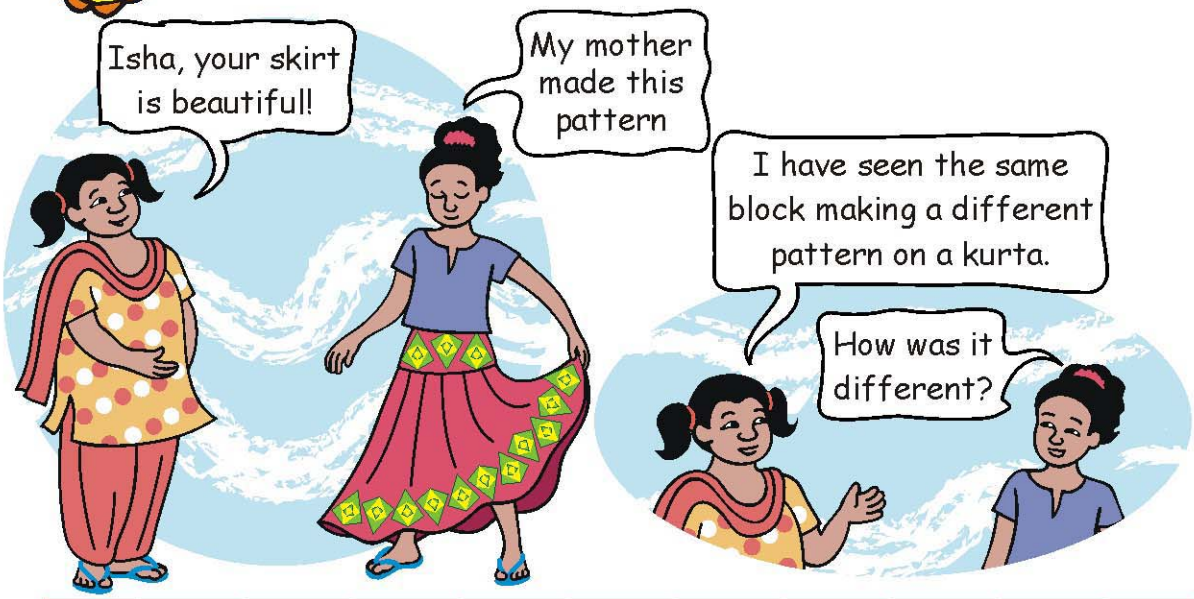
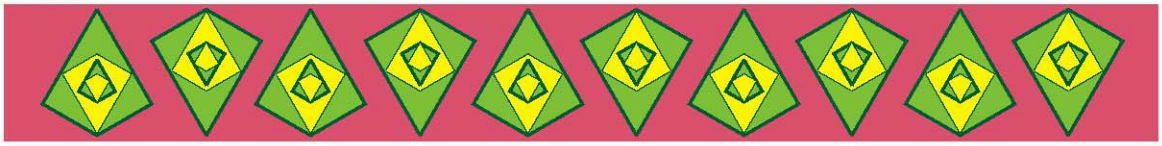
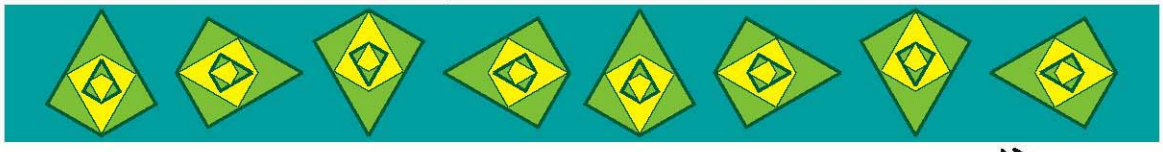
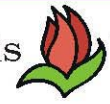
7 Can You See the Pattern?







Now you use these two rules to make patterns with this  block.

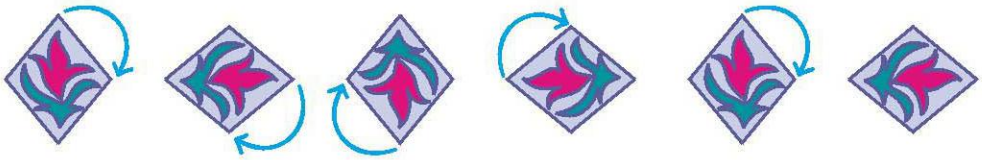
Also make your own rule.

