Accessible Algorithms for Addition

Introduce the accessible algorithms presented below when children learn about adding with and without regrouping. Support children's use of the algorithm whenever they are working on multi-digit or decimal addition.

Show All Totals Method

Use with *Houghton Mifflin Math*, Ch 11.

This algorithm breaks an addition problem into its components. Children can use the algorithm to solve addition problems in either direction, from left to right (as they read) or right to left.

Left-to-Right	*Right-to-Left*
33	33
+ 18	+ 18
40	11
+ 11	+ 40
51	51

For less-advanced children, an optional transitional method that shows place-value meanings can be used. Children can use this method until they are ready to use the Show All Totals Method or the New Groups Below Method.

$$33 = 30 + 3$$
$$+ 18 = 10 + 8$$
$$51 = 40 + 11$$

Later in the school year, children can use the Show All Totals Method to solve multi-digit addition problems.

Left-to-Right	*Right-to-Left*
268	268
+ 124	+ 124
300	12
80	80
+ 12	+ 300
392	392

Advantages of the Accessible Algorithm

- In the traditional "ones above" algorithm, children add one to the top number, hold that number in their head, and then add on another number. This can lead to error. In the accessible algorithm, a child finds the total in the tens column and simply increases this total by one.

- Writing the "new one" below keeps the total of the ones visible as a teen number. This helps to keep the grouping process meaningful.

- Many children complain that putting a one in the tens column changes the problem, which in fact it does. The new one below does not change the problem.

Less advanced children can still use the optional transitional method until they are ready to use the Show All Totals Method or the New Groups Below Method.

$$268 = 200 + 60 + 8$$
$$+\ 124 = 100 + 20 + 4$$
$$392 = 300 + 90 + 2$$

New Groups Below Method

Use with *Houghton Mifflin Math*, Ch 4, Lessons 3, 4, 6 and 7.

This algorithm helps children see the relationship between single-digit addition and the regrouping that takes place in two-digit addition. Instead of using the common algorithm, recording the new ten above the tens digits, children learn to record the new ten below the tens digit.

Common Algorithm   *New Groups Below Method*

$$\begin{array}{r} {\scriptstyle 1} \\ 33 \\ +\ 18 \\ \hline 51 \end{array}$$ $$\begin{array}{r} 33 \\ +\ 18 \\ {\scriptstyle 1} \\ \hline 51 \end{array}$$

With this new algorithm, children can see the 11 resulting from adding 8 ones and 3 ones, and only add the new ten after having added the original tens digits.

New Groups Below with Multi-Digit Addition

Children can also use this algorithm later in the year as they work with multi-digit addition.

Common Algorithm   *New Groups Below Method*

$$\begin{array}{r} {\scriptstyle 1} \\ 268 \\ +\ 124 \\ \hline 392 \end{array}$$ $$\begin{array}{r} 268 \\ +\ 124 \\ {\scriptstyle 1} \\ \hline 392 \end{array}$$