HICON SERIES

MATHEMATICS
NUMBERS

ONLINE CLASS

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LESSON
PART 5

1 NUMBERS

A. Write the number and number name. Then show it on the abacus.

Th   H   T   O   Th   H   T   O

Number   Number name

_____   _____

_____

B. Write the expanded form in figures.

1. 6321 = 6000 + _____ + _____ + _____

2. 4928 = _____ + _____ + _____ + _____

C. Answer the questions.

1. What is 1000 more than 8643 ? _____

2. Which is the largest 4-digit number ? _____

3. The smallest 4-digit number minus the largest 3-digit number = _____

4. What is 100 less than 4115 ? _____

5. The value of 3 in 2318 goes up by how many times when it moves to the left by 1 place ? _____

5 and 6 digit numbers

In the previous class, we have learnt numbers upto 9999 and we know that

1 more than 9 is 10 or 9 + 1 = 10

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1 more than 99 is 100 or 99 + 1 = 100

1 more than 999 is 1000 or 999 + 1 = 1000

and 1 more than 9999 is 10000 or 9999 + 1 = 10000

We read 10000 as ten thousand.

From the above pattern, we observe that when 1 is added to the largest 4-digit number, we get the smallest 5-digit number.

99999 is the largest 5-digit number.

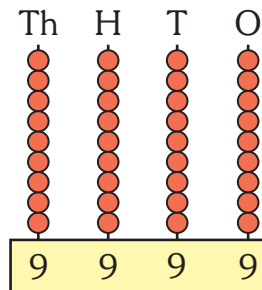Let us see what number comes just after 99999.

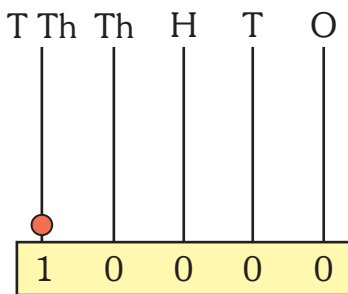Add 1 to 99999.

99999 + 1 = 100000

We read 100000 as one lakh.

> ### REMEMBER
> ✦ 10000 is the smallest 5-digit number and 99999 is the largest 5-digit number.
> ✦ 100000 is the smallest 6-digit number.

9999 is shown on the abacus as :

Th	H	T	O
9	9	9	9

10000 is shown on the abacus as :

T Th	Th	H	T	O
1	0	0	0	0

100000 is shown on the abacus as :
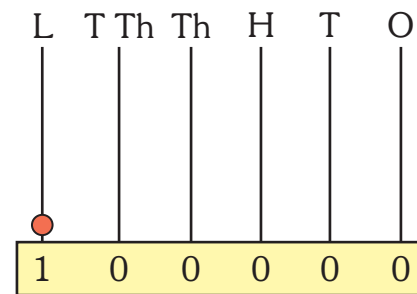
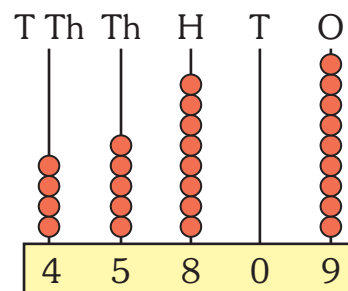| L	T Th	Th	H	T	O
1	0	0	0	0	0

The number 45809 consists of 4 ten thousands, 5 thousands, 8 hundreds, 0 tens and 9 ones. It is read as forty five thousand eight hundred nine. It is shown as :

