Living Maths
at a glance

STRUCTURE OF THE BOOK

- The chapters follow the NCF guidelines and the latest trends in the teaching and learning of mathematics.
- Two sets of CHECK YOUR UNDERSTANDING with ENRICHMENT ACTIVITIES (questions, activities, brain teasers, projects and more).
- ANSWERS are provided at the end of the book.

STRUCTURE OF A CHAPTER

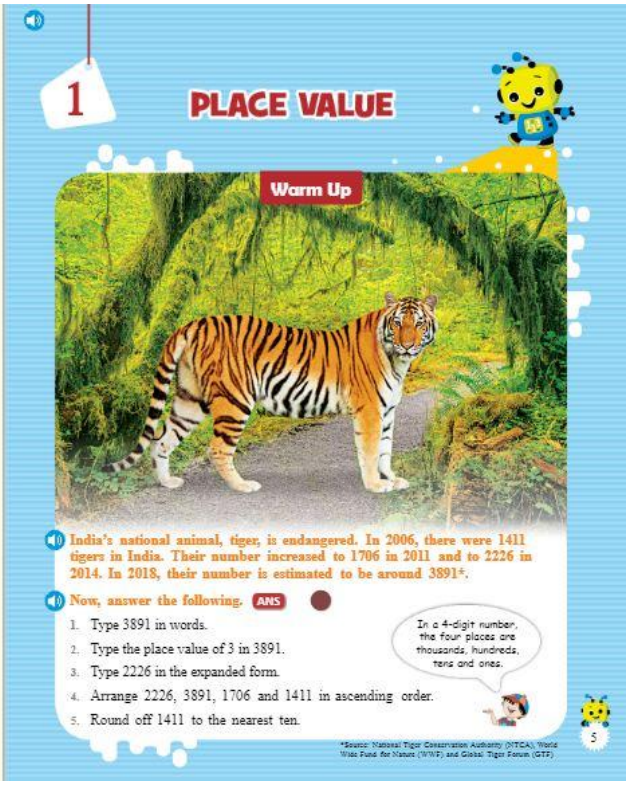
- WARM UP at the beginning of the chapter to help grasp the new concepts
- CONCEPTS that are well-graded and supported by solved examples
- Full-page MENTAL MATHS to sharpen mathematical skills
- Full-page MATHS LAB ACTIVITY to reinforce conceptual understanding
- Full-page WORKSHEET for practice and assessment

THERE'S MORE . . .

- QUICK TIPS
- GET IT RIGHT!
- HOTS QUESTIONS
- LIFE SKILLS
- VALUES
- SUBJECT LINKS
- PROJECTS

COMPONENTS OF THE TEACHER'S COMPANION

Teaching objectives • Teaching aids • Lesson plans • Expected learning outcomes
Suggested activities • Projects • Worksheets • Answers • Test papers



5-DIGIT NUMBERS

Which player was the first to make 10,000 runs in Test cricket?

Sunil Gavaskar. Is 10,000 a 5-digit number?

Yes, it is. 10,000 is the smallest 5-digit number.

When you add 1 to the largest 4-digit number, you get the smallest 5-digit number.

```
  9 9 9 9   ⟶ largest 4-digit number
+       1
-----------
  1 0 0 0 0 ⟶ smallest 5-digit number
```

Reading and writing 5-digit numbers

The place value system for numbers with 5 or more digits is divided into periods. Periods help in reading and writing large numbers.

PERIODS ⟶	THOUSANDS		ONES		
PLACES ⟶	Ten Thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)

The ONES period has three places, that is, Hundreds, Tens and Ones.

The THOUSANDS period has two places, that is, Ten thousands and Thousands.

EXAMPLE 1 Write 98153 in the place value system and rewrite it by marking its periods. Read it aloud.

THOUSANDS		ONES		
Ten Thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
9	8	1	5	3

To mark periods in 5-digit numbers, group the digits in the ones and thousands periods by using a comma.

With commas: 98,153

ninety-eight thousand — one hundred fifty-three

Another way you can mark periods is by leaving a thin space. For example, 98 153.

ANS. The number 98153 is written as 98,153.

It is read as ninety-eight thousand one hundred fifty-three.

Read the digits in the thousands period together. Follow it by reading the digits in the Ones period together.

EXAMPLE 2 Write 76125 in the place value system. Rewrite with commas to mark its periods and write it in words. Write the place value of each digit.

THOUSANDS		ONES		
Ten Thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
7	6	1	2	5

76,125 or seventy-six thousand one hundred twenty-five.