In Math-Magic Class IV (page 107- 108) , children have seen how one motif is used in 3 different ways and in Class III (page 145), the same sequence of motifs is repeated. Discuss how the motif here turns clockwise.

Turns and Patterns

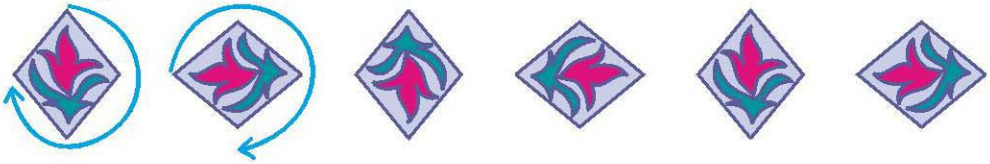
Look at this block  . We make three different rules to turn it clockwise and see the patterns.

Rule 1: Repeat it with a one-fourth turn.



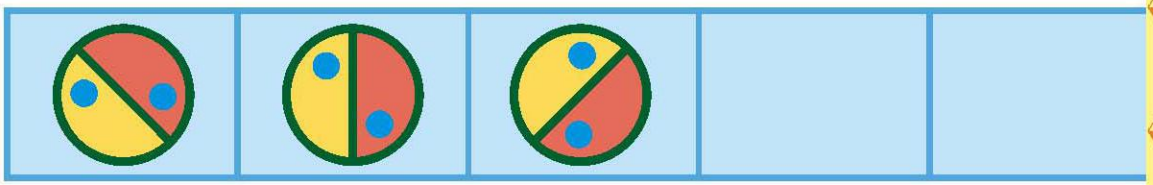
Rule 2: Repeat it with a half turn.

Rule 3: Repeat it with a three-fourth turn.



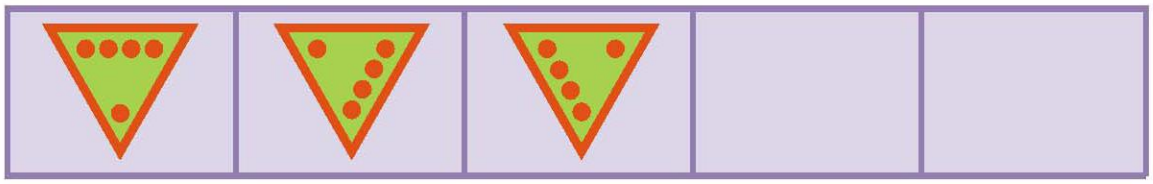
Practice time

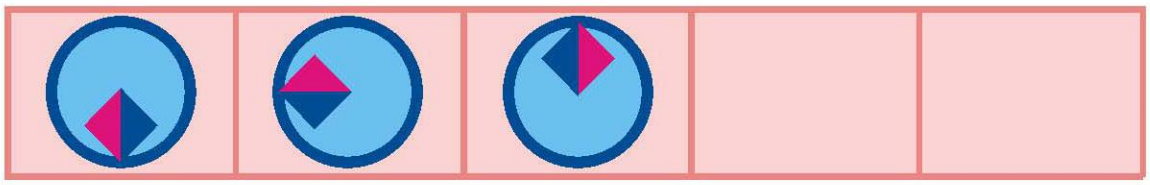
1) What should come next?

a) 

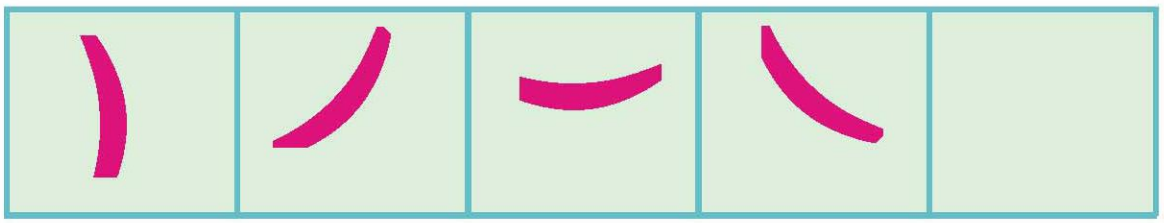
b) 

Encourage children to think of other alternatives. Answers obtained by anticlockwise turns should also be accepted and discussed.

c) 

d) 

2) See this pattern

a) 