T Th	Th	H	T	O
4	5	8	0	9

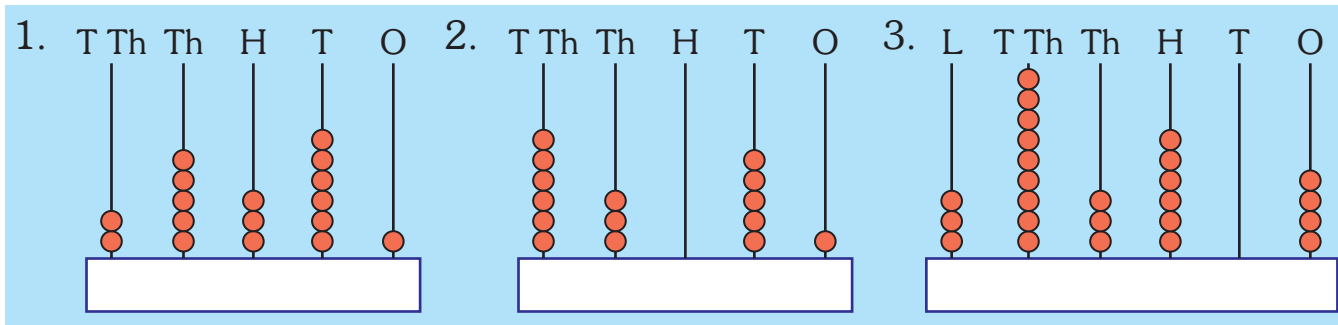| T Th	Th	H	T	O
4	5	8	0	9

I4MS

The number 869042 consists of 8 lakhs, 6 ten thousands, 9 thousands, 0 hundreds, 4 tens and 2 ones. It is read as eight lakh sixty nine thousand forty two.

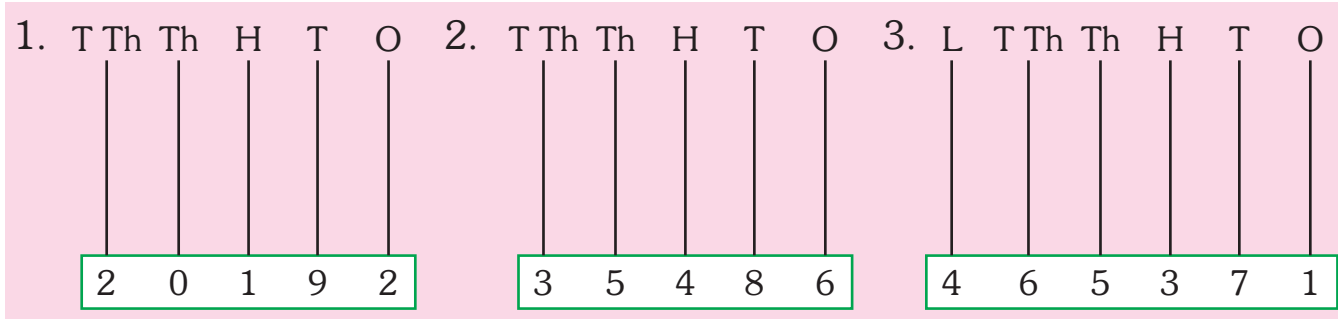| L	T Th	Th	H	T	O
8	6	9	0	4	2
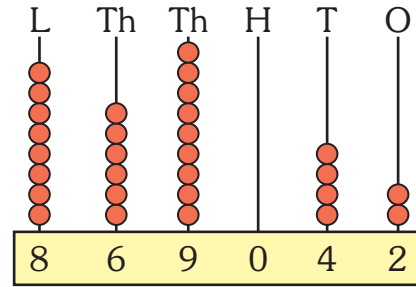
Exercise 1.1

A. Write the number for each abacus.

B. Show the number on the abacus.

T Th	Th	H	T	O
2	0	1	9	2

T Th	Th	H	T	O
3	5	4	8	6

L	T Th	Th	H	T	O
4	6	5	3	7	1

C. Write the numbers for the given number names.

1. Twenty six thousand four hundred seventy five _____
2. Fifty nine thousand three hundred seven _____
3. Fifteen thousand thirty one _____

D. Read the numbers and write the number names.

1. 61726 : _____
2. 52415 : _____
3. 338904 : _____

E. Write down the following.

1. Greatest 5-digit number : _____
2. Smallest 5-digit number : _____
3. 3 thousand more than 10010 : _____
4. 6 thousand less than 43102 : _____
5. Ten thousand more than 12345 : _____

PLACE VALUE CHART

The place value chart helps us to find the value of each digit of a numeral according to its position. The place value chart extends to the left with the extension of places to the left.

Indian Place Value Chart

LAKHS		THOUSANDS		ONES			Periods
TEN LAKHS (TL) 10,00,000	LAKHS (L) 1,00,000	TEN THOUSANDS (T Th) 10,000	THOUSANDS (Th) 1,000	HUNDREDS (H) (100)	TENS (T) 10	ONES (0) 1	Places

The place value chart has been separated into three groups called *periods*.

The ones period has three places – hundreds, tens and ones.

The thousands period has two places – ten thousands and thousands.

