

## 2. Addition

### You Know

- ♦ addition of 2-digit numbers without and with regrouping
- ♦ addition of 3-digit numbers without and with regrouping

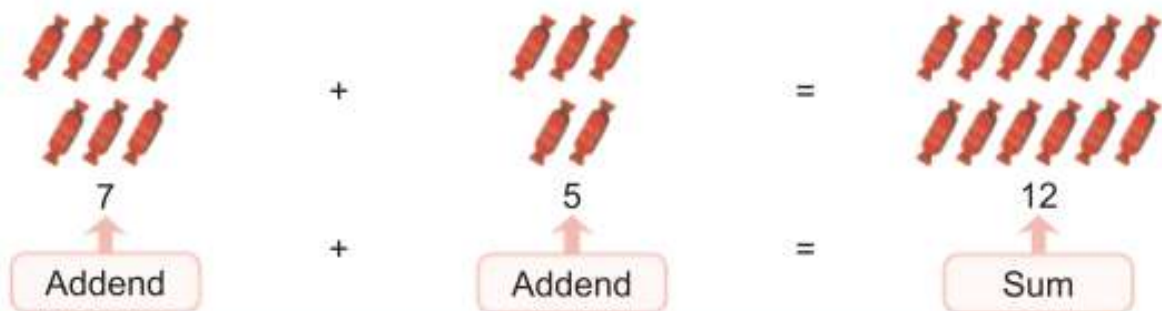
### You will Learn

- ♦ addition of 4-digit numbers without and with regrouping
- ♦ addition of three numbers
- ♦ properties of addition
- ♦ addition by 10, 100 and 1000
- ♦ to estimate the sum by rounding off



### Kick Start

**Addition** means **putting two or more numbers together**. '+' is the symbol used to denote addition.



The numbers that are added are called the **addends**.

The answer obtained after adding the numbers is called the **sum**.

### Addition of 3-digit Numbers

#### Without Regrouping

**Example 1** Add 135 and 241.

**Solution:**

**Step 1:** Arrange the numbers in columns as per their place values one below the other.

**Step 2:** Add the ones.

5 ones + 1 one = 6 ones

**Step 3:** Add the tens.

3 tens + 4 tens = 7 tens

	H	T	O
	1	3	5
+	2	4	1
	3	7	6

**Step 4:** Add the hundreds.

1 hundred + 2 hundreds = 3 hundreds

Thus,  $135 + 241 = 376$

### With Regrouping

**Example 2** Add 378 and 495.

**Solution:**

**Step 1:** Arrange the numbers in columns as per their place values one below the other.

	H	T	O
	3	7	8
+	4	9	5

**Step 2:** Add the ones.

8 ones + 5 ones = 13 ones

13 ones = 1 ten + 3 ones

Write 3 in the ones column and carry over 1 to the tens column.

	H	T	O
		1	
	3	7	8
+	4	9	5
			3

**Step 3:** Add the tens.

7 tens + 9 tens + 1 ten (carry over) = 17 tens

17 tens = 1 hundred + 7 tens

Write 7 in the tens column and carry over 1 to the hundreds column.

	H	T	O
	1	1	
	3	7	8
+	4	9	5
		7	3

**Step 4:** Add the hundreds.

3 hundreds + 4 hundreds + 1 hundred (carry over)

= 8 hundreds

Write 8 in the hundreds column.

Thus,  $378 + 495 = 873$

	H	T	O
	1	1	
	3	7	8
+	4	9	5
	8	7	3

## Let's Exercise

### Exercise 2.1



1. Add the following.

a.

	H	T	O
	6	2	1
+	2	5	3

b.

	H	T	O
	7	4	0
+	1	2	4

c.

	H	T	O
	3	2	5
+	2	6	1

d.

	H	T	O
	4	1	3
+	3	8	5

e.

	H	T	O
	5	4	2
+	3	1	6

f.

	H	T	O
	1	2	6
+	8	4	3

g.

	H	T	O
	3	6	2
+	4	0	7

h.