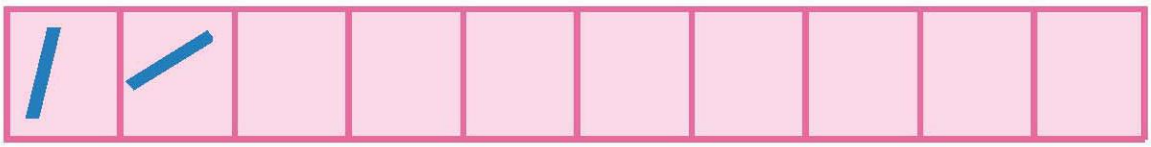
The **rule** of the pattern is — turning by 45° each time. Which will be the next? Tick (✓) the right one.

 ( )

 ( )

 ( )

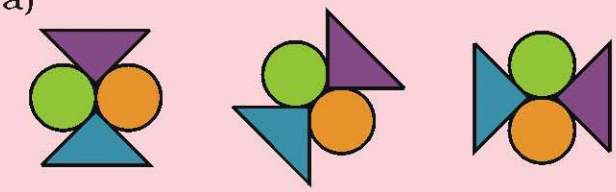
Using the same rule take it forward till you get back to what you started with.

b) 

c) 

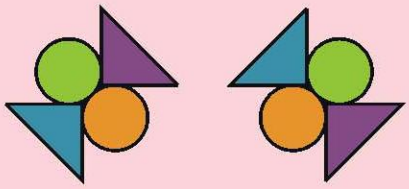
3) Some patterns are given below on the left side of the red line. For each pattern, write the rule. Then choose what comes next from the right side of the line and tick (✓) it.

a)



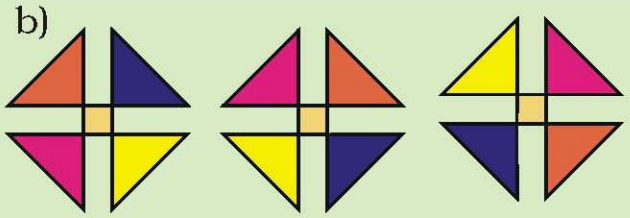
Rule: _____

_____



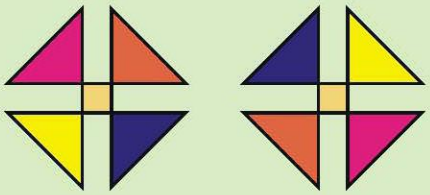
( ) ( )

b)



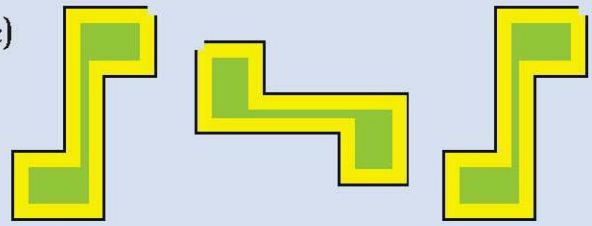
Rule: _____

_____



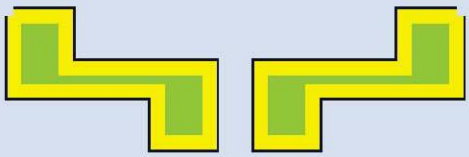
( ) ( )

c)



Rule: _____

_____

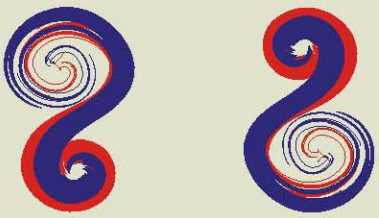


( ) ( )

d)

Rule: _____

_____



( ) ( )

Look for a Pattern

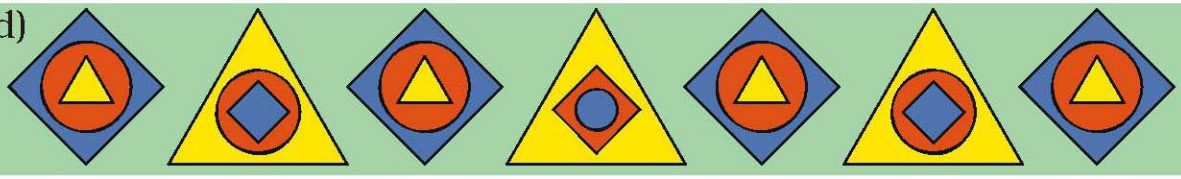
Mark that picture which is breaking the rule. Also correct it.