The lakhs period has two places – ten lakhs and lakhs.

When we write a number without using a chart, we use a comma to separate the periods.

Example 1: Write 4,36,492 according to Indian system of numeration.

Four lakh thirty six thousand four hundred ninety two

Example 2: Write 36,42,942 according to Indian system of numeration.

Thirty six lakh forty two thousand nine hundred forty two

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Write the amount in number shown in the cheque given below.

INTERNATIONAL PLACE VALUE CHART

The place value chart which is used by many countries of the world is known as International System of Numeration or the International Place Value Chart.

MILLIONS			THOUSANDS			ONES		
HUNDRED MILLIONS (HM) 100,000,000	TEN MILLIONS (TM) 10,000,000	MILLIONS (M) 1,000,000	HUNDRED THOUSANDS (H Th) (100,000)	TEN THOUSANDS (T Th) 10,000	THOUSANDS (Th) 1,000	HUNDREDS (H) (100)	TENS (T) 10	ONES (0) 1

The place value chart has been separated into three groups called *periods*.

The ones period has three places-hundreds, tens and ones.

The thousands period has three places- hundred thousands, ten thousands and thousands.

The millions period has three places– hundred millions, ten millions and millions.

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Example : Write 36,439,205 according to International System of Numeration.

Thirty six million four hundred thirty nine thousand two hundred five.

Periods

Indian Numeration System	Crores		Lakh		Thousands		Ones		
	TC	C	TL	L	T Th	Th	H	T	O

International Numeration System	Millions			Thousands			Ones		
	HM	TM	M	H Th	T Th	Th	H	T	O

From the Indian and International Place Value Chart, we observe that

100 thousands = 1 lakh   1 million = 10 lakhs

10 millions = 1 crore   100 millions = 10 crores

Exercise 1.2

A. Write the number name using Indian place value chart.

1. 15676
2. 38658
3. 23349
4. 247897
5. 904500
6. 112132

B. Write the number name using International place value chart.

1. 26656
2. 40494
3. 21392
4. 157787
5. 6381508
6. 7932013

C. Write the following in figures in your notebook.

1. Fifteen thousand eight hundred ninety nine
2. Sixty one thousand five
3. Five lakh thirty two thousand four hundred
4. Fifty thousand three hundred ninety two

D. Fill in the blanks by comparing the two place value charts (Indian and International).

1. 100 thousands = _____ lakh
2. 10 lakhs = _____ million
3. 40 millions = _____ crores
4. 700 thousands = _____ lakhs

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Place Value and Face Value

The value of the digit in any number is the *face value* of the digit.

Let us take the number 38914.

The face value of 3 is 3 in the number 38914.

The face value of 9 is 9 in the number 38914.

The place value of a digit depends upon the place it occupies in the number.

◆ If the digit is placed in the ones position, the place value will be the digit $\times$ 1.

◆ If the digit is placed in the tens position, the place value will be the digit $\times$ 10.

◆ If the digit is placed in the hundreds position, the place value will be the digit $\times$ 100

and so on. So we can say

> Place value of any digit = Face value of the digit $\times$ place

Example : Write the place values of various digits in 6,48,931.

There are 6 digits in 6,48,931. We need 6 places to write it. Look at the place value chart shown below.

Lakhs (100000)	Ten Thousands (10000)	Thousands (1000)	Hundreds (100)	Tens (10)	Ones (1)
6	4	8	9	3	1
6×100000 = 6,00,000	4×10000 = 40,000	8×1000 = 8,000	9×100 = 900	3×10 = 30	1×1 = 1

Exercise 1.3

A. Write the following numerals in the place value chart.

1. 25678
2. 14659
3. 340136
4. 79479
5. 5803514
6. 1282367

B. Write the face value, place and the place value of the underlined digits.

S. No.	Digit	Face Value	Place	Place Value
1	41568			
2	56247			
3	337969			
4	8100358			

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EXPANDED NOTATION

Expanded notation means to expand each digit of a number to its place value and then write their total sum.

Let us write the place values of all the digits of the number 78,429.

