Adding Numbers
Parents' Guide

Teaching Mathematics That Makes Sense

Addition

Students often learn how to add numbers one way – by "carrying." Yet, there are many ways to think about how to add numbers.

Think about how you learned to add:

$$\begin{array}{r} 47 \\ + 35 \\ \hline \end{array}$$

You probably were taught that 7 + 5 = 12 so put down the two and "carry" the one.

$$\begin{array}{r} {\scriptstyle 1} \\ 47 \\ + 35 \\ \hline 82 \end{array}$$

Although this works it is not the only way to add numbers. In fact, often students forget to "carry" the one. We can use what are called base-10 blocks to show why we have to "carry" the one (which really stands for ten).

Modeling With Base – 10 Blocks

With base-10 blocks the ■ represents 1 and the ▌ represents 10.

$$\begin{array}{r} 47 \\ + 35 \\ \hline 82 \end{array}$$
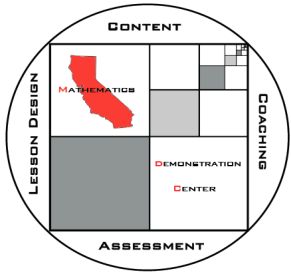
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Using Place Value: Partial Sums

Another way to add numbers is to use the place values of each number. This is called partial sums and is now shown in many textbooks.

Partial Sums (ones first)

$$
\begin{array}{r}
47 \\
+\ 35 \\
\hline
12 \leftarrow 7+5 \\
+\ 70 \leftarrow 40+30 \\
\hline
82
\end{array}
$$

Partial Sums (tens first)

$$
\begin{array}{r}
47 \\
+\ 35 \\
\hline
70 \leftarrow 40+30 \\
+\ 12 \leftarrow 7+5 \\
\hline
82
\end{array}
$$

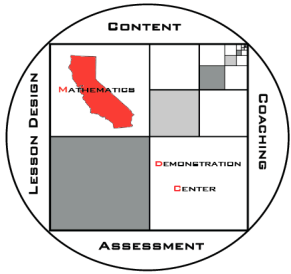## Addition by Decomposition

We can also use a concept called decomposition – where we break up the numbers and put them back together to make them easier to add. There are many ways to add numbers by decomposition.

Decomposition:

$$47 + 35$$
$$= 47 + 3 + 32$$
$$= 50 + 30 + 2$$
$$= 80 + 2$$
$$= 82$$

Decomposition by Expanded Notation:

$$47 + 35$$
$$= 40 + 7 + 30 + 5$$
$$= 40 + 30 + 7 + 5$$
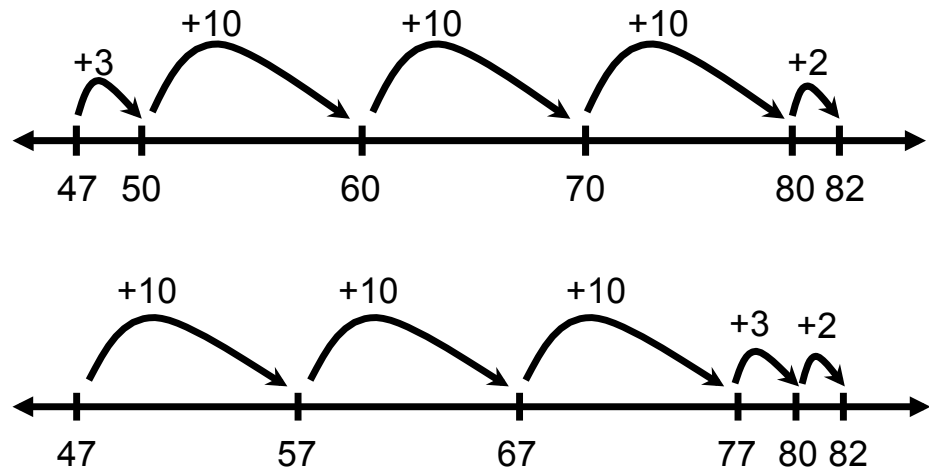$$= 70 + 7 + 3 + 2$$
$$= 70 + 10 + 2$$
$$= 82$$

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Decomposition and Using a Number Line

You can also visualize adding on a number line – and there are many ways to do this. Start at 47 and jump any way you want as long as you jump a total of 35 places.

Another Example – Three Different Ways

Using these different ways helps students better understand our number system and helps build true number sense.

$$
\begin{array}{r}
\overset{1\ 1}{366} \\
+\ 598 \\
\hline
964
\end{array}
$$

$$
\begin{array}{r}
366 \\
+\ 598 \\
\hline
800 \leftarrow 300 + 500 \\
150 \leftarrow 60 + 90 \\
+\quad 14 \leftarrow 6 + 8 \\
\hline
964
\end{array}
$$

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