a)

b)

c)

d)



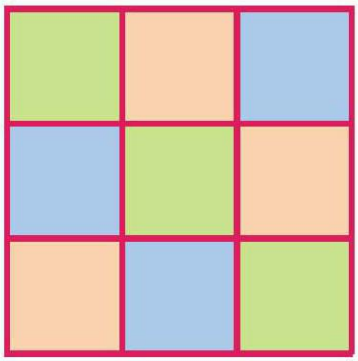
Magic Squares

Do you remember magic triangles? Come now, let's make some magic squares.

		49
46		
	52	47

* Fill this square using all the numbers from 46 to 54.

  Rule: The total of each line is 150.



* Fill this square using all the numbers from 21 to 29.

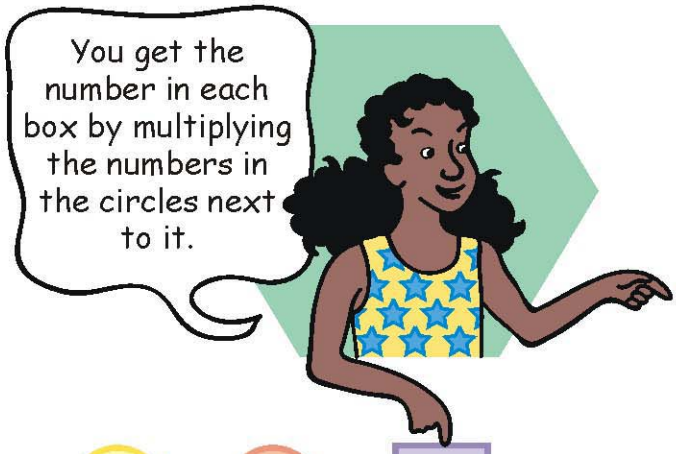
  Rule: The total of each side is 75.

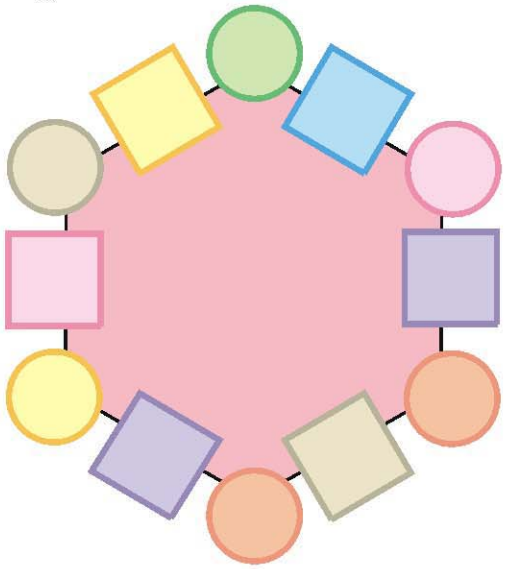
You can see Math-Magic Class IV (page 11) for similar magic patterns.

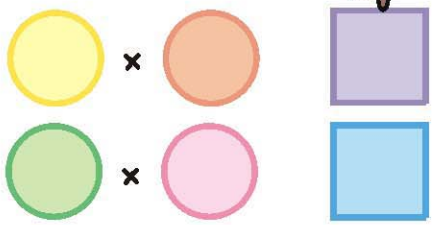
Magic Hexagons

Look at the patterns of numbers in hexagons.

Each side has 2 circles and 1 box.





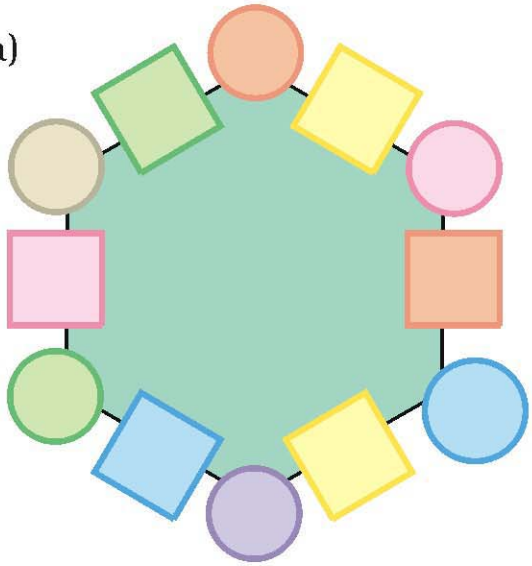


Look at the number 65 in the box.
Which are the circles next to it?