Number

7   8   4   2   9

Place Values of Digits

9 ones $= 9 \times 1$ $= 9$
2 tens $= 2 \times 10$ $= 20$
4 hundreds $= 4 \times 100$ $= 400$
8 thousands $= 8 \times 1000$ $= 8000$
7 ten thousands $= 7 \times 10000$ $= 70000$

The number 78,429 can be written in expanded form in three different ways.

a.   7 ten thousands + 8 thousands + 4 hundreds + 2 tens + 9 ones

b. $(7 \times 10000) + (8 \times 1000) + (4 \times 100) + (2 \times 10) + (9 \times 1)$

c.   70000 + 8000 + 400 + 20 + 9

Example : Write the following in standard form.

a.   6 ten thousands + 5 thousands + 4 hundreds + 2 tens + 1 one   Ans. 65,421

b.   50000 + 9000 + 100 + 40 + 7   Ans. 59,147

c. $(8 \times 1000000) + (7 \times 100000) + (5 \times 10000) + (1 \times 1000)$
     $+ (4 \times 100) + (3 \times 1)$ Ans. 87,51,403

Exercise 1.4

A. Write the standard numeral for the following.

1. 20,000 + 5,000 + 400 + 30 + 2   = _____

2. 10,000 + 7,000 + 500 + 40 + 1   = _____

3. 3,00,000 + 90,000 + 2,000 + 400 + 20 + 1   = _____

4. 7,00,000 + 80,000 + 9,000 + 800 + 40 + 5   = _____

5. 10,00,000 + 6,00,000 + 80,000 + 5000 + 40 + 9   = _____

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B. Write the expanded form of the following.

1. 29180   2. 37160   3. 465791   4. 5482789   5. 2334056

C. Write the place value of the underlined digit in each of the following.

1. 25878   2. 64291   3. 53324   4. 850135   5. 897967

6. 167968   7. 301506   8. 9443348   9. 1724234   10. 1612256

D. Write the sum of the place values of 3 in each of the following.

1. 38143   2. 3387   3. 2393   4. 35397   5. 33265

E. Find the difference of the place values of 6 in each of the following.

1. 7606   2. 6326   3. 6642   4. 26362   5. 4668

COMPARING NUMBERS

Comparing numbers with different number of digits

The number with more digits is always greater.

Therefore 1,45,498 > 75,430

Comparing numbers with same number of digits

1. First compare the lakhs digits.

> 5,39,468 > 4,28,972
> as 5 > 4

2. If the lakhs digits are the same, compare the ten thousands digits.

> 7,67,329 < 7,89,900
> as 6 < 8

3. If the lakhs and ten thousands digits are the same, compare the thousands digits.

> 8,49,603 > 8,47,782
> as 9 > 7

4. Continue in this way—going to the right digit by digit until you find two digits that are different. See the examples below.

> 7,53,639 > 7,53,036
> as 6 > 0

> 6,28,349 < 6,28,383
> as 4 < 8

> 5,34,348 > 5,34,343
> as 8 > 3

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ORDERING OF NUMBERS

Arranging numbers in *ascending order* means arranging them in increasing order— that is from the smallest to the greatest.

Example : Arrange 27883, 2496, 30000, 8592 in ascending order.

Ascending order   : 2496 < 8592 < 27883 < 30000

(Smallest First)

Arranging numbers in *descending order* means arranging them in decreasing order— that is from the greatest to the smallest.

Example : Arrange 25558, 9263, 154342, 83426 in descending order.

Descending order (Greatest First) : 1,54,342 > 83,426 > 25,558 > 9263

Exercise 1.5

A. Fill in the correct symbol < or >.

1. 84,026 ◯ 32,001

2. 64,332 ◯ 86,331

3. 1,95,422 ◯ 95,099

4. 3,56,780 ◯ 3,56,790

5. 2,48,291 ◯ 2,48,270

6. 5,87,009 ◯ 5,77,897

B. Ring the greatest number in each.

1. 20,182   9876   1,20,001

2. 23,596   33,496   22,996

3. 53,138   53,238   53,088

4. 4,67,143   4,68,122   4,68,222

C. Ring the smallest number in each.

1. 67,789   67,879   67,979

2. 4355   44,355   4495

3. 5,60,000   5,61,000   99,999

4. 1,16,433   12,346   21,643

D. Arrange the following in ascending order.

1. 47,520   9760   52,497   1,00,000

2. 53,217   53,211   55,600   45,301

3. 1,21,050   1,12,500   5,10,211   1,02,570

E. Arrange the following in descending order.

1. 50,329   59,329   59,530   5,59,530

2. 26,566   26,660   27,560   3,27,400

3. 3,41,956   9,56,432   3,14,566   9,65,432

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FORMING SMALLEST AND GREATEST NUMBERS USING GIVEN DIGIT

1. For forming the greatest number using given digits, arrange the digits in descending order. If two digits are equal, write them at consecutive places.