TTh	Th	H	T	O
7	6	1	2	5

PLACE VALUE

- 5 ones or 5
- 2 tens or 20
- 1 hundred or 100
- 6 thousands or 6000
- 7 ten thousands or 70000

EXAMPLE 3 Write the expanded form of 43,291.

The expanded form of a number is the sum of the place values of its digits.

TTh	Th	H	T	O
4	3	2	9	1

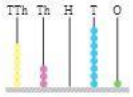
- 1 one or 1
- 9 tens or 90
- 2 hundreds or 200
- 3 thousands or 3000
- 4 ten thousands or 40000

43,291 = 4 ten thousands + 3 thousands + 2 hundreds + 9 tens + 1 one

ANS. 43,291 = 40,000 + 3,000 + 200 + 90 + 1

5-digit numbers on the abacus

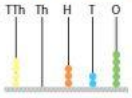
EXAMPLE 4 Represent 63,081 on the abacus. Read it aloud.

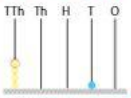


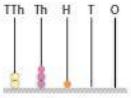
63,081 is read as sixty-three thousand eighty-one.

I Can Do It!

A. Look at the abacus and type the number. ANS

1. 

2. 

3. 

B. Click to represent these numbers on the abacus. ANS

1. 47,026 2. 20,002 3. 80,005 4. 31,981

C. Mark the periods using commas and type in words. ANS

1. 36382 2. 71995 3. 10467 4. 66163

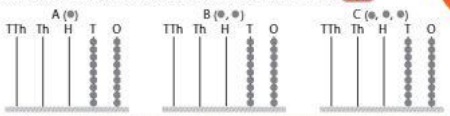
D. Type the expanded form of 42, 981. _____ ANS

E. Type the standard form of 50,000 + 3,000 + 400 + 50 + 3. _____ ANS

HOTS Questions

Click and place the beads given in brackets in A, B and C such that the number formed in A is the greatest and that formed in C is the least. ANS

A (●) B (●, ●) C (●, ●, ●)



6-DIGIT NUMBERS

I know that 99,999 is the largest 5-digit number. What is 99,999 + 1?

```
  9 9, 9 9 9   ⟶ largest 5-digit number
+         1
-------------
1, 0 0, 0 0 0   ⟶ smallest 6-digit number
```

Writing 6-digit numbers in the place value system

A period called LAKHS is used for writing a 6-digit number.

EXAMPLE 5 Write 100000 in the place value system and read it aloud.

PERIODS ⟶	LAKHS	THOUSANDS		ONES		
PLACES ⟶	Lakhs (L)	Ten thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
	1	0	0	0	0	0

The number 100000 is read as one lakh.

Marking periods in 6-digit numbers

Start at the ones place. Group the digits in ones, thousands and lakhs using commas.

EXAMPLE 6 Mark periods in 348156 and rewrite it. Read it aloud.

LAKHS	THOUSANDS		ONES		
Lakhs (L)	Ten thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
3	4	8	1	5	6

With commas: 3 , 48 , 156

three lakh — forty-eight thousand — one hundred fifty-six

In words: three lakh forty-eight thousand one hundred fifty-six

EXAMPLE 7 Write the place value of each digit in 834621.

L	TTh	Th	H	T	O
8	3	4	6	2	1

- 1 one or 1
- 2 tens or 20
- 6 hundreds or 600
- 4 thousands or 4000
- 3 ten thousands or 30000
- 8 lakhs or 800000

EXAMPLE 8 Write the expanded form of 3,98,672.

L	TTh	Th	H	T	O
✓	9	8	6	7	2

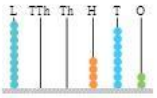
- 2 ones or 2
- 7 tens or 70
- 6 hundreds or 600
- 8 thousands or 8000
- 9 ten thousands or 90000
- 3 lakhs or 300000

3, 98, 672 = 3 lakhs + 9 ten thousands + 8 thousands + 6 hundreds + 7 tens + 2 ones

ANS. 3, 00, 000 + 90,000 + 8,000 + 600 + 70 + 2

6-digit numbers on the abacus

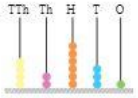
EXAMPLE 9 Represent 9,00,482 on the abacus. Read it aloud.

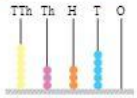


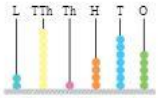
ANS. 9, 00, 482 is read as nine lakh four hundred eighty-two.

