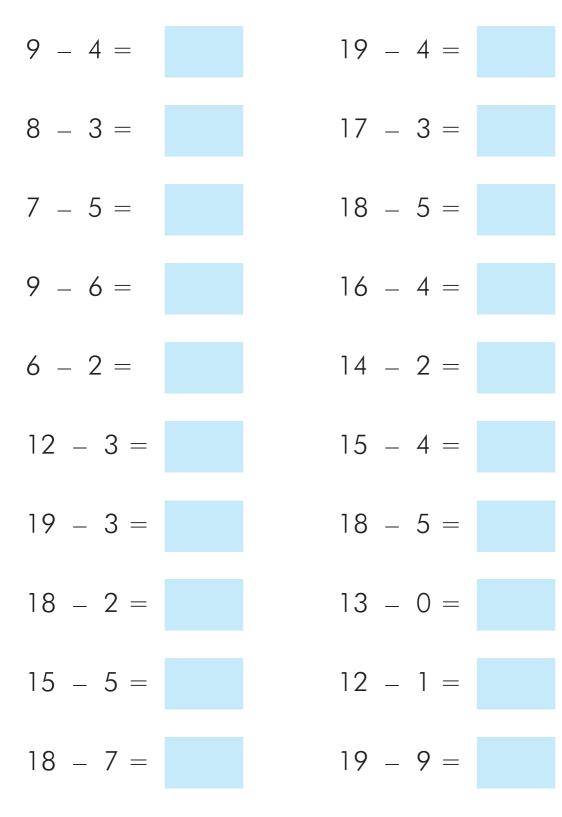
$$5 + 5 = 14 + 3 = 12$$

$$6 + 8 = 10 + 8 = 12$$

$$4 + 7 = 15 + 4 = 12$$

187

Take away





Unit 14 / Revision

Add

189

Colour the shapes