   Example : Write the greatest 5-digit number using the digits 7, 5, 0, 3 and 8.

   The descending order of the given digits is 8, 7, 5, 3, 0.

   Thus, the greatest number of five digits with the given digits is 87530.

2. For forming the smallest number, arrange the given digits in ascending order. Select the smallest digit (other than 0) and write it in extreme left place. If 0 is one of the digits, write 0 in the second place from the left. Now, write remaining digits in ascending order. If two digits are same, write them in consecutive places.

   Example : Write the smallest 5-digit number using the digits 3, 8, 0, 6 and 4.

   The ascending order of the given digits is 0, 3, 4, 6 and 8.

   The smallest digit (other than 0) is 3.

   Thus, the smallest 5-digit number with the given digits is 30468.

SUCCESSOR AND PREDECESSOR

The number that comes just after a given number is called its *successor*. To find the successor of a given number, we add 1 to the given number.

Example : Find the successor of each of the following numbers.

　　　　　(a) 899　　　　(b) 7386　　　　(c) 48243　　　　(d) 664293

Solution : (a) Successor of 899　　　=　899 + 1 = 900

　　　　　　(b) Successor of 7386　　=　7386 + 1 = 7387

　　　　　　(c) Successor of 48243　=　48243 + 1 = 48244

　　　　　　(d) Successor of 664293　=　664293 + 1 = 664294

The number that comes just before a given number is called its *predecessor*. To find the predecessor of a given number, we subtract 1 from the given number.

Example : Find the predecessor of each of the following numbers.

　　　　　a. 750　　　b.　8395　　　c.　78000　　　d. 800000

Solution : (a) Predecessor of 750　　=　750 – 1 = 749

　　　　　　(b) Predecessor of 8395　=　8395 – 1 = 8394

　　　　　　(c) Predecessor of 78000　=　78000 – 1 = 77999

　　　　　　(d) Predecessor of 800000 =　800000 – 1 = 799999

Exercise 1.6

A. Build the greatest and the smallest numbers with these digits, without repeating the digits.

Digits	Number of digits	Greatest number	Smallest number
(1) 4, 3, 1, 7	4		
(2) 5, 3, 2, 1, 4,	5		
(3) 3, 0, 6, 1, 8, 7	6		
(4) 0, 2, 7, 5, 6, 9	6		

B. Build the greatest and the smallest numbers with these digits, by repeating the digits as required.

Digits	Greatest 5-digit number	Smallest 5-digit number	Greatest 6-digit number	Smallest 6-digit number
(1) 3, 1, 7				
(2) 2, 8, 4				
(3) 7, 0, 6, 3				
(4) 0, 2, 7, 5				

C. Write down the successor of the following numbers.

1. 21,015   2. 89,413   3. 21,385   4. 1,32,169
5. 3,06,401   6. 7,98,228   7. 92,09,072   8. 46,70,389

D. Write down the predecessor of the following numbers.

1. 12,713   2. 68,749   3. 4,76,954   4. 6,68,945
5. 43,89,266   6. 54,04,734   7. 38,57,502   8. 57,56,158

ROUNDING NUMBERS

Rounding to the nearest 10
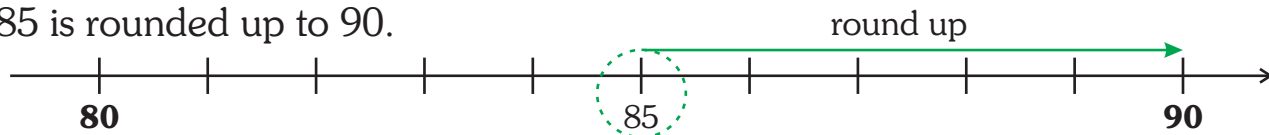
To round off a number, say 57, to the nearest 10 :

Divya asked her friend Kareena, 'How many rajma beans are there in the bowl ?'

Kareena replied 1178. Divya said the rajma beans are about 1200. We use rounding when we talk about how many. This means not exactly 1178 or not exactly 1200 but a number which is very close to the actual number.