Exercise 1.1

A. Look at the abacus and type the number. ANS

1. 

2. 

3. 

B. Click to mark the periods using commas and type the number in words. ANS

1. 437005
2. 95212
3. 300715
4. 81576
5. 10010
6. 389010

C. Type in figures. ANS

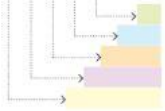
1. forty-seven thousand, nine hundred twenty-four _____
2. eight lakh, fifty-two thousand, one hundred seventy-four _____
3. three lakh, forty-five thousand, five hundred fifteen _____
4. five lakh, two hundred thirty-nine _____

D. Give the standard form for the following. ANS

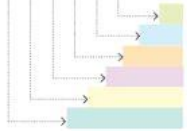
1. 8,000 + 600 + 70 + 5 _____
2. 9, 00, 000 + 70,000 + 6,000 + 500 + 10 + 4 _____
3. 6 ten thousands + 6 tens + 5 ones _____
4. 8 lakhs + 1 ten thousand + 3 thousands + 7 hundreds _____

E. Type the expanded form of the following. ANS

1. 5 8 0 1 4



2. 7 1 3 5 6 8



MORE PRACTICE ON PLACE VALUE

EXAMPLE 10 Write the place and the place value of the coloured digit.

a. 37,426 b. 9,51,618 c. 8,75,226

a. 37,426 b. 9,51,618 c. 8,75,226

PLACE: thousands lakhs ten thousands

PLACE VALUE: seven thousands or 7,000 | nine lakhs or 9,00,000 | seventy thousands or 70,000

EXAMPLE 11 Find the sum of the place values of 4 in 2,54,144.

2 5 4 1 4 4

→ 4
→ 4 0
→ 4 0 0 0

					4
				4	0
+	4	0	0	0	
	4	0	4	4	

ANS. The sum of the place values of 4 in 2,54,144 is 4,044.

EXAMPLE 12 Find the difference of the place values of 7 in 6,47,752.

6 4 7 7 5 2

→ 7 0 0
→ 7 0 0 0

	7	0	0	0
−		7	0	0
	6	3	0	0

ANS. The difference of the place values of 7 in 6,47,752 is 6,300.

EXAMPLE 13 A number has 4 lakhs, 5 tens, 9 ten thousands, 6 hundreds and 2 ones. What is the number?

Step 1 Write the places starting with the greatest.
Step 2 Write the digits below their places.

L	TTh	Th	H	T	O
4	9	0	6	5	2

Fill up the empty places with 0.

ANS. The number is 4,90,652.

EXAMPLE 14 Write the number 1 hundred more than 32,675.

ANS. 32,675 — Add 1 to the digit in the hundreds place → 32,775

Exercise 1.2

A. Fill in the table with the place and place value of each coloured digit. ANS

	Number	Place	Place value
1.	17,362		
2.	2,130		
3.	6,00,951		
4.	32,415		
5.	9,50,242		

B. Type the digit that has the greatest place value in the number. ANS

1. 26,473 2. 5,432 3. 9,12,345 4. 78,123

C. Type the digit that has the least place value in the number. ANS

1. 42,647 2. 6,15,430 3. 12,345 4. 8,123

D. Build the number that has ANS

1. 3 ten thousands, 1 thousand, 7 hundreds, 9 tens and 8 ones.
2. 2 lakhs, 5 thousands, 6 hundreds, 5 tens and 9 ones.

E. Find the sum of the place values of 6 in each of the following. ANS

1. 6,006 2. 1,92,660 3. 60,363 4. 69,696

F. Find the difference of the place values of 8 in each of the following. ANS

1. 8,181 2. 3,48,008 3. 98,892 4. 7,880

G. Observe the pattern to fill in the blanks. ANS

1. 20,116 20,136 20,156 _____ _____
2. 90,028 92,028 94,028 _____ _____
3. 3,74,308 4,74,308 5,74,308 _____ _____

H. Answer the following by studying the place value of the digits. ANS

1. How many thousands are there in 15678? _____
2. How many tens are there in 31284? _____
3. How many lakhs are there in 483569? _____

COMPARING NUMBERS

When the number of digits is different

The number with more digits is always greater.

EXAMPLE 15 Compare 3,948 and 81,039.

TTh	Th	H	T	O	
	3	9	4	8	→ 4-digit number
8	1	0	3	9	→ 5-digit number

ANS. 3,948 < 81,039

When the number of digits is the same

Compare the digits starting from the left. The number with the greater digit on the left is greater.

