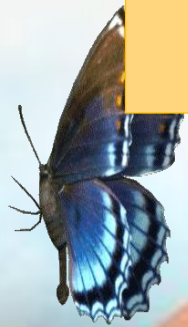# Addition and Subtraction

Notes

In Class III, we have already learnt the methods of addition and subtraction of 4-digit numbers. In the same way, we can also add the 5-digit and 6-digit numbers.

ADDITION (Without Carrying)

EXAMPLE 1 : Find the sum of 32543 and 23215.

	T-Th	Th	H	T	O	
	3	2	5	4	3	Addends
+	2	3	2	1	5	Addends
	5	5	7	5	8	Sum

Sum ∴ **32543 + 23215 = 55758**

Addends   **Sum**

NOTE   **The numbers to be added are called addends.**
The result obtained after adding is called sum.

EXAMPLE 2 : Add 32573, 24115 and 41211.

SOLUTION : Write the given numbers in proper columns and go on adding ones, tens, hundreds, thousands and ten thousands.

	T-Th	Th	H	T	O	
	3	2	5	7	3	← Addends
+	2	4	1	1	5	← Addends
+	4	1	2	1	1	← Addends
	9	7	8	9	9	← Sum

T-Th	Th	H	T	O	
3	2	5	7	3	← Addends
+ 2	4	1	1	5	← Addends
+ 4	1	2	1	1	← Addends
9	7	8	9	9	← Sum

3 + 5 + 1 = 9 ones

7 + 1 + 1 = 9 tens

5 + 1 + 2 = 8 hundreds

2 + 4 + 1 = 7 thousands

3 + 2 + 4 = 9 ten-thousands

T-Th	Th	H	T	O	
3	2	5	7	3	← Addends
+ 2	4	1	1	5	← Addends
+ 4	1	2	1	1	← Addends
9	7	8	9	9	← Sum

Hence, 32573 + 24115 + 41211 = 97899.

ADDITION (With Carrying)

EXAMPLE : Find the sum of 246259 and 357252.

SOLUTION :

L	T-Th	Th	H	T	O	
[1]	[1]		[1]	[1]		← Carry
2	4	6	2	5	9	
+ 3	5	7	2	5	2	
6	0	3	5	1	1	
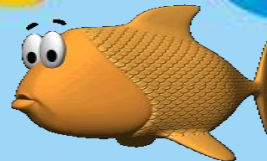
Steps

1. **Addition of ones :** 9 + 2 = 11 ones = 1 ten + 1 one (Write 1 in ones column).

2. **Addition of tens :** 5 + 5 + 1 = 11 tens = 1 hundred + 1 ten (Write 1 in tens column).

3. **Addition of hundreds :** 2 + 2 + 1 = 5 hundreds (Write 5 in hundreds column).

4. **Addition of thousands :** 6 + 7 = 13 thousands = 1 ten-thousands + 3 thousands (Write 3 in thousands column).

5. **Addition of ten-thousands :** 4 + 5 + 1 = 10 ten-thousands = 1 lakh + 0 ten-thousands (Write 0 in ten-thousands column.)

6. **Addition of lakhs :** 2 + 3 + 1 = 6 lakhs (Write 6 in lakhs column.)

Hence, the sum of 246259 and 357252 is **603511.**

EXAMPLE : Find the sum of 146223, 132572, 154328 and 52732.

SOLUTION :

L	T-Th	Th	H	T	O
1	1	1	1	1	←Carry
1	4	6	2	2	3
+ 1	3	2	5	7	2
+ 1	5	4	3	2	8
+	5	2	7	3	2
4	**8**	**5**	**8**	**5**	**5**

