

**North Penn School District**  
**Elementary Math Parent Letter**

**Grade 5**

**Unit 2 – Chapter 5: Divide Decimals**

Examples for each lesson:

**Lesson 5.1**

**Algebra • Division Patterns  
with Decimals**

To divide a number by 10, 100, or 1,000, use the number of zeros in the divisor to determine how the position of the decimal point changes in the quotient.

	Number of zeros:	Move decimal point:
$147 \div 1 = \underline{147}$	0	0 places to the left
$147 \div 10 = \underline{14.7}$	1	1 place to the left
$147 \div 100 = \underline{1.47}$	2	2 places to the left
$147 \div 1,000 = \underline{0.147}$	3	3 places to the left

To divide a number by a power of 10, you can use the exponent to determine how the position of the decimal point changes in the quotient.

	Exponent	Move decimal point:
$97.2 \div 10^0 = \underline{97.2}$	0	0 places to the left
$97.2 \div 10^1 = \underline{9.72}$	1	1 place to the left
$97.2 \div 10^2 = \underline{0.972}$	2	2 places to the left

More information on this strategy is available on Animated Math Model #20.

## Lesson 5.2

### Divide Decimals by Whole Numbers

You can draw a quick picture to help you divide a decimal by a whole number.

In a decimal model, each large square represents one, or 1. Each bar represents one-tenth, or 0.1.

**Divide.**  $1.2 \div 3$

**Step 1** Draw a quick picture to represent the dividend, 1.2.



**Step 2** Draw 3 circles to represent the divisor, 3.



**Step 3** You cannot evenly divide 1 into 3 groups. Regroup 1 as 10 tenths. There are 12 tenths in 1.2.



**Step 4** Share the tenths equally among 3 groups.



Each group contains 0 ones and 4 tenths.

So,  $1.2 \div 3 = \underline{0.4}$ .

## Lesson 5.3

### Estimate Quotients

You can use multiples and compatible numbers to estimate decimal quotients.

**Estimate.**  $249.7 \div 31$

**Step 1** Round the divisor, 31, to the nearest 10.

31 rounded to the nearest 10 is 30.

**Step 2** Find the multiples of 30 that the dividend, 249.7, is between.

249.7 is between 240 and 270.

**Step 3** Divide each multiple by the rounded divisor, 30.

$240 \div 30 = \underline{8}$       $270 \div 30 = \underline{9}$

So, two possible estimates are 8 and 9.

## Lesson 5.4

### Division of Decimals by Whole Numbers

**Divide.**  $19.61 \div 37$

**Step 1** Estimate the quotient.

$2,000 \text{ hundredths} \div 40 = \underline{50}$  hundredths, or 0.50.  
So, the quotient will have a zero in the ones place.

$$\begin{array}{r} 0 \\ 37 \overline{)19.61} \end{array}$$

**Step 2** Divide the tenths.

Use the estimate. Try 5 in the tenths place.

Multiply.  $\underline{5} \times 37 = \underline{185}$

Subtract.  $196 - \underline{185} = \underline{11}$

Check.  $\underline{11} < 37$

$$\begin{array}{r} 0.5 \\ 37 \overline{)19.61} \\ - 185 \\ \hline 11 \end{array}$$

**Step 3** Divide the hundredths.

Estimate:  $120 \text{ hundredths} \div 40 = 3 \text{ hundredths}$ .

Multiply.  $\underline{3} \times 37 = \underline{111}$

Subtract.  $\underline{111} - \underline{111} = \underline{0}$

Check.  $\underline{0} < 37$

$$\begin{array}{r} 0.53 \\ 37 \overline{)19.61} \\ - 185 \\ \hline 111 \\ - 111 \\ \hline 0 \end{array}$$

Place the decimal point in the quotient.

So,  $19.61 \div 37 = \underline{0.53}$ .

More information on this strategy is available on Animated Math Model #20.

## Lesson 5.5

### Decimal Division

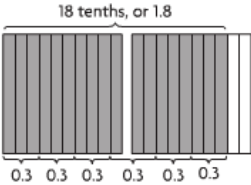
**You can use decimal models to divide tenths.**

**Divide.**  $1.8 \div 0.3$ .

**Step 1** Shade 18 tenths to represent the dividend, 1.8.

**Step 2** Divide the 18 tenths into groups of 3 tenths to represent the divisor, 0.3.

**Step 3** Count the groups. There are 6 groups of 0.3 in 1.8. So,  $1.8 \div 0.3 = \underline{6}$ .



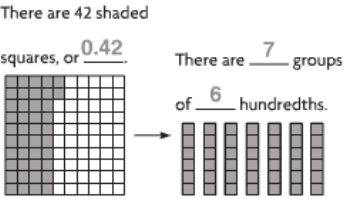
**You can use decimal models to divide hundredths.**