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- Rounding makes numbers easier to work within your mind.
- Rounded numbers are only approximate numbers.
- An exact answer generally can not be obtained using rounded numbers.

1. Find the tens between which the number lies; 57 lies between 50 and 60.
2. Find which ten the number is closer to; 57 is closer to 60 than 50, so it is *rounded up* to 60.

round up

| 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
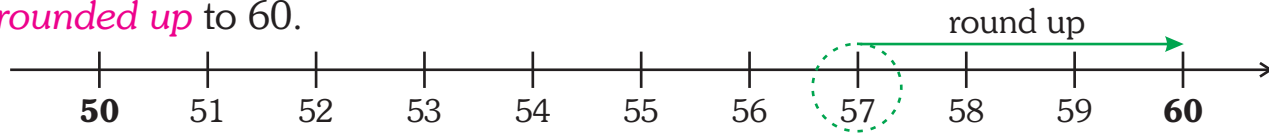
3. If the number is midway between the two tens it is rounded up — for example 85 is rounded up to 90.

round up

| 80 | | | | | 85 | | | | 90 |

Example : Round off (a) 523 and (b) 1483 to the nearest 10.

(a) 523 lies between 520 and 530. It is closer to 520. Therefore it is rounded down to 520.

round down   523

| 520 | | | | | | | | | | 530 |
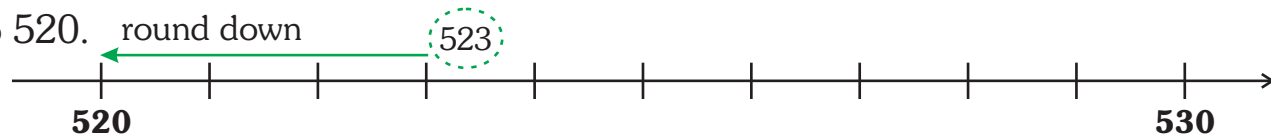
(b) 1483 lies nearer to 1480 than 1490. Therefore it is rounded as 1480.

Rounding to the nearest 100

To round off a number, say 842, to the nearest 100 :

1. Find the hundreds between which the number lies; 842 lies between 800 and 900.
2. Find which hundred the number is closer to; 842 is closer to 800 than 900, so it is rounded down to 800.

round down   842

| 800 | 810 | 820 | 830 | 840 | 850 | 860 | 870 | 880 | 890 | 900 |
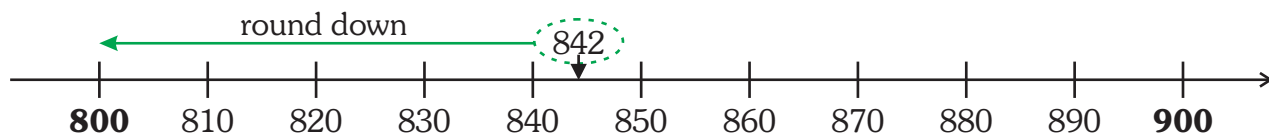
3. If the number is midway between the two hundreds, it is rounded up to next hundred. For example 350 is rounded up to 400.

round up

| 300 | | | | | 350 | | | | 400 |
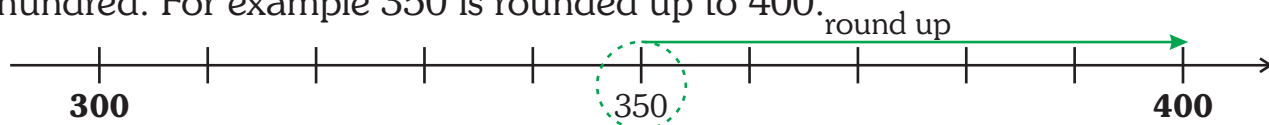
Example : Round off (a) 381 and (b) 3650 to the nearest 100.

(a) 381 lies between 300 and 400.

It is closer to 400. Therefore it is rounded up to 400.

(b) 3650 lies midway between 3600 and 3700. Therefore it is rounded up to 3700.

Rounded to the nearest 1000

To round off a number, say 3640, to the nearest 1000 :

1. Find the thousands between which the number lies; 3640 lies between 3000 and 4000.
2. Find which thousand the number is closer to; 3640 is closer to 4000 than 3000, so it is rounded up to 4000.
3. If the number is midway between the two thousands, it is rounded up to the higher thousand. For example, 7500 is rounded up to 8000.