$3 + 2 + 8 + 2 = 15 = \boxed{1}\,5$

$2 + 7 + 2 + 3 + \boxed{1} = 15 = \boxed{1}\,5$

$2 + 5 + 3 + 7 + \boxed{1} = 18 = \boxed{1}\,8$

$6 + 2 + 4 + 2 + \boxed{1} = 15 = \boxed{1}\,5$

$4 + 3 + 5 + 5 + \boxed{1} = 18 = \boxed{1}\,8$

$1 + 1 + 1 + \boxed{1} = 4$

NOTE If the students get enough practice of writing the digits in proper columns, they need not write the column names and carried over digits. They should follow the simple method as given alongside.

```
    1   4   6   2   2   3
+   1   3   2   5   7   2
+   1   5   4   3   2   8
+       5   2   7   3   2
  ─────────────────────────
    4   8   5   8   5   5
  ─────────────────────────
```

Mental Maths

Replace each * with a correct digit :

```
1.     2  3  0  *  5
   +   2  *  1  7  5
   +   1  *  0  *  5
       ─────────────
       6  8  2  2  *
       ─────────────
```

```
2.     3  4  5  *  2
   +   2  4  *  2  1
   +   *  7  1  2  9
       ─────────────
       *  *  3  7  2
       ─────────────
```

PROPERTIES OF ADDITION

There are two properties of addition. As we have read in Class III, one is 'Order Property of Addition' and another is 'Property of Zero' in Addition ?

A. ORDER PROPERTY OF ADDITION

We can add two or more numbers in any order and the sum remains the same.

EXAMPLE : Find the sum of 23411, 24516 and 33412.

SOLUTION : We can arrange the addends in different order as under :

1)
```
    2  3  4  1  1
 +  2  4  5  1  6
 +  3  3  4  1  2
 _____
    8  1  3   3  9
```

2)
```
    2  3  4  1  1
 +  3  3  4  1  2
 +  2  4  5  1  6
 _____
    8  1  3   3  9
```

3)
```
    3  3  4  1  2
 +  2  3  4  1  1
 +  2  4  5  1  6
 _____
    8  1  3   3  9
```

4)

```
    3  3  4  1  2
+   2  4  5  1  6
+   2  3  4  1  1
───────────────────
    8  1  3  3  9
```

5)

```
    2  4  5  1  6
    2  3  4  1  1
+   3  3  4  1  2
───────────────────
    8  1  3  3  9
```

6)

```
    2  4  5  1  6
+   2  3  4  1  1
+   3  3  4  1  2
───────────────────
    8  1  3  3  9
```

Thus,   23411 + 24516 + 33412 = **81339**

23411 + 33412 + 24516 = **81339**

33412 + 23411 + 24516 = **81339**

33412 + 24516 + 23411 = **81339**

24516 + 33412 + 23411 = **81339**

24516 + 23411 + 33412 = **81339**

In all the six cases, the sum is same.

B. PROPERTY OF ZERO IN ADDITION

When zero is added to a number, the sum is the number itself.

EXAMPLE : Add 23568 and 0.

SOLUTION :

```
      2 3 5 6 8                    0
    +       0              + 2 3 5 6 8
      2 3 5 6 8              2 3 5 6 8
```

Thus, 23568 + 0 = 23568   or   0 + 23568 = 23568

PROBLEMS ON ADDITION

EXAMPLE : The cost of a car is ₹ 182572, the cost of a scooter is ₹ 21575 and the cost of a bicycle is ₹ 2560. Find their total cost.

SOLUTION :

The cost of a car = ₹ 182572

The cost of a scooter = ₹ 21575

The cost of a bicycle = ₹ 2560

Their total cost = ₹ 182572 + ₹ 21575 + ₹ 2560
= ₹ 206707

Thus, the total cost of these vehicles is ₹ 206707.

Working

```
    1 8 2 5 7 2
 +    2 1 5 7 5
 +       2 5 6 0
 _____
    2 0 6 7 0 7
 _____
```

EXAMPLE : The cost of a flat is ₹ 20575 more than a car. If the cost of the car is ₹ 220575, find the total cost of the flat and the car.

The cost of the flat = ₹ 241150

The cost of the car= ₹ 220575

Their total cost = ₹ 241150 + ₹ 220575 = ₹ 461725

the total cost of the car and the flat is ₹ 461725.

