Chapter

1 Numbers up to 100,000

New topic alert!
How do you feel?

Excited Nervous

Look!

Pascal is watching a football match with his father and mother. Pascal's father is holding the tickets. What numbers are written on the tickets that Pascal's Father is holding? Which number is the greatest?

Learning Objectives

- Identify the place value numbers up to 100,000
- Compare numbers up to 100,000
- Round numbers to nearest 10, 100, and 1,000
- Identify Roman numerals

Maths Lingo

- Face value
- Place value
- Roman numerals
- Successor
- Predecessor

Warm Up

Remembered Perception

In Year 4, we learnt about numbers and number names up to 10,000. Let's recall that lesson.

Scan Me!

1. Write the number names of the following numbers.

a. 5,273 _____

b. 7,029 _____

2. Write the corresponding numbers for the following number names.

a. Four thousand six hundred twenty _____

b. Eight thousand one hundred seven _____

3. Write the place values of the following digits.

a. 4 in 2,419 _____ b. 6 in 6,013 _____

4. Write the following numbers in expanded form.

a. 4,527 _____

b. 8,016 _____

5. Write the short form of the following expended numbers.

a. 4,000 + 200 + 60 + 9 = _____

b. 8,000 + 300 + 4 = _____

6. Arrange the following numbers in descending order.

a. 4,582; 4,528; 4,825; 858 _____

b. 7,310; 7,013; 3,710; 7,301 _____

99,999 is read as ninety-nine thousand, nine hundred and ninety-nine.
99,999 is the greatest 5-digit number.
If we add 1 to 99,999, we get:
99,999 + 1 = 100,000, the smallest 6-digit number.
We can keep adding 1 to get the next higher number. This process goes on forever. There is no greatest number.

Spotlight!

Place Value Chart

Observe the following place value chart, which shows the digits in the numbers 63,158; 39,846; and 100,000.

Period	Thousands			Ones		
Place Value	Hundred-Thousands (H-Th)	Ten-Thousands (T-Th)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
63,158		6	3	1	5	8
39,846		3	9	8	4	6
100,000	1	0	0	0	0	0

Remember

When writing large number, we use commas to separate the periods (group of digits). This helps us read the number easily.

Example 1 : Write the number name for each of the following numbers.

a. 38,946 b. 90,534

Solution :

	Thousands		Ones		
	T-Th	Th	H	T	O
a.	3	8	9	4	6
b.	9	0	5	3	4

a. → Thirty-eight thousand, nine hundred and forty six.
b. → Ninety thousand, five hundred and thirty-four.

Writing Large Numbers in Figures

Spotlight!

Example 2 : Write the number 'twelve thousand, one hundred and twenty-four' in figures.

Solution : We proceed as follows.

Step 1. Make two periods as shown.

Th		O		

The ones period (on the right) has three parts. The thousands period (on the left) has two parts.

Step 2. Write the thousands in the first period. Since the number is twelve thousand, we write 12 in the thousands period.

Th		O		
1	2			

Step 3. Write the hundreds, tens, and ones in the second period. So, we write one hundred and twenty-four in the ones period.

Th		O		
1	2	1	2	4

Therefore, twelve thousand, one hundred and twenty-four in figures is 12,124.

Face Value of a Digit

Spotlight!

Consider the number 95,613. It has 5 digits: 9, 5, 6, 1, and 3.
We say that in 95,613, the face value of 9 is 9, 5 is 5, 6 is 6, 1 is 1, and 3 is 3.

The face value of a digit in a number is simply the digit itself, no matter where it is placed in the number.

Spotlight!

Place Value of a Digit in a Number

The place value of a digit in a number depends on its face value and the place it occupies in the place value chart.

Place value of a digit = Face value × Value of the place it occupies in the place value chart.

Place Value Chart

Ten-Thousands (T-Th)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
10,000	1,000	100	10	1

Consider the number 18,359.

Let's arrange its digits in the place value chart.

T-Th 10,000	Th 1,000	H 100	T 10	O 1
1	8	3	5	9

Remember

The place value of 0 is always 0, whatever place it occupies in the place value chart.