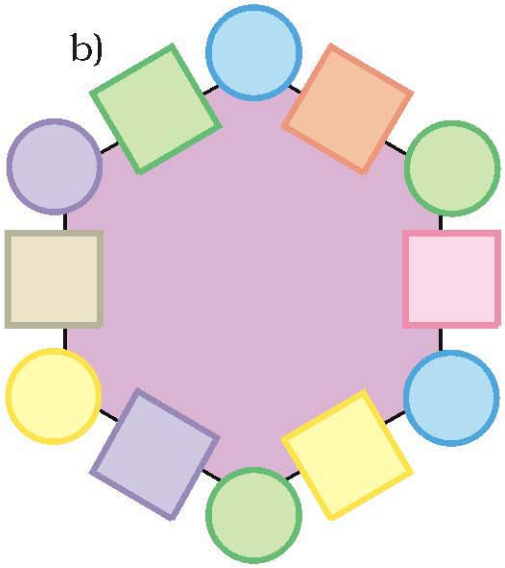
Can you see how the rule works?

* Use the same rule to fill the hexagons below.

a)



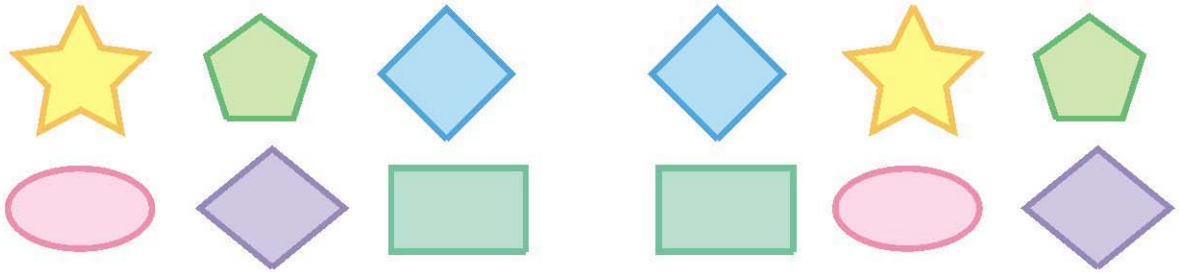
b)



Now you also make your own magic hexagons.

You can discuss that a hexagon is a six-sided closed figure, but this is not to be evaluated.

Numbers and Numbers



* Are they equal?

* Fill in the blank spaces in the same way.

a) 14 + ___ + ___ = 34 + 14 + 20

b) ___ + 42 + ___ = 65 + ___ + 80

c) 200 + 300 + ___ = ___ + 400 + ___

d) ___ + ___ + ___ = ___ + ___ + ___

* Now, look at this — 48 × 13 = 13 × 48

Check if it is true or not.

Left Right — Same to Same

Discuss with students that changing the order of numbers does not make any difference to the sum.

Take a number, say	43
Now turn it back to front	34
Then add them together	77

77 is one such special number. There are many such numbers.

You have **reversed** the number by writing it back to front.

Take another number		48
Now turn it back to front		84
Then add them together		132
Is this a special number?	No!	Why not?
OK, carry on with the number		132
Again turn it back to front		231
Then add the two together		363

Ah! 363 is a special number.

So we see that to get special numbers we sometimes need more steps.

❊ Now you try and change these numbers into special numbers —

a) 28 b) 132 c) 273

Now let's use words in a special way.

NO LEMONS NO MELON

STEP NOT ON PETS

Did you notice that it reads the same from both sides — right to left and left to right?

Now try and use words in a special way.