EXAMPLE 16 Compare 30,126 and 19,261.

3 0 1 2 6 1 9 2 6 1

3 is greater than 1

ANS. 30,126 > 19,261

What do you do when the digits in the extreme left place of both the numbers are the same?

Compare the second digit from the left and so on.

EXAMPLE 17 Compare 24,810 and 27,930.

2 4 8 1 0 2 7 9 3 0

4 is less than 7

ANS. 24,810 < 27,930

EXAMPLE 18 Compare 6,81,751 and 6,81,981.

6 8 1 7 5 1 6 8 1 9 8 1

7 is less than 9

ANS. 6,81,751 < 6,81,981

Writing numbers in order

Ascending order means the order of numbers from the smallest to the greatest.
Descending order means the order of numbers from the greatest to the smallest.

EXAMPLE 19 Write the following numbers in ascending order.
3,65,780 5,388 20,367 20,362

ANS. ASCENDING ORDER 5,388 20,362 20,367 3,65,780

EXAMPLE 20 Write the following numbers in descending order.
2,468 63,421 1,10,324 1,10,342

ANS. DESCENDING ORDER 1,10,342 1,10,324 63,421 2,468

Exercise 1.3

A. Compare each pair of numbers. Put > or < in the ◯. ANS

1. 18,108 ◯ 9,818
2. 10,018 ◯ 17,018
3. 74,369 ◯ 25,782
4. 7,346 ◯ 7,410
5. 53,821 ◯ 5,392
6. 9,346 ◯ 10,001
7. 42,478 ◯ 42,500
8. 87,419 ◯ 87,919
9. 5,63,510 ◯ 3,63,511

B. Type the numbers in ascending order. ANS

1. 6,767 97,676 5,454 4,545 _____
2. 13,421 3,142 3,214 33,244 _____
3. 75,510 5,501 5,515 5,500 _____
4. 2,16,179 6,197 6,109 61,901 _____
5. 8,61,791 7,393 9,198 6,000 _____

C. Type the numbers in descending order. ANS

1. 42,474 1,744 3,437 47,315 _____
2. 12,059 2,509 2,905 2,109 _____
3. 8,009 81,025 8,000 8,01,882 _____
4. 16,712 7,162 6,712 76,122 _____

FORMING NUMBERS

Greatest number

To build the greatest number, write the digits in decreasing order.

EXAMPLE 21 **Form the greatest number using the digits 4, 5, 0, 3 and 1.**

Write the digits in decreasing order. 5 4 3 1 0

ANS. The greatest number that can be formed using the digits is 54,310.

EXAMPLE 22 **Form the greatest 6-digit number using the digits 7, 1 and 3 by repeating the digits.**

ANS. The greatest 6-digit number that can be formed using the digits is 7,77,731.

Smallest number

To build the smallest number, write the digits in increasing order.

EXAMPLE 23 **Form the smallest number using the digits 3, 1, 0, 4 and 5.**

Write the digits in increasing order. 1 0 3 4 5

ANS. The smallest number that can be formed using the digits is 10,345.

EXAMPLE 24 **Form the smallest number using the digits 2, 1, 4, 8 and 3.**

Write the digits in increasing order.

1 2 3 4 8

ANS. The smallest number that can be formed using the digits is 12, 348.

EXAMPLE 25 **Form the smallest 5-digit number using the digits 2, 1, 4 and 3 by repeating the digits.**

ANS. The smallest 5-digit number that can be formed using the digits is 11, 234.

Exercise 1.4

A. Use the given groups of digits to type the greatest and the smallest numbers. ANS

	Digits	Greatest number	Smallest number
1.	4, 2, 7, 6, 3		
2.	2, 1, 3, 7, 8		
3.	8, 6, 2, 5, 9		
4.	5, 3, 9, 8, 0, 1		

B. Use the given digits to type the greatest and the smallest 5-digit numbers. You may repeat the digits. ANS

	Digits	Greatest number	Smallest number
1.	3, 7, 1, 4		
2.	2, 5, 0		
3.	1, 9, 6		
4.	3, 9		

Which is the smallest 5-digit number that ends in 9 and reads the same forwards as well as backwards? ANS

ROUNDING OFF NUMBERS

Sometimes you need only an estimate and not exact figures. For this, numbers can be rounded off.

Rounding to the nearest 10

EXAMPLE 26 **Round off 63 to the nearest 10.**

63 is between 60 and 70 but closer to 60. So, 63 is rounded off to 60.