	H	T	O
	2	5	4
+	1	3	2

2. Arrange the numbers vertically in columns and add.

a.  $235 + 147$

b.  $427 + 438$

c.  $356 + 295$

d.  $179 + 162$

e.  $348 + 594$

f.  $217 + 683$

g.  $274 + 176$

h.  $453 + 387$

## Addition of 4-digit Numbers

### Without Regrouping

**Example 1** Add 4362 and 2514.

**Solution:**

**Step 1:** Arrange the numbers in columns as per their place values one below the other.

**Step 2:** Add the ones.

2 ones + 4 ones = 6 ones

**Step 3:** Add the tens.

6 tens + 1 ten = 7 tens

**Step 4:** Add the hundreds.

3 hundreds + 5 hundreds = 8 hundreds

**Step 5:** Add the thousands.

4 thousands + 2 thousands = 6 thousands

Thus,  $4362 + 2514 = 6876$

	Th	H	T	O
	4	3	6	2
+	2	5	1	4
	6	8	7	6



## With Regrouping

**Example 2** Add 6375 and 3125.

**Solution:**

**Step 1:** Arrange the numbers in columns as per their place values one below the other.

	Th	H	T	O
	6	3	7	5
+	3	1	2	5

**Step 2:** Add the ones.

5 ones + 5 ones = 10 ones

10 ones = 1 ten

Write 0 in the ones column and carry over 1 to the tens column.

	Th	H	T	O
			1	
	6	3	7	5
+	3	1	2	5
				0

**Step 3:** Add the tens.

7 tens + 2 tens + 1 ten (carry over) = 10 tens

10 tens = 1 hundred

Write 0 in the tens column and carry over 1 to the hundreds column.

	Th	H	T	O
		1	1	
	6	3	7	5
+	3	1	2	5
			0	0

**Step 4:** Add the hundreds.

3 hundreds + 1 hundred + 1 hundred (carry over)

= 5 hundreds

Write 5 in the hundreds column.

	Th	H	T	O
		1	1	
	6	3	7	5
+	3	1	2	5
		5	0	0

**Step 5:** Add the thousands.

6 thousands + 3 thousands = 9 thousands

Write 9 in the thousands column.

Thus,  $6375 + 3125 = 9500$

	Th	H	T	O
		1	1	
	6	3	7	5
+	3	1	2	5
	9	5	0	0

## Exercise 2.2

1. Add the following.

a.

	Th	H	T	O
	2	6	3	4
+	1	2	5	3

b.

	Th	H	T	O
	3	0	5	2
+	4	3	1	6

c.

	Th	H	T	O
	5	1	4	3
+	3	6	2	0

d.

	Th	H	T	O
	6	2	1	4
+	2	1	7	3

e.

	Th	H	T	O
	8	6	4	2
+	1	1	3	5

f.

	Th	H	T	O
	3	6	5	4
+	4	2	1	2

2. Arrange the numbers vertically in columns and add.

a.  $1873 + 2345$

b.  $6754 + 1478$

c.  $3257 + 5866$

d.  $6972 + 2367$

e.  $2654 + 2791$

f.  $3647 + 1856$

g.  $7953 + 1248$

h.  $5348 + 1983$

3. Write the missing numbers.

a.

	Th	H	T	O
	<input type="text"/>	4	<input type="text"/>	2
+	1	<input type="text"/>	0	<input type="text"/>
	7	7	6	8

b.

	Th	H	T	O
	<input type="text"/>	1	4	<input type="text"/>
+	4	<input type="text"/>	<input type="text"/>	2
	6	2	8	5

c.

	Th	H	T	O
	<input type="text"/>	6	<input type="text"/>	5
+	5	<input type="text"/>	3	3
	7	9	7	<input type="text"/>

d.

	Th	H	T	O
	<input type="text"/>	2	<input type="text"/>	<input type="text"/>
+	7	<input type="text"/>	3	0
	9	5	6	0

e.

	Th	H	T	O
	3	0	<input type="text"/>	1
+	5	<input type="text"/>	3	<input type="text"/>
	<input type="text"/>	6	5	4

f.

	Th	H	T	O
	<input type="text"/>	4	<input type="text"/>	5
+	6	3	0	<input type="text"/>
	9	<input type="text"/>	2	9

## Story Sums

**Example 1** Ravi has 267 marbles and Manish has 485 marbles. How many marbles do they have in all?

**Solution:**

Number of marbles with Ravi = 267

Number of marbles with Manish = 485

Total number of marbles =  $267 + 485$

**Ans:** Ravi and Manish have 752 marbles in all.

	H	T	O
	1	1	
	2	6	7
+	4	8	5
	7	5	2

**Example 2** A vegetable seller earned ₹ 2516 on Monday and ₹ 3240 on Tuesday. How much did he earn in these two days?

**Solution:**

Amount of money earned on Monday = ₹ 2516

Amount of money earned on Tuesday = ₹ 3240

Total amount of money earned = ₹ 2516 + ₹ 3240

**Ans:** The vegetable seller earned ₹ 5756 in all.

	Th	H	T	O
	2	5	1	6
+	3	2	4	0
	5	7	5	6

**Example 3** There are 3572 students in the primary section of a school and 1849 students in the secondary section of a school. How many students are there in the school?