Working

$$
\begin{array}{r}
2\ 4\ 1\ 1\ 5\ 0 \\
+\ \underline{2\ 2\ 0\ 5\ 7\ 5} \\
\underline{4\ 6\ 1\ 7\ 2\ 5}
\end{array}
$$

SUBTRACTION (Without Borrowing)

EXAMPLE : Subtract 34561 from 48974.

SOLUTION : Arrange the digits of given numbers in proper columns

T-Th	Th	H	T	O
4	8	9	7	4
– 3	4	5	6	1
1	4	4	1	3

Subtracting ones :   4 – 1 = 3

Subtracting tens :   7 – 6 = 1

Subtracting hundreds :   9 – 5 = 4

Subtracting thousands :   8 – 4 = 4

Subtracting ten-thousands : 4 – 3 = 1

```
T-Th  Th  H  T  O
   4   8   9  7  4
–  3   4   5  6  1
   1   4   4  1  3
```

48974 – 34561 = 14413.

Thus, **Minuend** **Subtrahend** **Difference**

The greater number is called minuend.
The smaller number is called subtrahend.
The answer is called the difference.

EXAMPLE : Find the difference between 254382 and 368997.

SOLUTION : Here, the number 368997 is the minuend and 254382 is the subtrahend.

L	T-Th	Th	H	T	O	
3	6	8	9	9	7	Minuend
– 2	5	4	3	8	2	Subtrahend
1	1	4	6	1	5	Difference

Thus, 368997 – 254382
= 114615

Steps
Subtracting ones : 7 – 2 = 5
Subtracting tens : 9 – 8 = 1
Subtracting hundreds : 9 – 3 = 6
Subtracting thousands : 8 – 4 = 4
Subtracting ten-thousands : 6 – 5 = 1
Subtracting lakhs : 3 – 2 = 10

SUBTRACTION (With Borrowing)

EXAMPLE : Subtract 45898 from 84345.

SOLUTION :

T-Th	Th	H	T	O	
7	13	12	13	15	After borrowing
8	4	3	4	5	Minuend
– 4	5	8	9	8	Subtrahend
3	8	4	4	7	Difference

SUBTRACTION (With Borrowing)

Steps

1. We can't subtract 8 ones from 5 ones as 5 < 8.
   We borrow 1 ten from tens column.
   5 ones + 1 ten = 5 + 10 = 15 ones.
   Now, 15 ones – 8 ones = 7 ones (Write 7 in ones column)

SUBTRACTION (With Borrowing)

2. In tens column, we have borrowed 1 ten from 4 tens.
     So, only 4 – 1 = 3 tens remain.
     We can't subtract 9 tens from 3 tens.
    So, we borrow 1 hundred from 3 hundreds leaving behind
     2 hundreds.
     3 tens + 1 hundred = 3 tens + 10 tens = 13 tens.
      Now, 13 tens – 9 tens = 4 tens (Write 4 in tens column).

SUBTRACTION (With Borrowing)

3. In hundreds column, we can't subtract 8 hundreds from
    2 hundreds. So, we borrow 1 thousand from 4 thousands,
    leaving behind 3 thousands.
    2 hundreds + 1 thousand = 2 hundreds + 10 hundreds =
    12 hundreds.
    Now, 12 hundreds – 8 hundreds = 4 hundreds
    (Write 4 in hundreds column).

SUBTRACTION (With Borrowing)

4. In thousands column, we can't subtract 5 thousands from 3 thousands.
   We borrow 1 ten-thousand from 8 ten-thousands leaving behind 7 ten-thousands.
   3 thousands + 1 ten-thousand = 3 thousands + 10 thousands = 13 thousands
   Now, 13 thousands – 5 thousands = 8 thousands
   (Write 8 in thousands column.)

5. In ten-thousands column, we subtract 4 ten-thousands from 7 ten-thousands to get 7 – 4 = 3 ten-thousands.

Hence, 84345 – 45898 = 38447.

EXAMPLE : Find the difference between 146762 and 84528.