Example : **Round off** (a) 5380 and (b) 23,500 to the nearest 1000.

(a) 5380 lies between 5000 and 6000.

It is closer to 5000. Therefore it is *rounded* as 5000.

(b) 23500 lies midway between 23000 and 24000. Therefore it is *rounded* as 24000.

Exercise 1.7

A. Round off to the nearest 10.

1. 42	2. 78	3. 562	4. 95
5. 124	6. 867	7. 1456	8. 21,355

B. Round off to the nearest 100.

1. 754	2. 8638	3. 9772	4. 249
5. 150	6. 45,813	7. 27,390	8. 99

C. Round off to the nearest 1000.

1. 3792	2. 57,201	3. 6990	4. 84,227
5. 4399	6. 2,69,859	7. 5,77,645	8. 999

D. Solve the following word problems.

1. You want to distribute sweets for your class on your birthday. There are 36 children in your class. How many sweets will you take, rounded to the nearest 10 ?
2. Mehak's class has 52 children. She rounds off to the nearest 10 and takes 50 ball pens to class on her birthday. Did she do the right thing ? Why ? What should she have done ?
3. A newspaper reporter was told that 23,347 people watched a cricket match between India and Sri Lanka. In the newspaper, he gave the headlines as : *23,000 watched the cricket match*. How did he round off the number ?

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ROMAN NUMERALS

The ancient Romans wrote numerals which did not use place value. They had seven basic symbols represented by the following letters.

Roman numerals	I	V	X	L	C	D	M
Hindu-Arabic system	1	5	10	50	100	500	1000

They formed the numbers from 1 to 39 using just three letters- I, V and X. The numbers were obtained by combining I, V and X following certain rules.

Rule 1 : Numerals I and X can be repeated.

Repetition means addition. I and X can be repeated upto three times.

III = 1 + 1 + 1 = 3
XX = 10 + 10 = 20

Rule 2 : A numeral written *after* a numeral of bigger value, means *addition*.

VI = 5 + 1 = 6
XXV = 10 + 10 + 5 = 25

Rule 3 : A numeral written *before* a numeral of bigger value, means *subtraction*.

IV = 5 – 1 = 4
IX = 10 – 1 = 9

Rule 4 : If a number is placed *between* two numbers of greater value, it is *subtracted from the number on the right*.

XIV = 10 + (5 – 1) = 14
XIX = 10 + (10 – 1) = 19

Exercise 1.8

A. Write the Roman numerals.

1. 9 _____
2. 15 _____
3. 18 _____
4. 21 _____
5. 27 _____
6. 28 _____
7. 30 _____
8. 32 _____
9. 36 _____
10. 33 _____
11. 38 _____
12. 37 _____

B. Write the Hindu-Arabic numerals.

1. VII _____
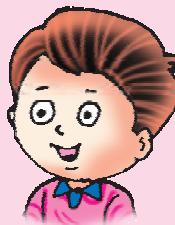2. XVIII _____
3. XX _____
4. XV _____
5. XVII _____
6. XXXI _____
7. XXXIV _____
8. XXXV _____

C. Use the Roman system rules to complete the table.

1	I		21	XXI	10 + 10 + 1
2	II	1 + 1	22		
3	III		23		
4	IV	5 – 1	24		10 + 10 + (5 – 1)
5	V		25	XXV	
6		5 + 1	26		
7			27		
8			28		
9	IX		29	XXIX	
10	X		30	XXX	
11	XI		31		
12		10 + 2	32		
13			33		10 + 10 + 10 + 3
14	XIV		34		
15		10 + 5	35	XXXV	
16	XVI		36		
17			37		
18			38		
19	XIX		39		10 + 10 + 10 + (10 – 1)
20		10 + 10	40		

HOTS

Golu and Molu wrote the following Roman numerals for the given Hindu-Arabic numerals. Put ✓ for right and ✗ for wrong answer. Also point out the mistake.