**Solution:**

Number of students in the primary section = 3572

Number of students in the secondary section = 1849

Total number of students =  $3572 + 1849$

**Ans:** There are 5421 students in all.

	Th	H	T	O
	1	1	1	
	3	5	7	2
+	1	8	4	9
	5	4	2	1

## Exercise 2.3

Solve the following story sums.

- There were 143 Banyan trees and 247 Ashoka trees in a park. How many trees were there in all?
- The number of tigers in Corbett Tiger Reserve is 215 and Kaziranga Tiger Reserve is 104. Find the total number of tigers in both the reserves.



- c. Soham and his friends went to a beach for a picnic. They collected 546 white shells and 239 black shells. How many shells did they collect in all?
- d. What is the sum of 5243 and 1445?
- e. Find the sum of 6251 and 2479.
- f. 1352 students of School A and 1673 students of School B went to Nepal for the winter break. How many students in all went to Nepal for the winter break?
- g. 4732 children and 2369 adults visited a fair in a day. How many people visited the fair?
- h. A factory made 3518 bags on Monday and 2637 bags on Tuesday. How many bags were made in these two days?

## More about Addition

### Adding Three 3-digit Numbers

**Example 1** Add 243, 127 and 315.

**Solution:**

**Step 1:** Arrange the numbers in columns as per their place values one below the other.

	H	T	O
	2	4	3
	1	2	7
+	3	1	5

**Step 2:** Add the ones.

$$3 \text{ ones} + 7 \text{ ones} + 5 \text{ ones} = 15 \text{ ones}$$

$$15 \text{ ones} = 1 \text{ ten} + 5 \text{ ones}$$

Write 5 in the ones column and carry over 1 to the tens column.

	H	T	O
		1	
	2	4	3
	1	2	7
+	3	1	5
			5

**Step 3:** Add the tens.

$$4 \text{ tens} + 2 \text{ tens} + 1 \text{ ten} + 1 \text{ ten (carry over)} = 8 \text{ tens}$$

Write 8 in the tens column.

	H	T	O
		1	
	2	4	3
	1	2	7
+	3	1	5
		8	5

**Step 4:** Add the hundreds.

2 hundreds + 1 hundred + 3 hundreds = 6 hundreds

Write 6 in the hundreds column.

Thus,  $243 + 127 + 315 = 685$

	H	T	O
		1	
	2	4	3
	1	2	7
+	3	1	5
	6	8	5

### Adding Three 4-digit Numbers

**Example 2** Add 2149, 3872 and 1273.

**Solution:**

**Step 1:** Arrange the numbers in columns as per their place values one below the other.

	Th	H	T	O
	2	1	4	9
	3	8	7	2
+	1	2	7	3

**Step 2:** Add the ones.

9 ones + 2 ones + 3 ones = 14 ones

14 ones = 1 ten + 4 ones

Write 4 in the ones column and carry over 1 to the tens column.

	Th	H	T	O
			1	
	2	1	4	9
	3	8	7	2
+	1	2	7	3
				4

**Step 3:** Add the tens.

4 tens + 7 tens + 7 tens + 1 ten (carry over) = 19 tens

19 tens = 1 hundred + 9 tens

Write 9 in the tens column and carry over 1 to the hundreds column.

	Th	H	T	O
		1	1	
	2	1	4	9
	3	8	7	2
+	1	2	7	3
			9	4

**Step 4:** Add the hundreds.

1 hundred + 8 hundreds + 2 hundreds + 1 hundred (carry over) = 12 hundreds

12 hundreds = 1 thousand + 2 hundreds

Write 2 in the hundreds column and carry over 1 to the thousands column.

	Th	H	T	O
	1	1	1	
	2	1	4	9
	3	8	7	2
+	1	2	7	3
		2	9	4



**Step 5:** Add the thousands.

2 thousands + 3 thousands + 1 thousand + 1 thousand (carry over) = 7 thousands

Write 7 in the thousands column.

Thus,  $2149 + 3872 + 1273 = 7294$

	Th	H	T	O
	1	1	1	
	2	1	4	9
	3	8	7	2
+	1	2	7	3
	7	2	9	4

### Story Sum

**Example 3** 1475 men, 1309 women and 2768 children visited a Science Museum in a week. How many people in all visited the Science Museum?