From the place value chart above, we see that:

9 is in ones place, so its place value is 9 ones = 9 × 1 = 9.

5 is in tens place, so its place value is 5 tens = 5 × 10 = 50.

3 is in hundreds place, so its place value is 3 hundreds = 3 × 100 = 300.

8 is in thousands place, so its place value is 8 thousands = 8 × 1,000 = 8,000.

1 is in ten thousands place, so its place value is 1 ten thousand = 1 × 10,000 = 10,000.

Spotlight!

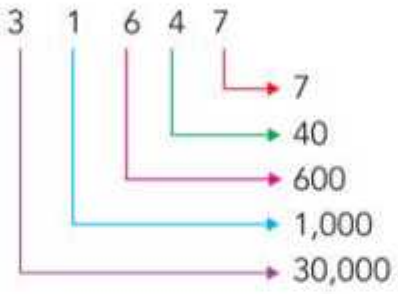
Expanded Form

In expanded form, a number is written as the sum of the place values of its digits.

Example 3 : Write 31,647 in expanded form.

Solution : Arrange the digits in the place value chart.

T-Th	Th	H	T	O
3	1	6	4	7



Thus, 31,647 = 30,000 + 1,000 + 600 + 40 + 7

Exercise 1A

1. Write the number names for each of the following numbers.

a. 29,502 _____

b. 65,009 _____

2. Write each of the following numbers in figures.

a. Fifteen thousand, five hundred and twelve _____

b. Fifty thousand, two hundred and two _____

3. Write the face value of each of the following digits.

a. 1 in 25,103 _____ b. 4 in 59,436 _____

4. **Find the place value of 6 in each of the following numbers.**

a. 2,568 _____ b. 65,140 _____

5. **Write the following numbers in expanded form.**

a. 6,594 _____

b. 69,008 _____

6. **Write the short form of the following expanded numbers.**

a. 5,000 + 300 + 40 + 3 _____

b. 30,000 + 5,000 + 200 + 20 + 7 _____

Spotlight!

Comparison of Numbers

Case 1: When two numbers have a different number of digits

A number with more digits is always greater than a number with fewer digits.

Example 4 : Which number is greater, 2,537 or 51,693?

Solution : 2,537 has 4 digits and 51,693 has 5 digits.

So, 51,693 is greater than 2,537. We write this as 51,693 > 2,537.

Case 2: When two numbers have the same number of digits

In this case, we proceed as follows.

Step 1. Compare the left-most digits (the highest place). The number with the greater digit is the greater number.

Step 2. If the left-most digits are equal, move to the next digit on the right. Again, compare them.

Step 3. Keep comparing each digit from left to right until you find digits that are not equal. The number with the larger digit at that place is greater.

Example 5 : Compare 34,510 and 34,578.

Solution : Both numbers have 5 digits, so we compare digit by digit from the left.

3 = 3 (left-most digits)

4 = 4 (second digits from the left)

5 = 5 (third digits from the left)

1 < 7 (fourth digits from the left)

Thus, 34,510 < 34,578 or 34,578 > 34,510.

Spotlight!

Successor of a Number

The successor of a number is the number that comes just after it.

To find the successor, we simply add 1 to the given number.

Example 6 : Find the successor of:

a. 599 b. 3,500 c. 31,499

Solution : a. Successor of 599 = 599 + 1 = 600.

b. Successor of 3,500 = 3,500 + 1 = 3,501.

c. Successor of 31,499 = 31,499 + 1 = 31,500.

Spotlight!

Predecessor of a Number

The predecessor of a number is the number that comes just before it.

To find the predecessor, we simply subtract 1 from the given number.

Example 7 : Find the predecessor of:

a. 270 b. 6,900 c. 54,196

Solution : a. Predecessor of 270 = 270 – 1 = 269.

b. Predecessor of 6,900 = 6,900 – 1 = 6,899.

c. Predecessor of 54,196 = 54,196 – 1 = 54,195.

Spotlight!

Building Numbers

Consider the digits 4, 6, and 0. Using each digit only once, let's form the greatest and the smallest 3-digit numbers.

To get the greatest 3-digit number, arrange the given digits in descending order.