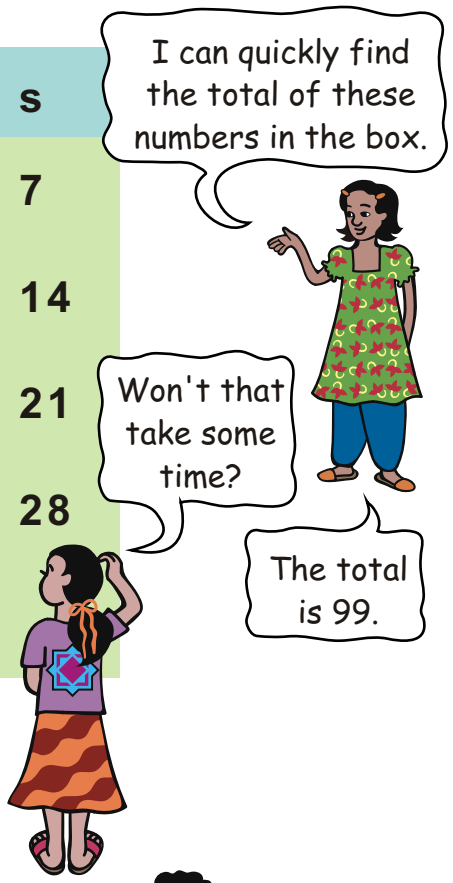
Special words/numbers which read the same both ways are called palindromes. Help children to read them from both the ends.

Calendar Magic

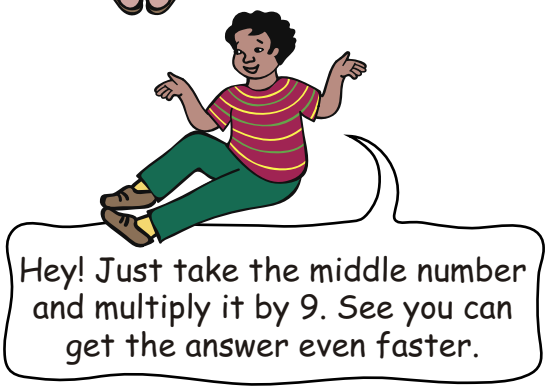
Look at the calendar below.

Let us mark a 3 × 3 box (9 dates) on the calendar and see some magic.

s	m	t	w	th	f	s
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				



Take the smallest number	3
Add 8 to it	+8
=	11
Multiply it by 9	×9
Total	99

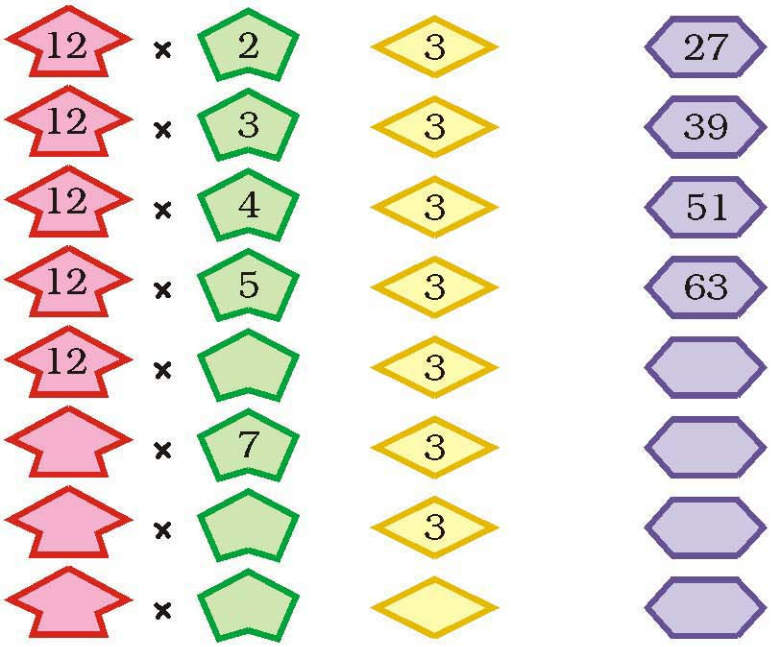


Now you choose any 3 × 3 box from a calendar and find the total in the same way. Play this game with your family.

You can see Math-Magic Class III (page 105 -106) for other calendar tricks.

Some more Number Patterns

- Take any number. Now multiply it by 2, 3, 4 ..... at every step. Also add 3 to it at each step. Look at the difference in the answer. Is it the same at every step?



Now try doing it with some other number and also take a different number to add at each step .

- Look at the numbers below. Look for the pattern. Can you take it forward?

