

# Dividing Numbers that Result in a Decimal

Let's find quotients that are not whole numbers.

**19.1**

## Math Talk: Dividing by 4

Find the value of each quotient mentally.

- $80 \div 4$
- $12 \div 4$
- $1.2 \div 4$
- $81.2 \div 4$



## 19.2 Whole Numbers No More

Here is how Lin calculated  $62 \div 5$ .

$$5 \overline{)6 \ 2}$$

$$5 \overline{)6 \ 2}$$

1

— 5

1 2

— 1 0

2

$$5 \overline{)6 \ 2 \ . \ 0}$$

1 2.

— 5

1 2

— 1 0

2 0

$$5 \overline{)6 \ 2 \ . \ 0}$$

1 2 . 4

— 5

1 2

— 1 0

2 0

— 2 0

0

1. Discuss with your partner:

- In the third step, Lin drew a vertical dashed line to the right of the 2 in 62. What do you think that line is for?
- She also wrote a point and a 0 to the right of 62. Then she put a 0 after the remainder of 2. What do you think the zeros are for?
- Lin subtracted 5 groups of 4 from 20. What value does the 4 in the quotient represent?
- What value did Lin find for  $62 \div 5$ ?

2. Use long division to find the value of each expression. Then pause so your teacher can review your work.

- $126 \div 8$
- $90 \div 12$



3. Use long division to show that:

$5 \div 4$ , or  $\frac{5}{4}$ , is 1.25.

$4 \div 5$ , or  $\frac{4}{5}$ , is 0.8.

$1 \div 8$ , or  $\frac{1}{8}$ , is 0.125.



### Are you ready for more?

Noah said we cannot use long division to calculate  $10 \div 3$  because there will always be a remainder.

1. What do you think Noah meant by “there will always be a remainder”? Explain your reasoning.
2. What do you think is the value of  $10 \div 3$ ?



## 19.3

## Using Long Division to Divide Decimals

Use long division to answer each question.

1. What is the value of  $53.8 \div 4$ ?
2. Five students raised \$77.40 for a charity. If everyone raised the same amount, how much money did each student raise?

### Lesson 19 Summary

We can use long division to find quotients even when the numbers involved are not whole numbers. Here is the long-division calculation of  $86 \div 4$ , which results in a decimal quotient.

$$\begin{array}{r}
 & 2 & 1 & . & 5 \\
 4 & \overline{)8 & 6} \\
 & -8 \\
 \hline
 & 6 \\
 & -4 \\
 \hline
 & 2 & 0 \\
 & -2 & 0 \\
 \hline
 & 0
 \end{array}$$

The calculation shows that, after removing 4 groups of 21, there are 2 ones remaining. We can continue dividing by writing a 0 to the right of the 2 and thinking of that remainder as 20 tenths, which can then be divided into 4 groups.

To show that the quotient we are working with now is in the tenths place, we put a decimal point to the right of the 1 (which is in the ones place) at the top. It may also be helpful to draw a vertical line to separate the ones and the tenths.

There are 4 groups of 5 tenths in 20 tenths, so we write 5 in the tenths place at the top. The calculation likewise shows  $86 \div 4 = 21.5$ .

