



# Addition

## adding and subtracting vertically (and trading)

When children are learning to add and subtract larger numbers they can use what is called a vertical algorithm.

One number is placed above the other number according to its value (hundreds, tens and ones). In this step-by-step method the numbers are added or subtracted vertically in the **ONES**, then **TENS**, then **HUNDREDS** columns. A place value chart is used to show this process.

It may require trading. **Trading** is changing a quantity into smaller or bigger parts, without changing its value.

### Using the vertical algorithm without trading

**Addition**  $135 + 54 = ?$

Hundreds	Tens	Ones
1	3	5
+	5	4
1	8	9

+

The sum of these digits is less than 10 so no trading to the TENS is needed.

**Subtraction**  $257 - 43 = ?$

Hundreds	Tens	Ones
2	5	7
-	4	3
2	1	4

-

Less TENS are being taken away, so no trading is needed.

## Using the vertical algorithm with trading

**Addition**  $234 + 58 = ?$

Addition problems will involve trading when you add digits in a column and they make more than 10.

Hundreds	Tens	Ones
2	3	4
+	5	8
2	9	2

Diagram description: A vertical addition table for 234 + 58. The columns are labeled Hundreds, Tens, and Ones. The first row shows 2, 3, and 4. The second row shows a plus sign, 5, and 8. The third row shows the result: 2, 9, and 2. A red dashed circle highlights the 4 and 8 in the Ones column. A red arrow points from the 4 to the 8, and another red arrow points from the 8 to the 2 in the Tens column. A third red arrow points from the 2 in the Tens column to the 1 in the Hundreds column.

4 ones + 8 ones = 12 ones.

We don't put more than 9 in a column.

12 = 1 TEN and 2 ONES so we trade 10 ONES for 1 TEN.

The 1 TEN goes to the TENS column and the 2 remaining ONES stay in their column.

All the TENS in the column are now added together.

**Subtraction**  $245 - 28 = ?$

Subtraction problems will involve trading if there are more ONES, TENS, HUNDREDS in the number being taken away.

This means the children will have to trade some from the larger column, ie ONES will trade with TENS, TENS will trade with HUNDREDS etc.

Hundreds	Tens	Ones
2	<sup>3</sup> <del>4</del>	<sup>1</sup> <del>5</del>
-	2	8
2	1	7

Diagram description: A vertical subtraction table for 245 - 28. The columns are labeled Hundreds, Tens, and Ones. The first row shows 2, 4, and 5. The second row shows a minus sign, 2, and 8. The third row shows the result: 2, 1, and 7. A red dashed circle highlights the 5 and 8 in the Ones column. A red arrow points from the 5 to the 8. Another red arrow points from the 4 in the Tens column to the 5 in the Ones column. A third red arrow points from the 2 in the Tens column to the 4 in the Hundreds column.

We can't take 8 away from 5.

There are more ONES in the number being taken away, so we need to trade 1 TEN into the ONES column to give us 15 ONES.  
15 ONES - 8 ONES = 7 ONES

Now we only have 1 TEN left.