Everyday Mathematics

Opposite-Change Rule for Addition

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The opposite-change rule is an addition method that many people use to do mental math.

The opposite-change rule for addition involves:

- Finding a friendly number that can be added more easily mentally.

- Adjusting one addend up and the other addend down to compensate. *(Addends are the numbers added together.)*

- Adding numbers together and finding the sum (the answer to an addition problem).

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We will solve 6,837 + 5,364.

In this problem, 6,837 and 5,364 are both addends.

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$6,837$ $+3$ $6,840$

$+ \ 5,364$ -3 $+ \ 5,361$

Adjust one of the addends so that it ends with a zero.

In this case, let's adjust 6,837. First, let's add 3 to 6,837 so that we can get the digit in the ones column to be a zero. It becomes 6,840.

If we add 3 to the top addend we need to subtract 3 from the bottom addend to keep the problem in balance. So 5,364 becomes 5,361.

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$$6,837 \quad +3 \qquad 6,840 \quad +60 \qquad 6,900$$
$$+ 5,364 \quad -3 \qquad + 5,361 \quad -60 \qquad + 5,301$$

Continue to adjust the top addend so that it ends in zeros.

We need to change the 4 in the tens column into a 0. If we add 60 to 6,840, it will become 6,900.

Now we need to subtract 60 from the bottom addend. 5,361 now becomes 5,301.

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$$6{,}837 \quad {}^{+\,3} \qquad 6{,}840 \quad {}^{+\,60} \qquad 6{,}900 \quad {}^{+\,100} \qquad 7{,}000$$
$$\underline{+\ 5{,}364}\ {}^{-\,3} \qquad \underline{+\ 5{,}361}\ {}^{-\,60} \qquad \underline{+\ 5{,}301}\ {}^{-\,100} \qquad \underline{+\ 5{,}201}$$

Continue to adjust the top addend so that it ends with a zero.

We need to change the 9 in the hundreds column to a 0. If we add 100 to 6,900, it will become 7,000.

Now we need to subtract 100 from the bottom addend. 5,301 now becomes 5,201.

Everyday Mathematics

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$$6{,}837 \quad {}^{+\,3} \qquad 6{,}840 \quad {}^{+\,60} \qquad 6{,}900 \quad {}^{+\,100} \qquad 7{,}000$$

$$+\ 5{,}364 \quad {}^{-\,3} \qquad +\ 5{,}361 \quad {}^{-\,60} \qquad +\ 5{,}301 \quad {}^{-\,100} \qquad +\ 5{,}201$$

$$12{,}201$$

Now add.

Opposite-Change Rule for Addition

6,837+ 5,364 = 12,201

Note that when children use the opposite-change rule for addition, they have an opportunity to practice a variety of skills related to developing number sense and algebraic reasoning.

These skills include:

- *Using mental math strategies*
- *Using the do/undo relationship between addition and subtraction*

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