	GOLU	MOLU
22	XXVVII	XXII
4	IV	IIII
14	XIV	XIIII
9	VIIII	IX

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WORKSHEET

A. Write the numbers for the given number names.

1. Five lakh fifteen thousand ten

2. Ten thousand one hundred eleven

3. Nine lakh ninety two thousand nine hundred nine

B. Read the numbers and write the number names.

1. 1,29,323 : _____

2. 44,044 : _____

3. 9,99,009 : _____

C. Write the following in expanded form.
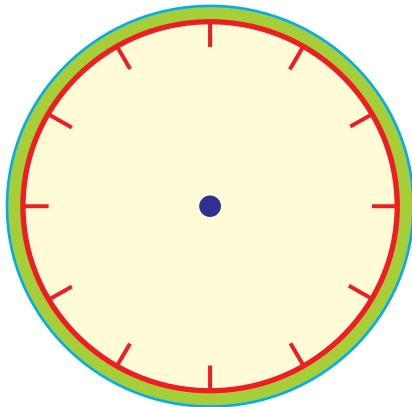
1. 71,808 : _____

2. 6,54,308 : _____

D. Write the following in the standard form.

1. $6,00,000 + 50,000 + 9000 + 100 + 30 + 4 =$ _____

2. $1,00,000 + 20,000 + 6000 + 700 + 7 =$ _____

E. Write the place value of the digit underlined in each of the following.

1. 3̲8,947   2. 4,24,5̲90   3. 2̲6,353

4. 1,4̲4,643   5. 59,68̲2

F. Write the Roman numerals 1 to 12 on the clock.

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I4MS

MATHS LAB

Objective : To compare numbers having same number of digits

**Materials Required :** Squared paper, sketch pens, pair of scissors, fevicol

Steps :

1. Divide the class into pairs.
2. Each group is given a couple of 5-digit numbers.
3. Tell the students to represent the 5-digit number with the help of squared paper.
4. Think each cell in the squared paper represents 1.
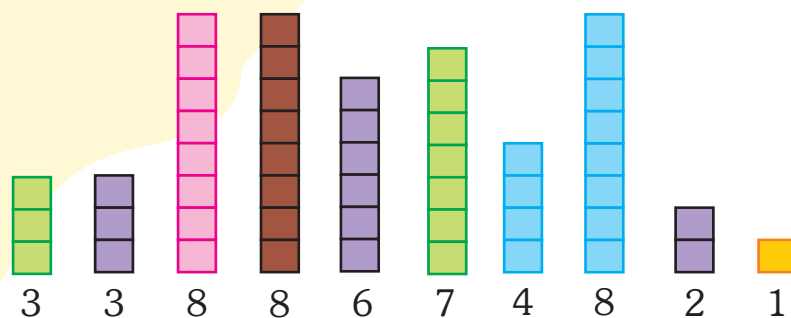5. Each column will comprise of the number of cells of the given digit.

Example

Compare the two numbers 38642 and 38781.

1. Each student will represent the number with the help of squares and colours as shown.

Student A

3   8   6   4   2
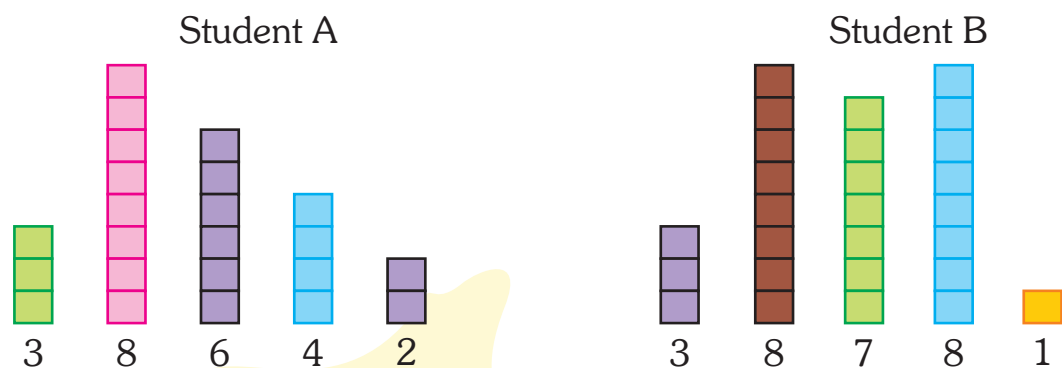
Student B

3   8   7   8   1

2. Students will cut each block and compare the length of each column according to the place value of the numbers.

3   3   8   8   6   7   4   8   2   1

3. Here, 6 < 7, so the number corresponding to the bigger length will be greater.
4. The number 38781 is greater.