ANS. 63 rounded off to the nearest 10 is 60.

EXAMPLE 27 **Round off 446 to the nearest 10.**

446 is between 440 and 450 but closer to 450.

So, 446 rounded off to the nearest 10 is 450.

ANS. 446 rounded off to the nearest 10 is 450.

EXAMPLE 28 **Round off 985 to the nearest 10.**

985 is between 980 and 990.

So, 985 rounded off to the nearest 10 is 990.

Quick TIP

If a number is exactly between two tens, it is rounded up to the higher ten.

ANS. 985 rounded off to the nearest 10 is 990.

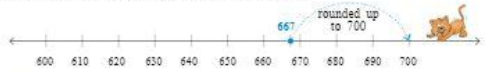
Rounding to the nearest 100

EXAMPLE 29 **Round off 667 to the nearest 100.**

667 is between 600 and 700 but closer to 700.

So, 667 rounded off to the nearest 100 is 700.

Look at the two hundreds between which the given number lies.

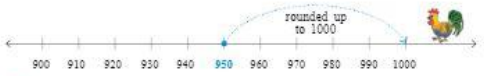


ANS. 667 rounded off to the nearest 100 is 700.

EXAMPLE 30 **Round off 950 to the nearest 100.**

950 is between 900 and 1000.

So, 950 rounded off to the nearest 100 is 1000.



ANS. 950 rounded off to the nearest 100 is 1000.

Rounding to the nearest 1000

EXAMPLE 31 **Round off 1429 to the nearest 1000.**

1429 is between 1000 and 2000 but closer to 1000.

So, 1429 rounded off to the nearest 1000 is 1000.

Look at the two thousands between which the given number lies.

ANS. 1429 rounded off to the nearest 1000 is 1000.

Exercise 1.5

A. Round off the following numbers to the nearest 10. ANS

1. 47	2. 98	3. 61	4. 385
5. 525	6. 829	7. 4289	8. 7343
9. 4185	10. 6292	11. 7598	12. 9143

B. Round off the following numbers to the nearest 100. ANS

1. 231	2. 468	3. 1845	4. 3056
5. 9550	6. 2090	7. 7380	8. 6777
9. 3296	10. 8432	11. 5645	12. 7343

C. Round off the following numbers to the nearest 1000. ANS

1. 3251	2. 1086	3. 4851	4. 20518
5. 19731	6. 23126	7. 9999	8. 89162
9. 41285	10. 62592	11. 73989	12. 91430

ROMAN NUMBERS

Long ago, the Romans used 7 letters of the Latin alphabet to represent numbers.

Roman numbers	I	V	X	L	C	D	M
Hindu–Arabic numbers	1	5	10	50	100	500	1000

Rules to write numbers in the Roman system

1. The letters I, X, C and M can be repeated, but not more than three times. The letters V, L and D are never repeated. The values of the repeated numbers get added.

I = 1 — X = 10

II = 1 + 1 = 2 — XX = 10 + 10 = 20

III = 1 + 1 + 1 = 3 — XXX = 10 + 10 + 10 = 30

CC = 100 + 100 = 200 — CCC = 100 + 100 + 100 = 300

2. A smaller number written to the right of a number of greater value means addition.

VIII = 5 + 1 + 1 + 1 = 8 — LV = 50 + 5 = 55

LX = 50 + 10 = 60 — LXXVI = 50 + 10 + 10 + 5 + 1 = 76

3. A smaller number written to the left of a number of greater value gets subtracted from the number placed after it.

IV = 5 − 1 = 4 — XL = 50 − 10 = 40

IX = 10 − 1 = 9 — XC = 100 − 10 = 90

Get It Right!

30 = XXX ✓

30 = XXL ✗

You can subtract only once from a Roman number.

4. When a smaller number is placed between two numbers of greater value, it is subtracted from the number placed after it.

LIX = 50 + (10 − 1) = 59 — XXIX = 10 + 10 + (10 − 1) = 29

For subtraction, in addition to Rules 3 and 4, there are a few more conditions:

- I can only be subtracted from V and X.
- X can only be subtracted from L and C.
- C can only be subtracted from D and M.
- V, L and D are never subtracted.

