

Lesson 13: Dividing Multi-Digit Numbers Using the Algorithm

Classwork

Example 1

Divide $70,072 \div 19$.

- a. Estimate:

$$70,000 \div 20$$

$$70,000 \div 10 \div 2$$

$$7,000 \div 2 = 3,500$$

- b. Create a table to show the multiples of 19.

Multiples of 19
$1 \times 19 = 19$
$2 \times 19 = 38$
$3 \times 19 = 57$
$4 \times 19 = 76$
$5 \times 19 = 95$
$6 \times 19 = 114$
$7 \times 19 = 133$
$8 \times 19 = 152$
$9 \times 19 = 171$

- c. Use the algorithm to divide $70,072 \div 19$. Check your work.

$$\begin{array}{r}
 3688 \\
 19 \overline{) 70072} \\
 \underline{57} \\
 130 \\
 \underline{-114} \\
 167 \\
 \underline{-152} \\
 152 \\
 \underline{-152} \\
 0
 \end{array}$$

*. ✓ WORK

$$\begin{array}{r}
 3,688 \\
 \times 19 \\
 \hline
 70,072
 \end{array}$$

Example 2

Divide $14,175 \div 315$.

- a. Estimate:

$$15,000 \div 300$$

$$15,000 \div 100 \div 3$$

$$150 \div 3 = 50$$

$$50 \times 315 = 15,750 \text{ (Too large)}$$

- b. Use the algorithm to divide $14,175 \div 315$. Check your work.

$$\begin{array}{r}
 45 \\
 315 \overline{) 14175} \\
 \underline{-1260} \\
 1575 \\
 \underline{-1575} \\
 0
 \end{array}$$

$$\begin{array}{r}
 \checkmark \text{ WORK: } 315 \\
 \times 45 \\
 \hline
 14,175
 \end{array}$$

Exercises 1–5

For each exercise,

- Estimate.
- Divide using the algorithm, explaining your work using place value.

1. $484,692 \div 78$

- Estimate: $480,000 \div 80 = 6,000$

$$\begin{array}{r}
 6214 \\
 78 \overline{) 484692} \\
 \underline{-408} \downarrow \\
 166 \\
 \underline{-156} \downarrow \\
 109 \\
 \underline{-78} \downarrow \\
 312 \\
 \underline{-312} \\
 0
 \end{array}$$

$$\begin{array}{r}
 \checkmark: 6214 \\
 \times 78 \\
 \hline
 484,692
 \end{array}$$

2. $281,886 \div 33$

- Estimate:

$$270,000 \div 30 = 9,000$$

$$\begin{array}{r}
 8542 \\
 33 \overline{) 281886} \\
 \underline{-264} \downarrow \\
 178 \\
 \underline{-165} \downarrow \\
 138 \\
 \underline{-132} \downarrow \\
 66
 \end{array}$$

$$\begin{array}{r}
 \checkmark: 8542 \\
 \times 33 \\
 \hline
 281,886
 \end{array}$$

3. $2,295,517 \div 37$

a. Estimate: $2,400,000 \div 40 = 60,000$

$$\begin{array}{r}
 62041 \\
 37 \overline{) 2295517} \\
 \underline{-222} \\
 75 \\
 \underline{-74} \\
 151 \\
 \underline{-148} \\
 37 \\
 \underline{-37} \\
 0
 \end{array}$$

$$\begin{array}{r}
 \checkmark: 62041 \\
 \times 37 \\
 \hline
 2,295,517
 \end{array}$$

4. $952,448 \div 112$

a. Estimate: $1,000,000 \div 100 = 10,000$

$$\begin{array}{r}
 8504 \\
 112 \overline{) 952,448} \\
 \underline{-896} \\
 544 \\
 \underline{-560} \\
 448 \\
 \underline{-448} \\
 0
 \end{array}$$

$$\begin{array}{r}
 \checkmark: 8504 \\
 \times 112 \\
 \hline
 952,448
 \end{array}$$

5. $1,823,535 \div 245$

a. Estimate: $1,800,000 \div 200 = 9,000$

$$\begin{array}{r}
 7443 \\
 \hline
 245 \overline{) 1,823,535} \\
 \underline{1715} \downarrow \\
 1075 \\
 \underline{-980} \downarrow \\
 1053 \\
 \underline{-980} \downarrow \\
 735 \\
 \underline{-735} \\
 0
 \end{array}$$

$$\begin{array}{r}
 \checkmark: 7443 \\
 \times 245 \\
 \hline
 1,823,535
 \end{array}$$