Thus, 640 is the greatest 3-digit number.

To get the smallest 3-digit number, arrange the given digits in ascending order.

You might think 046 is the answer, but that is not correct. We cannot start a 3-digit number with 0 because 046 is actually just 46. Thus, 406 is the smallest 3-digit number.

Remember

If one of the given digits is 0, we should not place it at the beginning of the number. To make the smallest number, put 0 in the second place from the left.

Example 8 : Form the smallest and the greatest 5-digit numbers using the digits 4, 6, 3, 1, and 0 only once.

Solution : The smallest number is 10,346.
The greatest number is 64,310.

Exercise 1B

1. Fill in the blanks using '>', '=', or '<'.

a. 2,506 ☐ 286

b. 4,651 ☐ 79,512

2. Write the greatest number in each group.

a. 5,320; 3,520; 2,530; 2,053 _____

b. 19,754; 45,791; 95,714; 71,459 _____

3. Write the smallest number in each group.

a. 62,514; 21,951; 41,527; 42,519 _____

b. 73,172; 47,312; 40,312; 74,312 _____

4. Arrange the following numbers in ascending order.

61,935; 2,091; 517; 1,025; 3,610

_____

5. Arrange the following numbers in descending order.

9,165; 6,501; 62,519; 653; 25,009

_____

6. Write the successor of each of the following numbers.

a. 65,830 _____ b. 12,599 _____

7. Write the predecessor of each of the following numbers.

a. 12,890 _____ b. 36,000 _____

8. Write the greatest and the smallest 4-digit numbers (without repeating any digit) using the following digits.

a. 4, 7, 2, 3 _____ b. 5, 0, 2, 1 _____

Spotlight!

Rounding Numbers

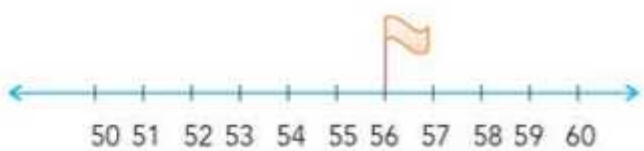
When we round a number, we give an approximately value instead of the exact one. This help us with simpler numbers.

Rounding to the nearest 10

To round a number to the nearest 10, find the two tens the number lies between.

Round 56 to the nearest 10.

56 lies between 50 and 60.



Since 56 is closer to 60 than 50, it is rounded up to 60.

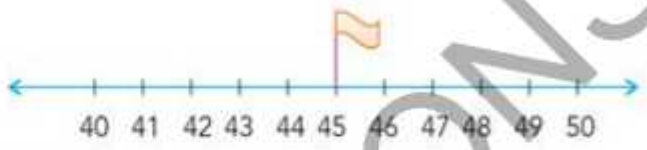
Round 72 to the nearest 10.

72 lies between 70 and 80.

Since 72 is closer to 70 than 80, it is rounded down to 70.

Round 45 to the nearest 10.

45 lies between 40 and 50.



Since 45 is exactly half way between 40 and 50, it is rounded up to 50.

Rounding to the nearest 100

To round a number to the nearest 100, find the two hundreds the number lies between.

Remember

When a number is exactly half way, we round up.

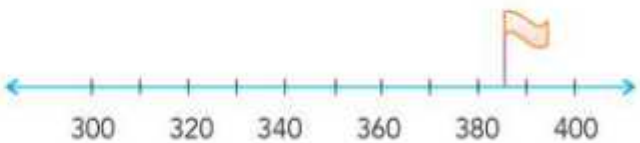
Round 536 to the nearest 100.

536 lies between 500 and 600.

Since 536 is closer to 500 than 600, it is rounded down to 500.

Round 385 to the nearest 100.

385 lies between 300 and 400.



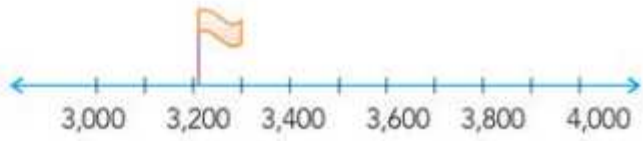
Since 385 is closer to 400 than 300, it is rounded up to 400.