**Solution:**

Number of men who visited the Science Museum = 1475

Number of women who visited the Science Museum = 1309

Number of children who visited the Science Museum = 2768

Total number of people =  $1475 + 1309 + 2768$

**Ans:** 5552 people visited the Science Museum.

	Th	H	T	O
	1	1	2	
	1	4	7	5
	1	3	0	9
+	2	7	6	8
	5	5	5	2

### Exercise 2.4

1. Add the following.

a.

	Th	H	T	O
	2	0	4	2
	3	1	2	5
+	1	6	0	1

b.

	Th	H	T	O
	6	5	4	1
	2	1	3	5
+	1	2	0	3

c.

	Th	H	T	O
	3	1	5	4
	2	6	0	3
+	1	0	3	2

d.

	Th	H	T	O
	1	3	6	2
	1	5	2	4
+	6	0	1	3

e.

	Th	H	T	O
	5	7	0	8
	3	1	6	0
+	1	0	2	1

f.

	Th	H	T	O
	1	2	5	3
	2	0	1	4
+	5	4	2	0



2. Arrange the numbers vertically in columns and add.
- a.  $1372 + 3719 + 2048$       b.  $5964 + 2408 + 1167$       c.  $2459 + 3821 + 1645$   
 d.  $5047 + 2976 + 1908$       e.  $3109 + 1548 + 1897$       f.  $4256 + 1102 + 2837$
3. Solve the following word problems.
- a. A school library has 3150 Hindi books, 2378 English books and 2577 Mathematics books. How many books are there in the library?
- b. There are 3571 mangoes trees, 2785 pomegranate trees and 1203 chikoo trees in an orchard. How many trees are there in all?
- c. Vishal bought a cricket bat for ₹ 3675, cricket gloves for ₹ 1302 and cricket stumps for ₹ 2578. Find the total amount paid by him.

### Properties of Addition

The sum of two addends remains the same, even if the order of addends is changed.

For example,

(i)  $3560 + 1205 = 4765$       (ii)  $1205 + 3560 = 4765$

When 0 is added to any number, the sum is the number itself.

For example,

(i)  $8916 + 0 = 8916$       (ii)  $7812 + 0 = 7812$       (iii)  $1300 + 0 = 1300$

When 1 is added to any number, the sum is the successor of that number.

For example,

(i)  $3216 + 1 = 3217$       (ii)  $5069 + 1 = 5070$       (iii)  $3000 + 1 = 3001$

### Addition by 10, 100 and 1000

When 10 is added to a number the digit in the tens place of the number increases by 1.

For example,

(i)  $1378 + 10 = 1388$       (ii)  $5263 + 10 = 5273$       (iii)  $8413 + 10 = 8423$

When 100 is added to a number the digit in the hundreds place of the number increases by 1.

For example,

(i)  $3478 + 100 = 3578$

(ii)  $7593 + 100 = 7693$

(iii)  $9145 + 100 = 9245$

When 1000 is added to a number the digit in the thousands place of the number increases by 1.

For example,

(i)  $1325 + 1000 = 2325$

(ii)  $3672 + 1000 = 4672$

(iii)  $8527 + 1000 = 9527$

### Exercise 2.5

1. Fill in the blanks using the properties of addition.

a.  $4218 + 1 = \square$

b.  $6781 + \square = 6781$

c.  $4579 + \square = 4580$

d.  $1572 + 0 = \square$

e.  $1500 + 4000 = \square + 1500$

2. Add the following.

a.  $5718 + 10 = \square$

b.  $6587 + 10 = \square$

c.  $7538 + 1000 = \square$

d.  $3569 + 100 = \square$

e.  $1496 + 1000 = \square$

f.  $4659 + 100 = \square$

### Estimating the Sum

To estimate the sum of numbers, we round off the numbers to the nearest tens. Estimation helps us to get a quick answer. The answer is very close to the actual sum.

**Example 1** Estimate the sum of 39 and 42. Also find their actual sum.

**Solution:**

**Step 1:** Round off the numbers to the nearest tens.

The number 39 lies between 30 to 40. It is close to 40. So, 39 is rounded off to its nearest tens i.e. 40.

The number 42 lies between 40 to 50. It is close to 40. So, 42 is rounded off to its nearest tens i.e. 40.

