Name _____

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:
$147 \div 1 =$ 147	0	0 places to the left
$147 \div 10 =$ 14.7	1	1 place to the left
$147 \div 100 =$ 1.47	2	2 places to the left
$147 \div 1{,}000 =$ 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:
$97.2 \div 10^0 =$ 97.2	0	0 places to the left
$97.2 \div 10^1 =$ 9.72	1	1 place to the left
$97.2 \div 10^2 =$ 0.972	2	2 places to the left

Complete the pattern.

1. $358 \div 10^0 =$ _____

$358 \div 10^1 =$ _____

$358 \div 10^2 =$ _____

$358 \div 10^3 =$ _____

2. $102 \div 10^0 =$ _____

$102 \div 10^1 =$ _____

$102 \div 10^2 =$ _____

$102 \div 10^3 =$ _____

3. $99.5 \div 1 =$ _____

$99.5 \div 10 =$ _____

$99.5 \div 100 =$ _____

Name _____

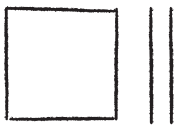
Divide Decimals by Whole Numbers

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

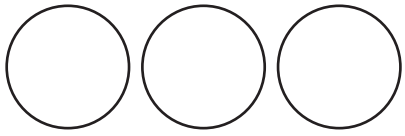
In a decimal model, each large square represents one, or 1. Each bar represents one-tenth, or 0.1.

Divide. 1.2 ÷ 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.

So, 1.2 ÷ 3 = 0.4.

Step 4 Share the tenths equally among 3 groups.

Each group contains 0 ones and 4 tenths.

Divide. Draw a quick picture.

1. 2.7 ÷ 9 = _____

2. 4.8 ÷ 8 = _____

3. 2.8 ÷ 7 = _____

4. 7.25 ÷ 5 = _____

5. 3.78 ÷ 3 = _____

6. 8.52 ÷ 4 = _____

Name _____

Estimate Quotients

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

Estimate. 249.7 ÷ 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 ÷ 30 = 8 270 ÷ 30 = 9

So, two possible estimates are 8 and 9.

Use compatible numbers to estimate the quotient.

1. 23.6 ÷ 7

_____ ÷ _____ = _____

2. 469.4 ÷ 62

_____ ÷ _____ = _____

Estimate the quotient.

3. 338.7 ÷ 49

4. 75.1 ÷ 9

5. 674.8 ÷ 23

6. 61.9 ÷ 7

7. 96.5 ÷ 19

8. 57.2 ÷ 8

Name _____

Division of Decimals by Whole Numbers

Divide. 19.61 ÷ 37

Step 1 Estimate the quotient.
2,000 hundredths ÷ 40 = 50 hundredths, or 0.50.
So, the quotient will have a zero in the ones place.

$$37\overline{)19.61}\quad 0$$

Step 2 Divide the tenths.
Use the estimate. Try 5 in the tenths place.

Multiply. 5 × 37 = 185

Subtract. 196 − 185 = 11

Check. 11 < 37

$$37\overline{)19.61}\quad 0\,5$$
$$-\,18\,5$$
$$1\,1$$

Step 3 Divide the hundredths.
Estimate: 120 hundredths ÷ 40 = 3 hundredths.

Multiply. 3 × 37 = 111

Subtract. 111 − 111 = 0

Check. 0 < 37

Place the decimal point in the quotient.

So, 19.61 ÷ 37 = 0.53.

$$37\overline{)19.61}\quad 0.53$$
$$-\,18\,5$$
$$1\,11$$
$$-\,1\,11$$
$$0$$

Write the quotient with the decimal point placed correctly.

1. 5.94 ÷ 3 = 198 _____

2. 48.3 ÷ 23 = 21 _____

Divide.

3. $9\overline{)61.2}$

4. $17\overline{)83.3}$

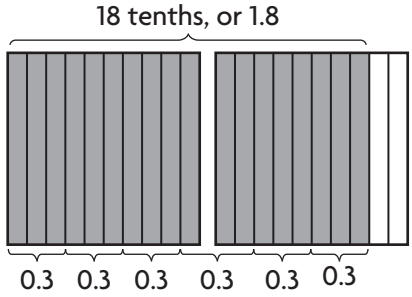
5. $9\overline{)7.38}$

Name _____

Decimal Division

You can use decimal models to divide tenths.

Divide. 1.8 ÷ 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 ÷ 0.3 = 6.

You can use decimal models to divide hundredths.

Divide. 0.42 ÷ 0.06

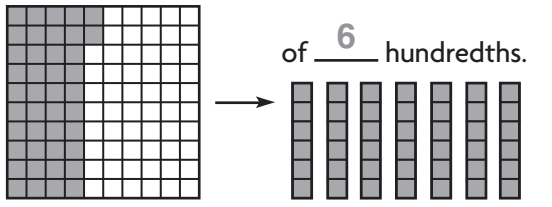
Step 1 Shade 42 squares to represent the dividend, 0.42.

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 ÷ 0.06 = 7.

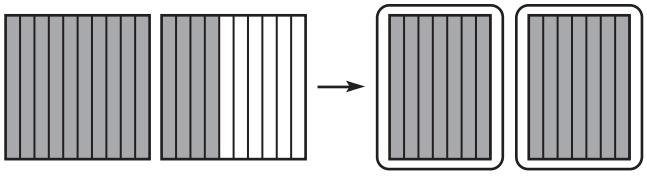
There are 42 shaded squares, or 0.42.



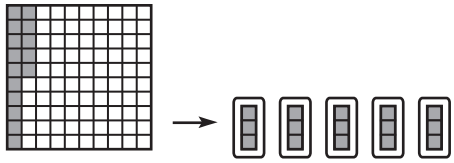
There are 7 groups of 6 hundredths.

