

Division

Partial Quotients

Question: $550 \div 15$

Sample Solutions:

$$\begin{array}{r}
 15 \overline{)550} \\
 \underline{-150} \quad 10 \\
 400 \\
 \underline{-150} \quad 10 \\
 250 \\
 \underline{-150} \quad 10 \\
 100 \\
 \underline{-30} \quad 2 \\
 70 \\
 \underline{-30} \quad 2 \\
 40 \\
 \underline{-30} \quad 2 \\
 10 \quad \mathbf{36 \text{ r } 10}
 \end{array}$$

$$\begin{array}{r}
 15 \overline{)550} \\
 \underline{-300} \quad 20 \\
 250 \\
 \underline{-150} \quad 10 \\
 100 \\
 \underline{-75} \quad 5 \\
 25 \\
 \underline{-15} \quad 1 \\
 10 \quad \mathbf{36 \text{ r } 10}
 \end{array}$$

$$\begin{array}{r}
 15 \overline{)550} \\
 \underline{-450} \quad 30 \\
 100 \\
 \underline{-90} \quad 6 \\
 10 \quad \mathbf{36 \text{ r } 10}
 \end{array}$$

Multiplying Up

Question: $550 \div 15$

Sample Solution:

$$\begin{array}{l}
 15 \times 10 = 150 \\
 15 \times 10 = 150 \\
 15 \times 10 = 150 \\
 \left. \begin{array}{l} \\ \\ \\ \end{array} \right\} 450 \\
 \\
 15 \times 2 = 30 \quad] \quad 480 \\
 \\
 15 \times 2 = 30 \quad] \quad 510 \\
 \\
 15 \times 2 = 30 \quad] \quad 540 \\
 \\
 15 \times \mathbf{36} = 540 + 10 \\
 \mathbf{550 \div 15 = 36 \text{ r } 10}
 \end{array}$$

$$\begin{array}{l}
 15 \times 20 = 300 \\
 15 \times 10 = 150 \\
 15 \times 5 = 75 \\
 \\
 15 \times 1 = 15 \\
 15 \times \mathbf{36} = 540
 \end{array}$$

$550 \div 15 = 36 \text{ r } 10$

$$\begin{array}{l}
 15 \times 30 = 450 \\
 15 \times 6 = 90 \\
 15 \times \mathbf{36} = 540 \\
 \\
 \mathbf{550 \div 15 = 36 \text{ r } 10}
 \end{array}$$

These strategies should be discovered, explored, and modeled by the students

Multiplication

Making Landmark or Friendly Numbers

Question: 9×29

Sample Solutions:

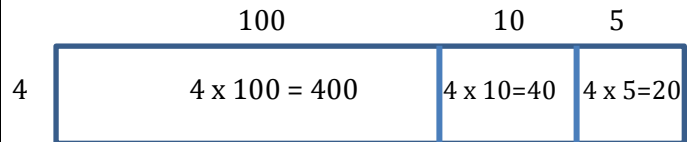
$9 \times 30 = 270$ "that's one group of 9 too much, so..."
 $270 - 9 = 261$
 Or
 $9 \times 25 = 225$ "because 8 25's is 200, so 1 more 25 is 225"
 $9 \times 2 = 18$
 $9 \times 2 = 18$ and $18 + 18 = 36$. $225 + 36 = 261$

Partial Products

Question: 4×115

Sample Solution:

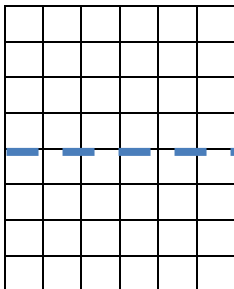
$4 \times 115 = 4 \times 100 + 4 \times 10 + 4 \times 5$
 $4 \times 100 = 400$
 $4 \times 10 = 40$
 $4 \times 5 = 20$
 $400 + 40 + 20 = 460$



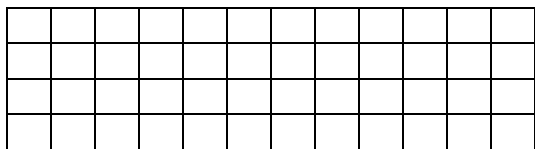
Doubling and Halving

Question: 8×6

Sample Solution: Doubling and Halving can help students relate facts that they are unsure of to facts with which they are fluent.



Cut the 8×6 array in half on the dotted line. Move the bottom section to the top right to make a 4×12 array. I know that's 48 because $4 \times 10 = 40$ and $4 \times 2 = 8$.
 $40 + 8 = 48$



Breaking Factors into Smaller Factors

Question: 8×25

Sample Solution:

$8 = 2 \times 4$
 $25 \times 4 = 100$
 $100 \times 2 = 200$, so $8 \times 25 = 200$

