Common Core State Standard:
6.NS.2

Divide Whole Numbers

Getting the Idea

In division, the number that is divided is the **dividend**. The number that divides the dividend is the **divisor**. The answer to a division problem is the **quotient**. Some division problems will have a remainder. A **remainder** is a counting number that is left over when two counting numbers are divided. A remainder is always less than the divisor.

To divide by a 2-digit number, you may need to estimate first to help you find the quotient.

Example 1

What is 64,015 ÷ 74?

Strategy **Estimate the first digit in the quotient and work from there.**

Step 1 Decide where to place the first digit in the quotient.

$74\overline{)64{,}015}$

The first digit of the quotient will be in the hundreds place.

Step 2 Divide 640 by 74.

You know that $8 \times 70 = 560$ and $9 \times 70 = 630$, so try 8 first.

$$\begin{array}{r} 8 \\ 74\overline{)64{,}015} \\ -59\,2 \\ \hline 4\,8 \end{array}$$

← Multiply: $8 \times 74 = 592$

← Subtract: $640 - 592 = 48$

Step 3 Bring down the 1 and divide.

You know that $6 \times 70 = 420$, so try 6.

$$\begin{array}{r} 86 \\ 74\overline{)64{,}015} \\ -59\,2 \\ \hline 4\,81 \\ -4\,44 \\ \hline 37 \end{array}$$

← Multiply: $6 \times 74 = 444$

← Subtract: $481 - 444 = 37$

Step 4 Bring down the 5 and divide.

You know that $5 \times 70 = 350$, so try 5.

$$\begin{array}{r} 865 \\ 74\overline{)64{,}015} \\ -59\,2 \\ \hline 4\,81 \\ -4\,44 \\ \hline 375 \\ -370 \\ \hline 5 \end{array}$$

← Multiply: $5 \times 74 = 370$

← Subtract: $375 - 370 = 5$

The remainder is 5.

Solution **64,015 ÷ 74 = 865 R5**

Example 2

There are 1,288 seats in an auditorium. Each of the 23 rows in the auditorium has the same number of seats. How many seats are in each row?

Strategy **Divide to find the solution.**

Step 1 Decide where to place the first digit in the quotient.

$$23\overline{)1{,}288}$$

The first digit of the quotient will be in the tens place.

Step 2 Divide 128 by 23.

$$\begin{array}{r} 5 \\ 23\overline{)1{,}288} \\ -1\,15 \\ \hline 13 \end{array}$$

← Multiply: $5 \times 23 = 115$

← Subtract: $128 - 115 = 13$

Step 3 Bring down the 8 and divide.

$$\begin{array}{r} 56 \\ 23\overline{)1{,}288} \\ -1\,15 \\ \hline 138 \\ -138 \\ \hline 0 \end{array}$$

← Multiply: $6 \times 23 = 138$

← Subtract: $138 - 138 = 0$

Solution **There are 56 seats in each row of the auditorium.**

Example 3

Mindy's annual salary as a physical therapist is $59,796. How much does Mindy earn per month?

Strategy **Divide each place, going from left to right.**

Step 1 There are 12 months in a year, so the divisor is 12.

$12\overline{)59{,}796}$

The first digit of the quotient will be in the thousands place.

Step 2 Divide 59 by 12.

$$\begin{array}{r} 4 \\ 12\overline{)59{,}796} \\ -48 \\ \hline 11 \end{array} \quad \begin{array}{l} \\ \\ \leftarrow \text{Multiply: } 4 \times 12 = 48 \\ \leftarrow \text{Subtract: } 59 - 48 = 11 \end{array}$$

Step 3 Bring down the 7. Divide.

$$\begin{array}{r} 4\,9 \\ 12\overline{)59{,}796} \\ -48 \\ \hline 11\,7 \\ -10\,8 \\ \hline 9 \end{array} \quad \begin{array}{l} \\ \\ \\ \\ \leftarrow \text{Multiply: } 9 \times 12 = 108 \\ \leftarrow \text{Subtract: } 117 - 108 = 9 \end{array}$$

Step 4 Bring down the 9. Divide.

$$\begin{array}{r} 4\,98 \\ 12\overline{)59{,}796} \\ -48 \\ \hline 11\,7 \\ -10\,8 \\ \hline 99 \\ -96 \\ \hline 3 \end{array} \quad \begin{array}{l} \\ \\ \\ \\ \\ \\ \leftarrow \text{Multiply: } 8 \times 12 = 96 \\ \leftarrow \text{Subtract: } 99 - 96 = 3 \end{array}$$

Step 5 Bring down the 6. Divide.

```
    4 983
12)59,796
 −48
  11 7
 −10 8
     99
    −96
     36
    −36      ← Multiply: 3 × 12 = 36
      0      ← Subtract: 36 − 36 = 0
```

Solution **Mindy earns $4,983 per month.**

Coached Example

Divide: 32)89,824

```
    2 _ 0 _
32)8 9,8 2 4
 −6 4          ← Multiply: 2 × 32 = ____
   __ 8
 − ____        ← Multiply: ____ × 32 = ____
     2 2
   −   0       ← Multiply: ____ × 32 = ____
     _ _ 4
   −_ _ _      ← Multiply: ____ × 32 = ____
       0
```

Check your answer. Multiply the quotient and the divisor.

_____ × 32 = _____

89,824 ÷ 32 = _____