**Divide.**  $0.42 \div 0.06$

**Step 1** Shade 42 squares to represent the dividend, 0.42.

**Step 2** Divide the 42 small squares into groups of 6 hundredths to represent the divisor, 0.06.

**Step 3** Count the groups. There are 7 groups of 0.06 in 0.42. So,  $0.42 \div 0.06 = \underline{7}$ .



## Lesson 5.6

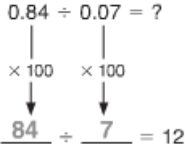
### Divide Decimals

You can multiply the dividend and the divisor by the same power of 10 to make the divisor a whole number. As long as you multiply both the dividend and the divisor by the same power of 10, the quotient stays the same.

**Example 1: Divide.**  $0.84 \div 0.07$

Multiply the dividend, 0.84, and the divisor, 0.07, by the power of 10 that makes the divisor a whole number.

Since  $84 \div 7 = 12$ , you know that  $0.84 \div 0.07 = \underline{12}$ .

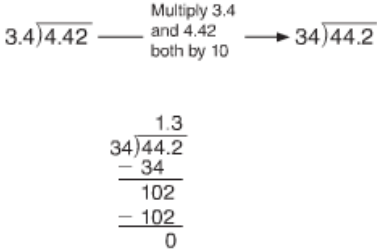


**Example 2: Divide.**  $4.42 \div 3.4$

Multiply both the dividend and the divisor by 10 to make the divisor a whole number.

Divide as you would whole numbers. Place the decimal point in the quotient, above the decimal point in the dividend.

So,  $4.42 \div 3.4 = \underline{1.3}$



## Lesson 5.7

### Write Zeros in the Dividend

When there are not enough digits in the dividend to complete the division, you can write zeros to the right of the last digit in the dividend. Writing zeros will not change the value of the dividend or the quotient.

**Divide.**  $5.2 \div 8$

**Step 1** Divide as you would whole numbers. Place the decimal point in the quotient above the decimal point in the dividend.

$$\begin{array}{r} 0.6 \\ 8 \overline{)5.2} \\ \underline{-48} \\ 4 \end{array}$$

The decimal point in the quotient is directly above the decimal point in the dividend.

**Step 2** The difference is less than the divisor. Write a 0 in the dividend and continue to divide.

$$\begin{array}{r} 0.65 \\ 8 \overline{)5.20} \\ \underline{-48} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

The difference, 4, is less than the divisor.

Write a 0 in the dividend. Then continue to divide.

So,  $5.2 \div 8 = \underline{0.65}$

More information on this strategy is available on Animated Math Model #21.

## Lesson 5.8

# Problem Solving • Decimal Operations

Rebecca spent \$32.55 for a photo album and three identical candles. The photo album cost \$17.50 and the sales tax was \$1.55. How much did each candle cost?

Read the Problem		
What do I need to find?	What information do I need to use?	How will I use the information?
I need to find the cost of each candle.	Rebecca spent <u>\$32.55</u> for a photo album and <u>3</u> candles. The photo album cost <u>\$17.50</u> . The sales tax was <u>\$1.55</u> .	I can <u>use a flowchart and work backward from the total amount Rebecca spent to find the cost of each candle.</u>
Solve the Problem		
• Make a flowchart to show the information. Then work backward to solve.		
<p>Cost of 3 candles plus Cost of photo album plus Sales tax equals Total spent <math>3 \times \text{cost of each candle} + \\$17.50 + \\$1.55 = \\$32.55</math></p>		
<p>Total spent minus Sales tax minus Cost of photo album equals Cost of 3 candles <math>\\$32.55 - \\$1.55 - \\$17.50 = \\$13.50</math></p>		
• Divide the cost of 3 candles by 3 to find the cost of each candle. $\$13.50 \div 3 = \$4.50$ So, each candle cost \$4.50.		

## Vocabulary

**Compatible numbers** – numbers that are easy to compute with mentally

**Decimal** – a number with one or more digits to the right of the decimal point

**Decimal point** – a symbol used to separate the ones place from the tenths place in decimal numbers

**Dividend** – the number that is to be divided in a division problem

**Division** – the process of sharing a number of items to find how many equal groups can be made or how many items will be in each equal group; the opposite operation of multiplication

**Divisor** – the number that divides the dividend

**Estimate** – a number that is close to an exact amount

**Hundredth** – one of one hundred equal parts

**Tenth** – one of ten equal parts