SOLUTION :

L	T-Th	Th	H	T	O	
0	14			5	12	After borrowing
1	4	6	7	6	2	Minuend
–	8	4	5	2	8	Subtrahend
6		2	2	3	4	Difference

Steps

1. **Subtracting the ones** : We can't subtract 8 ones from 2 ones. So, we borrow 1 ten from 6 tens leaving behind 5 tens. 2 ones + 1 ten = 2 + 10 = 12 ones Now, 12 ones – 8 ones = 4 ones.

2. **Subtracting the tens** : 5 tens – 2 tens = 3 tens

3. **Subtracting the hundreds :** 7 hundreds – 5 hundreds = 2 hundreds

4. **Subtracting the thousands :** 6 thousands – 4 thousands = 2 thousands

5. **Subtracting the ten-thousands :** We can't subtract 8
   ten-thousands from
   4 ten-thousands.
   We borrow 1 lakh from lakhs place and hence nothing
   remains there.
   4 ten-thousands + 1 lakh = (4 + 10) ten-thousands
    = 14 ten-thousands.
  Now, 14 ten-thousands – 8 ten-thousands = 6 ten-thousands

   Hence, the difference is 62234.

EXAMPLE : Subtract 348 from 2454 and verify the answer.

SOLUTION : Here, 2454 is the minuend and 348 is the subtrahend.

Arrange the minuend and subtrahend as shown here.

Hence, the required difference is 2106.

Working

```
  2 4 5 4   Minuend
 – 3 4 8   Subtrahend
  2 1 0 6   Difference
```

To verify the answer, we add the difference
to the subtrahend, and get the minuend.

$$\begin{array}{lr} \text{Difference} & 2\ 1\ 0\ 6 \\ \text{Subtrahend} & +\ 3\ 4\ 8 \\ \hline & 2\ 4\ 5\ 4 \quad \text{Minuend} \end{array}$$

Hence, the answer is verified and it is correct.

PROBLEMS ON SUBTRACTION

EXAMPLE : The sum of two numbers is 245892. If one of them is 183681, find the other number.

SOLUTION : Sum of two numbers = 2 4 5 8 9 2

One number = 1 8 3 6 8 1

Other number = 2 4 5 8 9 2 – 1 8 3 6 8 1

= 6 2 2 1 1

Hence, the other number is 62211.

PROBLEMS ON SUBTRACTION

EXAMPLE : There are 90981 bags of wheat in a godown. If 24579 bags are taken out, how many bags of wheat remain in the godown ?

SOLUTION : Total bags in godown = 90981 bags

Bags are taken out = 24579 bags

Bags remain in godown = 90981 – 24579 bags

= 66402 bags

Hence, 66402 bags of wheat are remaining.

WORD PROBLEMS ON MIXED OPERATIONS (ADDITION AND SUBTRACTION)

EXAMPLE : Price of a car in the year 2008 was ₹ 459645. Its price in the year 2009 was increased by ₹ 64795. But, its price in the year 2010 was reduced by ₹ 45608. Find price of the car in the year 2010.

WORD PROBLEMS ON MIXED OPERATIONS (ADDITION AND SUBTRACTION)

EXAMPLE : Price of a car in the year 2008 was ₹ 459645. Its price in the year 2009 was increased by ₹ 64795. But, its price in the year 2010 was reduced by ₹ 45608. Find price of the car in the year 2010.

SOLUTION :

Price of the car in the year 2008 = ₹ 459645

Price of the car in the year 2009 = ₹ 459645 + ₹ 64795 = ₹ 524440

Now, price of the car in the year 2010 =

₹524440 – ₹45608 = ₹478832

Hence, price of the car in the year 2010 is ₹478832.

EXAMPLE **: In the first day of a cricket match, there were 84600 people in the stadium. On the second day, the crowd was of 66875 people. On the third day, there were 22605 people more than the second day. Find the difference between the number of spectators on the first and third day.**

SOLUTION :

Number of people in the second day = 66875.

Number of people in the third day = 66875 + 22605 = 89480

Now, the difference between the numbers of spectators on the first and third day = 89480 – 84600 = 4880

Hence, the difference between the numbers of spectators on the first and third day is 4880.