Everyday Mathematics

Trade-First Subtraction Algorithm (Focus Algorithm)

Trade-First Subtraction Algorithm

Trade-first subtraction involves:

- Figuring out the place value of digits,

- Making decisions about where trades are necessary,

- Trading first before doing any subtraction, and

- Focusing on the subtraction in one place-value column at a time.

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Trade-First Subtraction Algorithm

The trade-first subtraction algorithm looks very similar to the "traditional" method of subtracting. The key difference is that with the trade-first subtraction algorithm, *all* trades are completed before any subtracting.
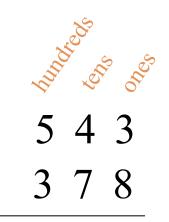
You can perform the trades beginning from the right or the left. When children are first introduced to the algorithm, they may prefer to draw vertical lines separating the columns.

Solve $543 - 378$ using the trade-first subtraction algorithm.

Trade-First Subtraction Algorithm

Solve 543 – 378.

Set up the problem.

Write the numbers in their place-value columns.

hundreds   tens   ones

$$
\begin{array}{r}
5\ \ 4\ \ 3 \\
-\ \ 3\ \ 7\ \ 8 \\
\hline
\end{array}
$$

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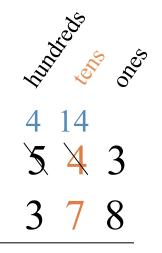
Trade-First Subtraction Algorithm

Solve 543 – 378.

Decide where trades need to be made.

The tens require a trade.

Go to the hundreds place and break one of the 5 [100s] into 10 [10s]. We now have 4 [100s] and 14 [10s].

$$
\begin{array}{r}
\text{hundreds} \quad \text{tens} \quad \text{ones} \\
4 \quad 14 \\
\cancel{5} \quad \cancel{4} \quad 3 \\
- \quad 3 \quad 7 \quad 8 \\
\hline
\end{array}
$$

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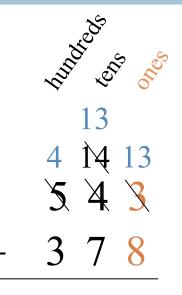
Trade-First Subtraction Algorithm

Solve 543 – 378.

Decide where trades need to be made.

The ones also require a trade.

Go to the tens place and break one of the 14 [10s] into 10 [1s]. We now have 13 [10s] and 13 [1s].

$$
\begin{array}{r}
\overset{\text{hundreds}}{} \; \overset{\text{tens}}{} \; \overset{\text{ones}}{} \\
13 \\
4 \quad \cancel{14} \quad 13 \\
\cancel{5} \quad \cancel{4} \quad \cancel{3} \\
- \quad 3 \quad 7 \quad 8 \\
\hline
\end{array}
$$

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Trade-First Subtraction Algorithm

Solve 543 – 378.

Now we're ready to subtract.

At this point, the order in which the steps are completed will not matter.

Subtract in the hundreds, tens, and ones columns.

$$
\begin{array}{ccc}
\text{hundreds} & \text{tens} & \text{ones} \\
 & 13 & \\
4 & \cancel{14} & 13 \\
\cancel{5} & \cancel{4} & \cancel{3} \\
- \quad 3 & 7 & 8 \\
\hline
1 & 6 & 5 \\
\end{array}
$$

Trade-First Subtraction Algorithm

$543 - 378 = 165$

Note that when children use the trade-first subtraction algorithm to solve an subtraction problem, they have an opportunity to practice a variety of skills related to developing number sense and algebraic reasoning.

These skills include:

- *Writing numbers according to the place value of the digits*

- *Breaking a hundred as 10 [10s]; breaking a ten as 10 [1s]*

- *Renaming numbers after shifting a group of 10 [10s] or 10 [1s] to the column to its right*

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Trade-First Subtraction Algorithm

543 – 378 = 165

With the trade-first subtraction method, children easily talk about the place-value columns within which they are working. Because all trades are completed first, the procedure itself is simplified.

Finally, if children trade where it is not necessary, they can adjust their final answer by regrouping. See the column-addition method for more information about regrouping the answer.

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