**Step 2:** Add the rounded off numbers.

Estimated sum		
	T	O
	4	0
+	4	0
	8	0

Actual sum		
	T	O
	3	9
+	4	2
	8	1

Thus, we can say that the estimated sum i.e. 80 is very close to the actual sum i.e. 81.



**Example 2** Estimate the sum of 256 and 142 by rounding off both the numbers to the nearest tens.

**Solution:**

**Step 1:** Round off the numbers to the nearest tens.

256 is closer to 260.

142 is closer to 140.

**Step 2:** Add the rounded off numbers i.e.  $260 + 140$

Thus, the estimated sum of both the numbers is 400.

Estimated sum			
	H	T	O
	2	6	0
+	1	4	0
	4	0	0

## Exercise 2.6

Estimate the sum by rounding off the given numbers to the nearest tens. Also find the actual sum.

a.  $78 + 34$

b.  $92 + 17$

c.  $65 + 33$

d.  $48 + 36$

e.  $735 + 121$

f.  $386 + 253$

g.  $187 + 419$

h.  $675 + 136$

## Math Lab Activity

**Objective:** To be able to add large numbers

**Materials required:** Two sets of digit cards (0-9)

**Procedure:**

1. Form groups of 6.

2. Take 2 sets of digit cards for your group.

3. Perform the following task:

- Student A - Select 4 digit cards and form the greatest 4-digit number using them.
- Student B - Select another 4 digit cards and form the smallest 4-digit number using them.
- Student C - Find the sum of the numbers formed.
- Student D - Select 4 digit cards and form the greatest 4-digit number using them.
- Student E - Select another 4 digit cards and form the smallest 4-digit number using them.
- Student F - Find the sum of the numbers formed.

4. Compare the sum and note the same in your notebook.

1	2	3	4	5
6	7	8	9	0

- Now shuffle the cards and start another round.
- Interchange roles of students among your group.



## Math Challenge

The sum of the shapes in each row is given. Find the value of each shape.

				19
				17
				16
				20
20	15	17	20	

= 6
=
=
=

## Math Around Me

Paper was invented in China in 105 A.D. Ts'ai Lun (Cai Lun) an official of the Imperial Court invented paper. This invention took place during the rule of Han Dynasty.



The word paper is derived from 'papyrus'. Papyrus is a thick paper like material produced from the pith of Cyperus papyrus plant. It was used in ancient Egypt before paper was introduced.

Apart from writing work, papers were mainly used for making tea bags, hats, paper curtains etc. They were used for wrapping mirrors and medicines. Later, paper money was also introduced.



- If 1568 paper sheets were used to make tea bags and 5894 sheets were used to make paper money, then how many paper sheets were used in all?

Today we use papers for manufacturing a lot of things like newspapers, toiletries, books, handicrafts, paper art (origami) etc.