(9 – 1) ÷ 8 = 1

(98 – 2) ÷ 8 = 12

(987 – 3) ÷ 8 = 123

(9876 – 4) ÷ 8 = ___

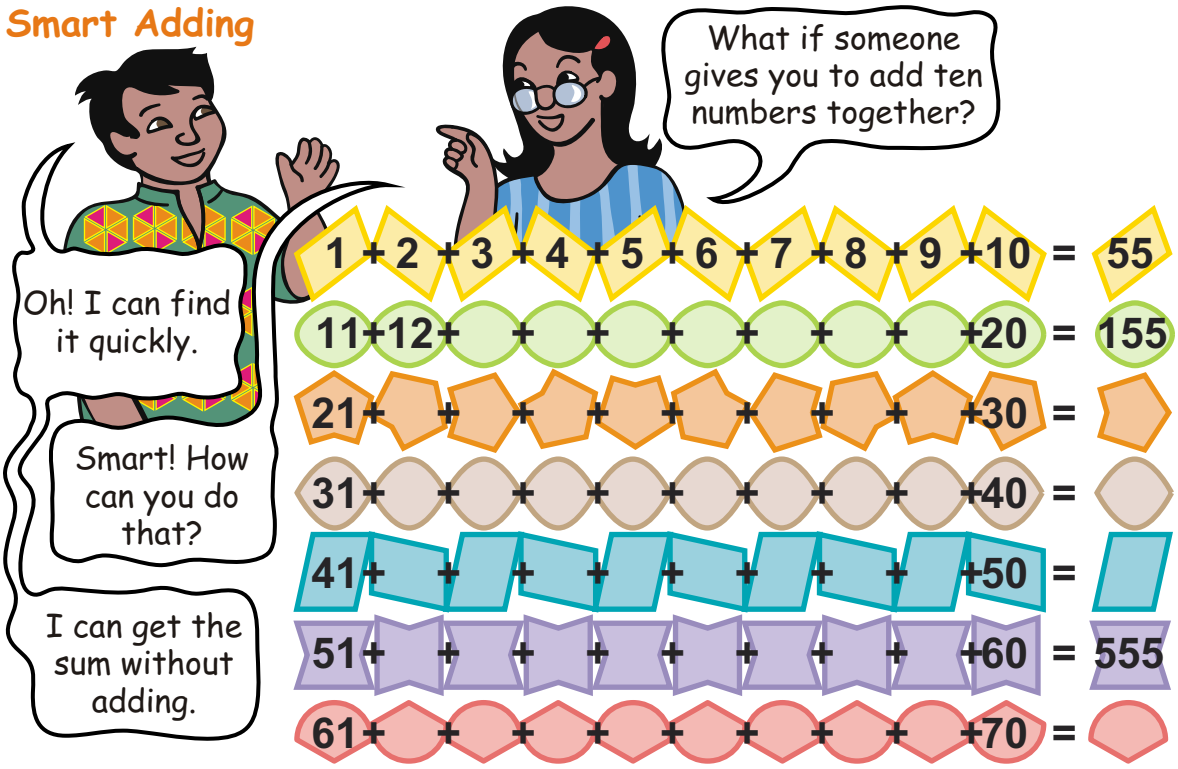
(98765 – 4) ÷ 8 = ___

(_____) ÷ 8 = ___

(_____) ÷ 8 = ___

Encourage children to read aloud the numbers on the left hand side, even if they can not read them correctly. Some of the numbers are large. To help children read them, recall the concept of 1 lakh or 100 thousand.

Smart Adding



❊ Did you notice some pattern in the answers?

Fun with Odd Numbers

Take the first two odd numbers. Now add them, see what you get.

Now, at every step, add the next odd number.

1 + 3 = 4 = 2 × 2

1 + 3 + 5 = 9 = 3 × 3

1 + 3 + 5 + 7 = 16 = 4 × 4

1 + 3 + 5 + 7 + 9 = = ×

1 + 3 + 5 + 7 + 9 + 11 = = ×

1 + 3 + 5 + 7 + 9 + 11 + 13 = = ×

How far can you go on?

When we add the first n odd numbers, we will get the sum as n × n . Children should be left free to add the numbers.