Rounding to the nearest 1,000

To round a number to the nearest 1,000; find the two thousands the number lies between.

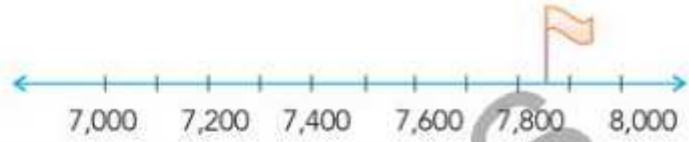
Round 3,210 to the nearest 1,000.

3,210 lies between 3,000 and 4,000.



3,210 is closer to 3,000 than 4,000. So, 3,210 is rounded down to 3,000.

Round 7,845 to the nearest 1,000.
7,845 lies between 7,000 and 8,000.



7,845 is closer to 8,000 than 7,000. So, 7,845 is rounded up to 8,000.

Exercise 1C

1. Round the following numbers to the nearest 10.
   a. 57 _____ b. 105 _____ c. 4,721 _____
2. Round the following numbers to the nearest 100.
   a. 267 _____ b. 2,136 _____ c. 4,032 _____
3. Round the following numbers to the nearest 1,000.
   a. 5,783 _____ b. 8,106 _____ c. 42,103 _____

Scan Me!

Spotlight!

Roman Numerals

In the Hindu-Arabic numeration system, we use ten symbols (digits) to write number. These symbols are 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.

Unlike the Hindu-Arabic numeration system, the Roman numeration system uses only seven symbols to write number.

These symbols are I, V, X, L, C, D, and M.
The values of these symbols are given below.

Roman Numerals	I	V	X	L	C	D	M
Hindu-Arabic Numerals	1	5	10	50	100	500	1,000

There is no zero in the Roman numeration system. One important difference between the Hindu-Arabic numeration system and the Roman numeration system is that the Roman numeration system does not use the concept of place value.

The following rules are used to write Roman numerals.

Rule 1: Repetition means addition. When a roman numeral is repeated, its values are added.

For example, III= 1 + 1 + 1 = 3

XX = 10 + 10 = 20

Rule 2: Smaller numeral after bigger numeral = add. When a smaller numeral comes after a bigger one, you add their values.

For example, VII= 5 + 1 + 1 = 7

XV= 10 + 5 = 15

XXI= 10 + 10 + 1 = 21

Remember

In Roman numeration system:

a. A can be repeated only up to three times.

b. The symbols V, L, and D cannot be repeated.

c. The symbols V, L, and D are never subtracted.

Rule 3: Smaller numeral before a bigger numeral = subtract. When a smaller numeral comes before a bigger one, you subtract the smaller from the bigger.

For example, IV = 5 – 1 = 4

Example 9 : Write the Hindu-Arabic numerals for the following.

a. XXVI b. XXXIX

Solution : a. XXVI = 10 + 10 + 5 + 1 = 26

b. XXXIX = 10 + 10 + 10 + 10 – 1 = 39

Exercise 1D

1. Write the Hindu-Arabic numerals for each of the following.

a. IV _____ b. IX _____ c. XVI _____ d. XXIV _____

2. Write each of the following in Roman numerals.

a. 21 _____ b. 35 _____ c. 19 _____ d. 38 _____

3. Fill in the boxes using '<', '=', or '>'.

a. XI ☐ 9 b. XVIII ☐ 18 c. XXIV ☐ 26

Practice Makes Perfect

1. Write the number names for each of the following.

   a. 43,575 _____

   b. 90,304 _____

2. Write each of the following numbers in figures.

   a. Twelve thousand, five hundred and twenty-four. _____

   b. Twenty thousand, and eight. _____

3. Find the place value of:

   a. 5 in 35,019 _____

   b. 6 in 54,186 _____

Pick the Right Answer

Intellectual Development

Tick (✓) the correct answer.

