YR5 ADDITION AND SUBTRACTION KNOWLEDGE ORGANISER

Key Concepts

- Add whole numbers with more than 4-digits
- Subtract whole numbers with more than 4-digits
- Estimate
- Inverse operations

Key Vocabulary

- add/addition
- subtract/subtraction
- calculate/calculation
- mental calculation
- written method
- operation
- total
- amount
- exchange
- regroup
- inverse
- estimate

Addition and Subtraction Vocabulary

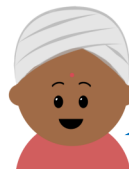> add   total   combined   more   increase   plus   altogether   sum

➕

> minus   take away   reduce   less than   difference   decrease   fewer than

➖

Inverse Operations

Inverse means opposite. The opposite of addition is subtraction and therefore the opposite of subtraction is addition. Using an inverse operation is a useful way of checking your answer.

> I have calculated that 14,257 - 5,483 = 8,774. How can I check my answer?

> To check the answer to your subtraction, you can use the i**nverse**, which is addition. If we add 5,483 to your answer of 8,774 it should total 14,257 - your original number. If it does, you have calculated correctly.

Estimate Answers

Estimating means to get a rough idea of an answer . We can use estimation to help us check if an answer to a calculation is correct.

> I am calculating 23,478 + 12,983. I think the answer is 34,461.
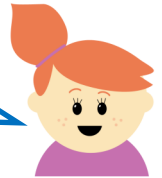
> I am also calculating 23,478 + 12,983. I think the answer is 36,461.

Millie and Alfie could check their answers by doing the calculation again. However, if they have made a mistake, they may just make the same mistake again.

Instead, they could use **rounding** to check if their answer is correct.

> We can round the numbers to the nearest hundred.   So 23,478 + 12,983 becomes 23,500 + 13,000.
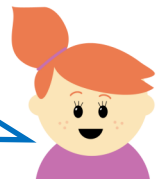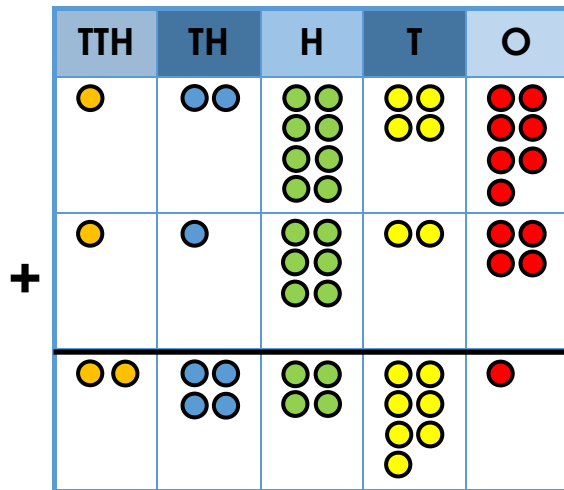
> 23,500 + 13,000 = 36,500.
>
> Now we compare our estimate to the actual answers given.   The answer 36,461 is very close to the estimate of 36,500 so that tells us it is more likely to be correct.

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Addition - Formal Written Methods

Using counters to show column addition:

TTH	TH	H	T	O
●	●●	●●●●●●●●●	●●●●	●●●●●●●
●	●	●●●●●●●	●●	●●●●
●●	●●●●	●●●●	●●●●●●●●●	●

+

	1	2	8	4	7
+	1	1	6	2	4
	2	4	4	7	1
		1		1	

With column addition and subtraction, you must always start the calculation with the column on the right. 7 + 4 is 11. We can not put 11 in the ones column so a ten is placed under the tens column and the one is placed in the ones column. We then add the extra ten when we add that column.

Subtraction - Formal Written Methods

Using counters to show column subtraction:

TTH	TH	H	T	O
●●	●	●●●●	●●●●●●	●●
	●●	●●	●●●●	●●●●

-
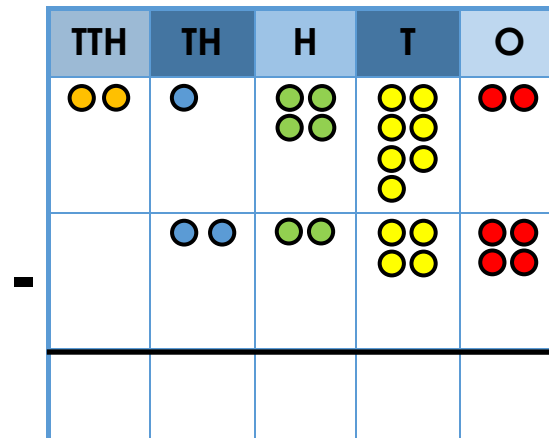
	2	1	4	7	2
-		2	2	4	4

In the ones column, we don't have enough to subtract 4 from 2. We need to exchange a ten for ten ones.

To show this, the 7 is changed to a 6 because we now have 6 tens. The 2 becomes a 12. 72 is the same as 60 + 12. We still have the same amount, but it has been regrouped. Now we can start subtracting.

12 - 4 = 8 so 8 is written in the ones column.

In the tens column, 6 - 4 = 2 so 2 is written in the tens column.

	2	1	4	6̶7	¹2
-		2	2	4	4
				2	8

The hundreds column is a straight forward calculation: 4 - 2 = 2.

Looking at the thousands column, we do not have enough to subtract 2 from 1. We need to exchange one of the ten thousands for 10 thousands. To show this, the 2 (in the ten thousands place) is changed to a 1. The 1 (thousand) becomes an 11. 11 - 2 = 9.

Finally, looking at the ten thousands column, 1 - 0 = 1. The final answer to the subtraction is 19,228.

	¹2̶	¹1	4	6̶7	¹2
-		2	2	4	4
	1	9	2	2	8