EXAMPLE 32 Convert to Roman numbers. a. 32 b. 46

a. 32 = 30 + 2 = XXX + II = XXXII

b. 46 = 40 + 6 = XL + VI = XLVI

EXAMPLE 33 Convert to Hindu–Arabic numbers. a. XXVII b. LXVI

a. XXVII = XX + VII = 20 + 7 = 27

b. LXVI = LX + VI = 60 + 6 = 66

Exercise 1.6

A. Convert to Roman numbers. ANS

1. 18 _____ 2. 25 _____ 3. 42 _____ 4. 48 _____
5. 53 _____ 6. 73 _____ 7. 84 _____ 8. 97 _____
9. 46 _____ 10. 29 _____ 11. 75 _____ 12. 91 _____

B. Convert to Hindu–Arabic numbers. ANS

1. XVII _____ 2. XXIV _____ 3. XXXVI _____ 4. XLIX _____
5. LV _____ 6. LXX _____ 7. LXXII _____ 8. XCVI _____
9. LVII _____ 10. LXXIII _____ 11. LXXXII _____ 12. XCV _____

C. Fill in the ◯ with >, < or =. ANS

1. VII ◯ VIII 2. XII ◯ XIII 3. LXXII ◯ LXXXII
4. XXX ◯ CC 5. XLIII ◯ XL 6. XL ◯ 40 + 10
7. CC ◯ 500 8. 4 × 7 ◯ XXVII 9. 40 − 20 ◯ XX

Maths Lab Activity

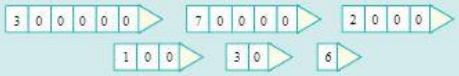
Aim: To form numbers beyond thousand

You will need: Arrow number cards

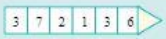
Preparation: Students work in groups of 3 to 4.

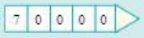
Steps

1. Each group has a set of arrow number cards.
2. The teacher will write a number on the blackboard, for example, 3,72,136 .
3. She / he will ask a student to read out the number.
   Three lakh seventy-two thousand one hundred thirty-six.
4. Each group will arrange the arrow cards to get the number called out.



5. The students hold the arrow cards properly to form the number.



6. One student asks the place value of a digit. For example:
   What is the place value of 7?
   Another student will remove the card with 7, that is 

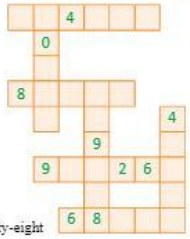
   and say 70000 .

   She / he will then ask the next student the place value of another digit, and the chain will continue.

Mental Maths

A. Type the numeral for each number written in words. Then, put the numbers in the puzzle correctly. ANS

- nine lakh thirty-four thousand two hundred sixty-eight
- forty-two thousand eight hundred sixty-three
- twenty thousand sixty-nine
- eighty-six thousand five hundred thirty-one
- sixty-eight thousand two hundred fifty-three
- six lakh twenty-four thousand one hundred eighty-five
- three lakh twenty-nine thousand four hundred fifty-eight



B. Use the given digits to build six-digit numbers based on the clues. ANS

9 3 6 5 1 4

1. Smallest six-digit number _____
2. Largest six-digit number _____
3. Smallest six-digit number beginning with an even digit _____
4. Greatest 6-digit even number _____
5. Largest 6-digit number with 9 at hundreds place _____
6. Smallest 6-digit number with 5 at units place _____

C. How many Roman numbers up to 20 can you make? Fill in the table. ANS

Number of matchsticks	Numbers in Roman system	Roman numbers you can make
2	II, V, X	3
3		
4		

Worksheet

A. Mark the periods and then type in words. ANS

1. 64283 2. 54391 3. 542760 4. 300050

B. Type these numbers in figures using commas. ANS

1. seventy thousand six hundred three
2. two lakh seven thousand nineteen

C. Type the numbers in ascending order. ANS

1. 4,38,501 1,50,834 34,805 1,43,508
2. 71,126 12,761 1,02,761 20,761

D. Type the numbers in descending order. ANS

1. 2,37,657 2,73,657 23,765 26,357
2. 1,00,525 10,525 1,00,255 1,02,505

E. Round off the numbers to the nearest 10, 100 and 1000. ANS

		10	100	1000
1.	9789			
2.	16926			

F. Type the answer as Roman Numbers. ANS

1. II + V = _____ 2. XXXIX – XVIII = _____
3. XXIII + XIV = _____ 4. LXV + XXIX = _____

G. Solve these story sums. ANS

1. Form the smallest 5-digit number using the digits 6, 1, 2 and 7 by repeating the digits.
2. Form the greatest 6-digit number using the digits 8, 2 and 3 by repeating the digits.
3. 1885 people are going to attend the Sports Day Function. How many chairs should be placed rounded to the nearest 100?