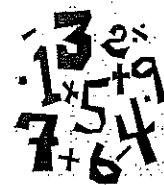


Computation Strategies



Children in fifth grade focus on multiplication and division strategies with an emphasis on counting groups, not ones. They build on the work started in third and fourth grades with an emphasis on rectangular arrays (a rectangle of unit squares whose dimensions are the factors of a multiplication problem), clusters of problems, and the relationship between multiplication and division. Computation work focuses on mastering division facts and becoming fluent in multi-digit multiplication and division algorithms.

Multi-digit Addition Strategies

Adding left to right: $346 + 518$

$$\begin{aligned}300 + 500 &= 800 \\40 + 10 &= 50 \\6 + 8 &= 14 \\800 + 50 + 14 &= 864\end{aligned}$$

Rounding and adjusting: $346 + 518$

$$\begin{aligned}350 + 510 &= 860 \\860 + 8 &= 868 \\868 - 4 &= 864\end{aligned}$$

Breaking apart one number: $346 + 518$

$$\begin{aligned}346 + 500 &= 846 \\846 + 10 &= 856 \\856 + 8 &= 864\end{aligned}$$

Changing both numbers to an equivalent problem that is easier to solve: $346 + 518$

$$\begin{aligned}346 + 518 &= (346 + 4) + (518 - 4) \\350 + 514 &= 864\end{aligned}$$

Multi-digit Subtraction Strategies

Breaking apart and subtracting: $763 - 239$

$$\begin{aligned}763 - 200 &= 563 \\563 - 30 &= 533 \\533 - 9 &= 524\end{aligned}$$

Rounding and adjusting: $763 - 239$

$$\begin{aligned}763 - 240 &= 523 \\523 + 1 &= 524\end{aligned}$$

Adding Up to subtract: $763 - 239$

$$\begin{aligned}239 + 1 &= 240 \\240 + 500 &= 740 \\740 + 23 &= 763 \\1 + 500 + 23 &= 524\end{aligned}$$

Changing both numbers to an equivalent problem that is easier to solve by adding one to both numbers: $763 - 239$

$$\begin{aligned}763 - 239 &= (763 + 1) - (239 + 1) \\764 - 240 &= 524\end{aligned}$$

Computation Strategies—continued



Multi Digit Multiplication Strategies

Breaking numbers apart: 16×12

$$10 \times 12 = 120$$

$$6 \times 12 = 72$$

$$120 + 72 = 192$$



Partial Products: 16×12

$$\begin{array}{r} 16 \\ \times 12 \\ \hline 12 \quad (2 \times 6) \\ 20 \quad (2 \times 10) \\ 60 \quad (10 \times 6) \\ \hline 100 \quad (10 \times 10) \\ 192 \end{array}$$

Breaking apart one number into landmark numbers that are easier to multiply: 58×6

$$58 \times 6 = (50 + 8) \times 6$$

$$(50 + 8) \times 6 = (50 \times 6) + (8 \times 6)$$

$$300 + 48 = 348$$

Round up and adjusting: 58×6

$$58 \times 6 = (60 \times 6) - (2 \times 6)$$

$$360 - 12 = 348$$

Rounding down and adjusting: 104×31

$$104 \times 31 = (100 \times 31) + (4 \times 31)$$

$$3100 + 124 = 3224$$

Multi Digit Division Strategies

Partial Quotients: $83 \div 6$

$$6 \overline{)83}$$

$$\underline{60} = 10 \times 6$$

23 How many more 6's in 23?

$$\underline{18} = 3 \times 6$$

5 There are 13 6's in 83 remainder 5

Big Seven Division

$$\begin{array}{r|l} 32 \overline{)837} & 20 \\ \underline{640} & \\ 197 & 5 \\ \underline{160} & \\ 37 & 1 \\ \underline{32} & \\ 5 & 26 \text{ remainder } 5 \end{array}$$

Fifth Grade Computational Fluency

Fifth grade students continue work with multiplication and division. By the end of fifth grade, students will have division facts at a level where they can easily recall them. They will be developing two efficient, accurate algorithms for multi-digit addition, subtraction, multiplication and division. Multi-digit computation work will continue in sixth grade.