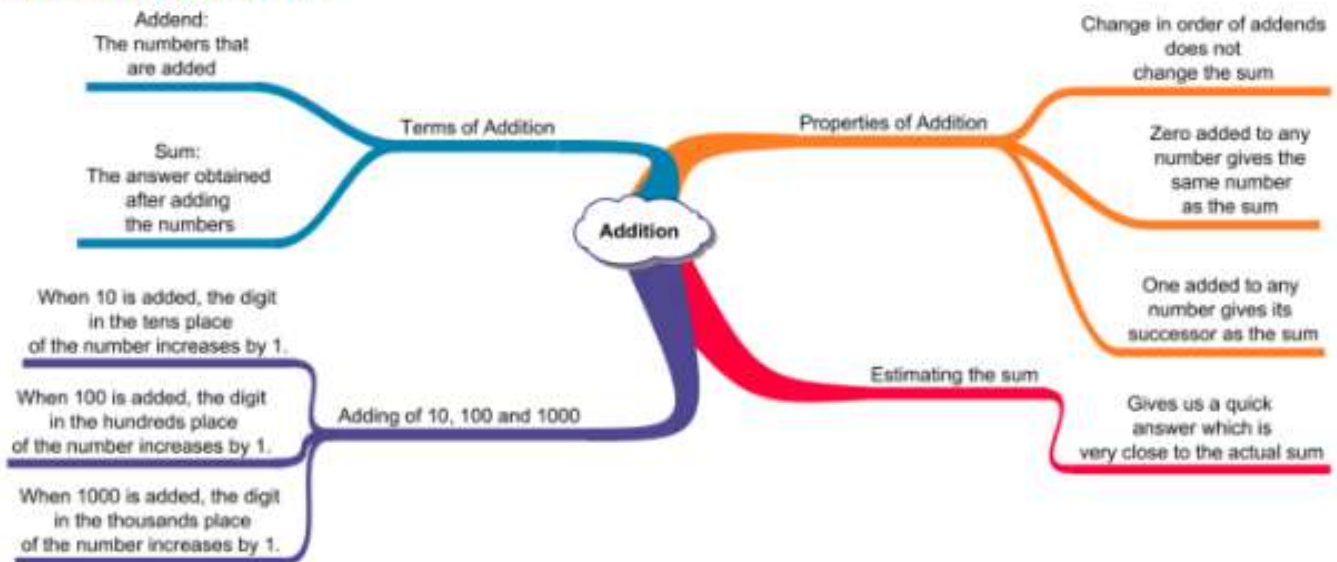


2. If 4563 origami lotus flowers and 3621 origami swans were made for a Children's Day party, then how many origami items were made?

### Paper Fact!

It takes 7 days for a recycled newspaper to come back as a paper again.

## Let's Summarize



## Revision Exercise

1. Add the following.

a.

	Th	H	T	O
	1	3	2	6
+	5	4	5	2

b.

	Th	H	T	O
	4	3	2	1
+	3	2	6	8

c.

	Th	H	T	O
	6	4	3	2
+	2	5	6	7

d.

	Th	H	T	O
	7	5	8	3
+	1	6	4	2

e.

	Th	H	T	O
	5	9	6	1
+	1	6	5	3

f.

	Th	H	T	O
	3	4	8	5
+	4	7	3	6

2. Solve the following sum vertically.

a.  $289 + 146$

b.  $367 + 458$

c.  $2674 + 7120$

d.  $3596 + 4275$

e.  $5264 + 1793$

f.  $1284 + 3945 + 2591$

g.  $4653 + 2034 + 3216$

h.  $1326 + 5749 + 1245$

i.  $4572 + 1176 + 2731$



3. Fill in the blanks.

a.  $2364 + 0 = \boxed{\phantom{0000}}$

b.  $6246 + 1 = \boxed{\phantom{0000}}$

c.  $3324 + 6345 = 6345 + \boxed{\phantom{0000}}$

d.  $2763 + 5436 = \boxed{\phantom{0000}} + 2763$

e.  $7284 + 1000 = \boxed{\phantom{0000}}$

f.  $7284 + 100 = \boxed{\phantom{0000}}$

g.  $7284 + 10 = \boxed{\phantom{0000}}$

4. Write the missing numbers.

a.

	Th	H	T	O
	<input type="text"/>	7	4	<input type="text"/>
+	6	<input type="text"/>	4	7
	9	8	<input type="text"/>	6

b.

	Th	H	T	O
	5	5	<input type="text"/>	0
+	<input type="text"/>	<input type="text"/>	0	<input type="text"/>
	7	9	9	2

c.

	Th	H	T	O
	<input type="text"/>	<input type="text"/>	7	<input type="text"/>
+	2	1	<input type="text"/>	3
	8	7	0	1

d.

	Th	H	T	O
	<input type="text"/>	1	1	<input type="text"/>
+	1	<input type="text"/>	<input type="text"/>	1
	3	2	1	0

5. Find the estimated sum of the following by rounding off to the nearest tens.

a.  $27 + 52$

b.  $69 + 31$

c.  $157 + 389$

d.  $235 + 578$

6. Solve the following story sums.

- Sujata collected 235 red beads and 167 yellow beads. How many beads did she collect in all?
- There are 716 men, 683 women and 249 children staying in a society. Find the total number of people staying in the society.
- Vinita had 2863 apple trees in one orchard and 1450 apple trees in another orchard. How many apple trees are there in all?
- A company manufactured 1345 blue pens and 2487 red pens. How many pens were manufactured in all?
- Rohan spent ₹ 2467 on grocery, ₹ 1345 on medicines and ₹ 1170 on fruits when he went shopping. Find the total amount of money spent by him.
- Rishi and his friends collected 2469 shirts, 1575 trousers and 2890 sarees for donating in different old age homes. How many clothes did they collect in all?

### Weblinks

<https://www.splashmath.com/addition-games-for-3rd-graders>

[https://www.mathplayground.com/number\\_conundrum\\_whole.html](https://www.mathplayground.com/number_conundrum_whole.html)

<https://www.turtlediary.com/game/addition-equations.html>

As on 14.03.2019