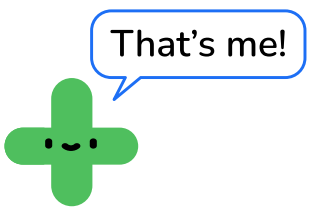
Written Addition

Addition is the calculation we use to find the **total** of two or more numbers. We can also call this a **sum**.

We use the **plus** symbol for addition: **+**



A lot of sums can be calculated mentally, but with bigger numbers it is usually easier to use a written method called **column addition**.

1 We line up the numbers in columns, by **place value**.

For example, we line up 36,271 and 6,148 by making sure the **ones** are in the same column.

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

2 Then we add the numbers, column by column, **starting with the rightmost column**.

1 + 8 = 9

7 + 4 = 11

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

→

	Th	H	T	O
	3	6	2^{1}	7	1
+		6	1	4	8
				1	9

We exchange 10 tens for 1 hundred

3 We continue solving each column one by one, going left.

1 + 2 + 1 = 4

6 + 6 = 12

1 + 3 = 4

	Th	H	T	O
	3	6	2^{1}	7	1
+		6	1	4	8
			4	1	9

→

	Th	H	T	O
	3^{1}	6	2^{1}	7	1
+		6	1	4	8
		2	4	1	9

→

	Th	H	T	O
	3^{1}	6	2^{1}	7	1
+		6	1	4	8
	4	2	4	1	9

The sum is **42,419**!

Example Question

What is the missing digit in the following addition?

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

A 3 B 4 C 6 D 7 E 8

1 There are no exchanges in the ones or tens column. Let's move on!

2 In the **hundreds column**, we can see that an **exchange** occurs.

4 + 9 = 13

10 hundreds are **exchanged** for 1 thousand.

We add a little 1 in the **thousands column**.

	Th	H	T	O
	2	6^{1}	4	7	3
+	6	□	9	1	5
	9	3	3	8	8

3 Now we can just solve the calculation in the thousands column, using number facts.

1 + 6 + □ = 3 — This is impossible! There must be an **exchange**.

1 + 6 + □ = **1**3 — Now we can fill in the gap: 1 + 6 + **6** = 13

The missing digit is **6**!

We were right about the exchange! We add a 1 to the **ten thousands** column to find that **1** + 2 + 6 = 9.

	Th	H	T	O
	2^{1}	6^{1}	4	7	3
+	6	6	9	1	5
	9	3	3	8	8