Use the model to complete the number sentence.

1. 1.4 ÷ 0.7 = _____



2. 0.15 ÷ 0.03 = _____



Divide. Use decimal models.

3. 2.7 ÷ 0.3 = _____

4. 0.52 ÷ 0.26 = _____

5. 0.96 ÷ 0.16 = _____

Name _____

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 ÷ 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 ÷ 7 = 12, you know that 0.84 ÷ 0.07 = 12.

0.84 ÷ 0.07 = ?
× 100 × 100
84 ÷ 7 = 12

Example 2: Divide. 4.42 ÷ 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 ÷ 3.4 = 1.3.

3.4)4.42 — Multiply 3.4 and 4.42 both by 10 → 34)44.2

```
   1.3
34)44.2
 − 34
  102
 − 102
    0
```

Copy and complete the pattern.

1. 54 ÷ 6 = _____
5.4 ÷ _____ = 9
_____ ÷ 0.06 = 9

2. 184 ÷ 23 = _____
18.4 ÷ _____ = 8
_____ ÷ 0.23 = 8

3. 138 ÷ 2 = _____
13.8 ÷ _____ = 69
_____ ÷ 0.02 = 69

Divide.

4. 1.4)9.8

5. 0.3)0.6

6. 3.64 ÷ 1.3

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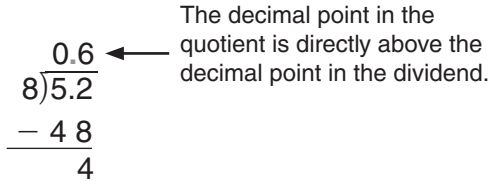
Write Zeros in the Dividend

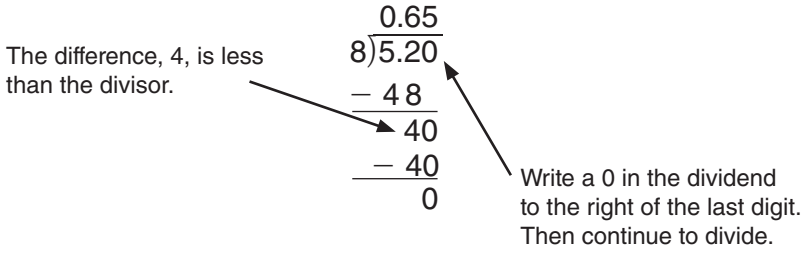
When there are not enough digits in the dividend to complete the division, you can write zeros to the right of the last digit in a decimal number in the dividend. Writing zeros to the right of the last digit will not change the value of the dividend or the quotient.

Divide. 5.2 ÷ 8

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



Step 2 The difference is less than the divisor. Write a 0 in the dividend to the right of the last digit and continue to divide.



So, 5.2 ÷ 8 = 0.65.

Write the quotient with the decimal point placed correctly.

1. 3 ÷ 0.4 = 75 **2.** 25.2 ÷ 8 = 315 **3.** 60 ÷ 25 = 24 **4.** 8.28 ÷ 0.72 = 115

Divide.

5. $6\overline{)43.5}$ **6.** $1.4\overline{)7.7}$ **7.** $30\overline{)72}$ **8.** $0.18\overline{)0.63}$

Problem Solving • Decimal Operations

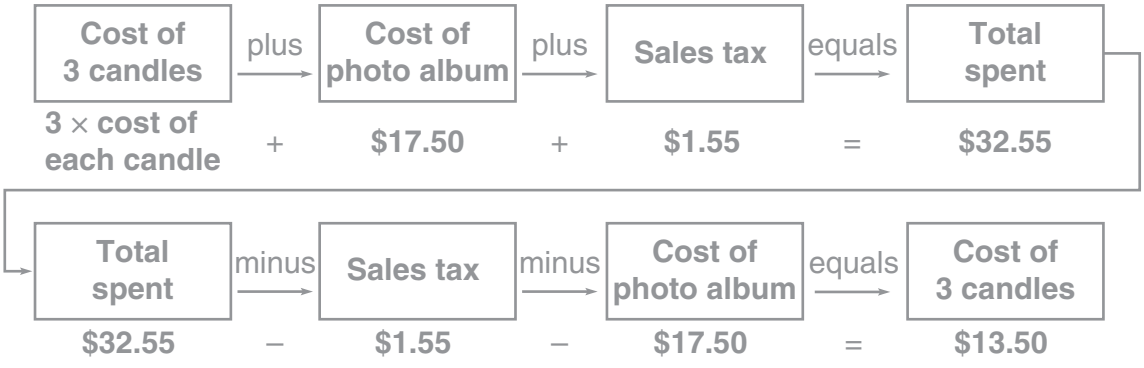
Rebecca spent $32.55 for a photo album and three identical candles. The photo album cost $17.50 and the sales tax was $1.55. How much did each candle cost?

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 $32.55 for a photo album and 3 candles. The photo album cost $17.50. The sales tax was $1.55.	I can use a flowchart and work backward from the total amount Rebecca spent to find the cost of each candle.

Solve the Problem

- Make a flowchart to show the information. Then work backward to solve.



- Divide the cost of 3 candles by 3 to find the cost of each candle.

  $13.50 ÷ 3 = $4.50

  So, each candle cost $4.50.

Use a flowchart to help you solve the problem.

1. Maria spent $28.69 on one pair of jeans and two T-shirts. The jeans cost $16.49. Each T-shirt cost the same amount. The sales tax was $1.62. How much did each T-shirt cost?

2. At the skating rink, Sean and Patrick spent $17.45 on admission and snacks. They used one coupon for $2 off the admission. The snacks cost $5.95. What is the regular admission cost for one?