

NBT.6 Multi-Digit Division

Goal: I will be able to divide 3- and 4-digit dividends by 1- and 2-divisors to find a quotient in 3 methods.

Expectations

- ① Know facts \times and \div : 0-9
- ② Use each steps to success
- ③ Must write in proper place value

4th gr. Review

① $\text{dividend} \div \text{divisor} = \text{quotient}$

$$45 \div 9 = 5$$

② $\frac{\text{quotient}}{\text{divisor}} \text{ dividend}$

$$\begin{array}{r} 51 \\ 9 \overline{) 459} \end{array}$$

divided by

← Read:
459 divided by
9 is 51
(read backwards)

③ $\frac{\text{dividend}}{\text{divisor}} = \text{quotient}$

Every fraction is a division problem.

$$\frac{45}{9} \leftarrow \text{divided by} = 5$$

This is the WRONG way to write a division problem!

$$\begin{array}{r} 45 \\ \div 9 \\ \hline 5 \end{array}$$

The entire division problem is crossed out with a large red 'X'.

Never, Ever, EVER
write a division
problem to solve like
this!

Steps to Success- Standard Algorithm Division

1. DIVIDE

- Think: Use COMPATIBLE Numbers- what number multiplied by the divisor (side number) will get me close to the dividend (inside/bottom number)?
- Write the answer to this question ABOVE the dividend

2. MULTIPLY

- Think: When I multiply the number I just wrote above times the divisor (side number), what does that equal?
- Write the answer to this question BELOW the dividend

3. SUBTRACT

- Subtract the two numbers below

4. BRING DOWN

- Only the next digit in the dividend

5. REPEAT

- Steps 1-4 with the new number created below the dividend

6. REMAINDER

- Write above next to quotient

7. CHECK

- Is my quotient in place value above dividend? ✓
- Does my answer make sense (remainder less than divisor)? ✓
- Multiply quotient by divisor and add remainder to product

$$35 \times 27 = \underline{\quad} + 8 = \underline{953}$$

Handwritten work for the division problem $27 \overline{)953}$ with a remainder of 8.

Step 1: DIVIDE
 Divisor: 27. Dividend: 953.
 Thinking: 25, 50, 75, 100, 125, 150. 25 is circled in orange. A checkmark is next to it.

Step 2: MULTIPLY

$$\begin{array}{r} 27 \\ \times 3 \\ \hline 81 \end{array}$$
 The product 81 is written in green below the first two digits of the dividend.

Step 3: SUBTRACT

$$\begin{array}{r} 27 \overline{)953} \\ \underline{-81} \\ 143 \end{array}$$
 The subtraction result 143 is written in blue below the 81.

Step 4: BRING DOWN
 The next digit, 3, is brought down to form 143. A pink arrow points down from the 3 in the dividend.

Step 5: REPEAT
 Thinking: 25, 50, 75, 100, 125, 150. 5 is circled in orange. A checkmark is next to it.

Step 6: MULTIPLY

$$\begin{array}{r} 27 \\ \times 5 \\ \hline 135 \end{array}$$
 The product 135 is written in green below the 143.

Step 7: SUBTRACT

$$\begin{array}{r} 27 \overline{)953} \\ \underline{-81} \\ 143 \\ \underline{-135} \\ 8 \end{array}$$
 The final subtraction result 8 is written in blue below the 135.

Final Answer: 35 r 8. The quotient 35 is written in orange above the dividend, and the remainder 8 is written in blue to the right.

40
40, 80, 120, ...

$$\begin{array}{r}
 175479 \\
 \hline
 37 \overline{) 175479} \\
 \underline{111} \\
 647 \\
 \underline{555} \\
 927 \\
 \underline{658} \\
 269
 \end{array}$$

r 4

$$\begin{array}{r}
 4 \\
 37 \\
 \times 7 \\
 \hline
 259
 \end{array}$$

$$\begin{array}{r}
 37 \\
 \underline{- 27} \\
 10
 \end{array}$$

$$\begin{array}{r}
 2 \\
 37 \\
 \times 4 \\
 \hline
 148
 \end{array}$$

$$\begin{array}{r}
 3 \\
 37 \\
 \times 5 \\
 \hline
 185
 \end{array}$$

$$\begin{array}{r}
 189 \\
 \underline{- 185} \\
 4
 \end{array}$$

Should know 12's fact so no compatib

$$\begin{array}{r}
 \overline{) 43260} \\
 \underline{- 36} \\
 72 \\
 \underline{- 72} \\
 0 \\
 6 \\
 0
 \end{array}$$

The diagram shows a long division problem: 12 divides 43260. The quotient is 360. The remainder is 6. The numbers 3, 6, and 0 in the quotient are colored orange, yellow, and blue respectively. The numbers 3 and 6 in the remainder are colored green and pink respectively. The number 0 in the remainder is colored blue. There are blue annotations: a '3' above the first 3 in the dividend, a '3' above the second 3 in the dividend, and a '10' below the second 3 in the dividend. A red 'x' is above the first 3 in the dividend. A red arc is under the 43 in the dividend. A blue arc is under the 36 in the dividend. A blue arc is under the 72 in the dividend. A blue arc is under the 0 in the remainder. A blue arc is under the 0 in the remainder. A blue arc is under the 0 in the remainder. A blue arc is under the 0 in the remainder.

r 6

because $12 \times ? \neq 6$
 must hold quotient
 place value with
 a zero