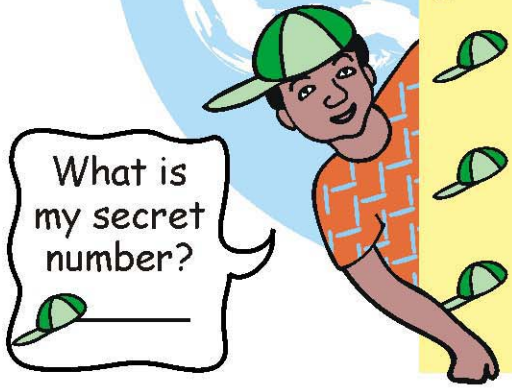
Secret Numbers

Banno and Binod were playing a guessing game by writing clues about a secret number. Each tried to guess the other's secret number from the clues.

Can you guess their secret numbers?

- It is larger than half of 100
- It is more than 6 tens and less than 7 tens
- The tens digit is one more than the ones digit
- Together the digits have a sum of 11

- It is smaller than half of 100
- It is more than 4 tens and less than 5 tens
- The tens digit is two more than the ones digit
- Together the digits have a sum of 6



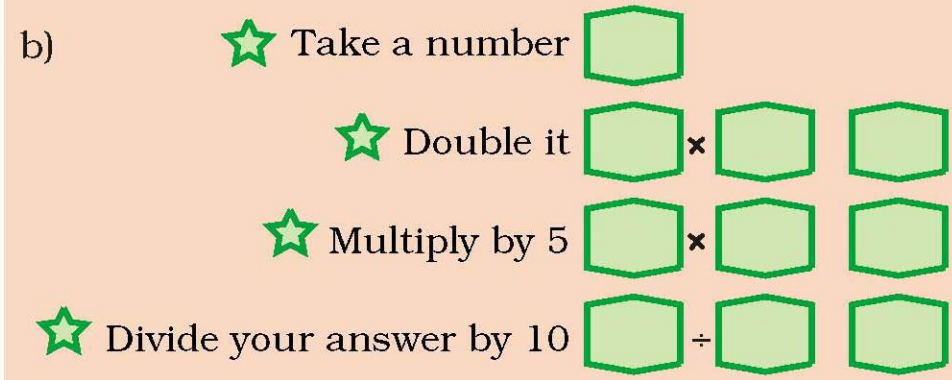
* Write a set of clues for a secret number of your own. Then give it to a friend to guess your secret number.

Number Surprises

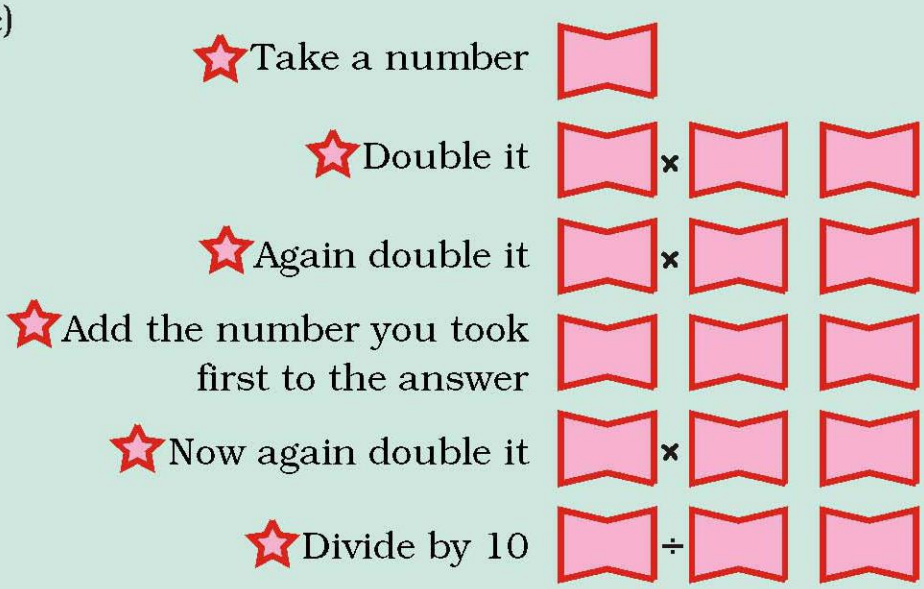
a) Ask your friend — Write down your age. Add 5 to it. Multiply the sum by 2. Subtract 10 from it. Next divide it by 2. What do you get?

Is your friend surprised?

b)



c)



d) Look at this pattern of numbers and take it forward.

$1 = 1 \times 1$

$121 = 11 \times 11$

$12321 = 111 \times 111$

$1234321 = ?$

❊ Now make your own number surprises.