1. Sixty-three thousand, and ten can be written as _____.

   ◯ 63,100 ◯ 63,001

   ◯ 63,010 ◯ 60,301

2. Rounding 62,718 to the nearest 1,000 gives _____.

   ◯ 60,000 ◯ 62,000

   ◯ 63,700 ◯ 63,000

3. The symbol in the Roman numeral system which is never repeated is ____.

   ◯ I ◯ X

   ◯ V ◯ C

Thinking About Values

Responsible Decision Making

The Department of Social Welfare did a survey to find out how many literate males and females live in a town. The results are given below.

Total number of males = 37,442

Number of literate males = 29,005

Total number of females = 32,309

Number of literate females = 21,896

a. Write the number name for each of the numbers above.

37,442 _____

29,005 _____

32,309 _____

21,896 _____

b. Arrange the four numbers above in ascending order. _____

_____

c. What steps can we take to help more people in our society become literate?

_____

HOTS Questions

Intellectual Development

1. I am a 4-digit number. My hundreds digit is 3 less than my ones digit. My ones digit is 5. My tens digit is 1 more than my hundreds digit. My thousands digit is the same as my hundreds digit. Who am I? _____

2. Form the smallest and the greatest 4-digit numbers using all the digits 5, 9, 0, and 2 (without repeating any digit). Also, find the difference between the two numbers.

_____

Fun Time

Critical Thinking

1. Move only one stick to correct the sentence.
2. What must you do to make the adjoining statement true?

Brainy Maths

Intellectual Development

Fill in the blanks.

1. Write the place value of 2 in 52,693. _____
2. Write the predecessor of the smallest 5-digit number. _____
3. Write the greatest 5-digit number using three different digits only. _____
4. How many 3-digit numbers are there in total? _____
5. XX = 10 + 10 = 20. In the same way, can we write VV = 5 + 5 = 10? _____

Skill Builders

Critical Thinking

Cross (✗) the correct answer.

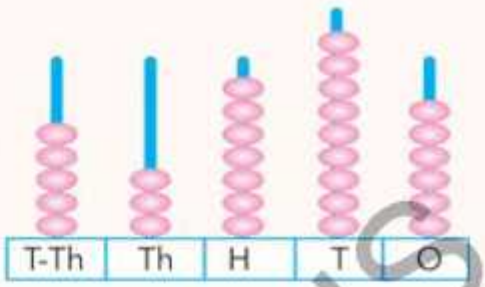
1. Edison's clues about his mystery number are shown in the bubble on the right.

   What is Edison's mystery number?

   a. 58,260
   c. 62,850
   b. 68,052
   d. 86,520

My number has:
- 5 tens
- 8 thousands
- 2 ones
- 6 ten thousands
- 0 hundreds

2. Certain digits are shown on the abacus.



Which of the following numbers can be formed using the digits shown on the abacus?

a. Forty-two thousand, seven hundred and ninety-six

b. Five hundred-thousand, forty-two hundred-thousand, seven hundred ninety-six

c. Fifty-three thousand, seven hundred and ninety-six

d. Fifty-three thousand, seven hundred and nine

Real-World Problem Solving

Analytical Thinking

Robin has 5 blocks with the digits 8, 3, 5, 2, and 9 written on them. She wants to make numbers using these digits.

Observe the information above and cross (✗) the correct answer.

1. The smallest 5-digit number, using all digits only once, is _____.

a. 23,895
c. 23,598
b. 23,589
d. 23,859

2. The place value of 8 in the greatest 5-digit number, using each digit only once, is _____.

a. 80
c. 8,000
b. 800
d. 80,000

Activity Zone

Think Deep

Objective : To understand place value.

You can perform the following activity with your partner.

- Make a place value chart containing ones, tens, hundreds, and thousands place.

Thousands	Hundreds	Tens	Ones

- Write the ten digits below on separate cards.

0 1 2 3 4 5 6 7 8 9

- Place the cards face down on a table.
- Pick any three random cards and place them on your chart. Ask your partner to read the number aloud.
- Make a different number using the same the cards.
- Ask your partner to tell which number is greater.
- Discus how changing the order of the cards affects the number.
- Now pick four cards and place them on the chart.
- Repeat steps 5, 6, and 7.
- Using the same cards, try to make as many different numbers as possible.
- Write all the numbers you made in ascending order.
- Think and find out how you can make the greatest and the smallest numbers using those four cards.