Lesson 1-5
Dividing Decimals

Learning Targets:

- Divide decimals by whole numbers.
- Divide whole numbers and decimals by decimals.
- Estimate quotients.
- Solve real-world problems by dividing decimals.

Example A

Thirty-two chemistry students raised $272.64 to purchase a precision electronic balance for their laboratory. What was the average amount of money raised per student?

Step 1: Estimate the quotient.
Use compatible numbers. 272.64 is about 300, and 32 is about 30.
$300 \div 30 = 10$. So, $10 is a good estimate of the quotient.

Step 2: Use the algorithm for dividing whole numbers.

$$
\begin{array}{r}
8.52 \\
32\overline{)\ 272.64} \\
-256 \\
\hline
166 \\
-160 \\
\hline
64 \\
-\ 64 \\
\hline
0
\end{array}
$$

Solution: The average amount raised per student was $8.52. The answer is reasonable because it is close to the estimate of $10.

Learning Target:
I can divide decimals by whole numbers.

Example A

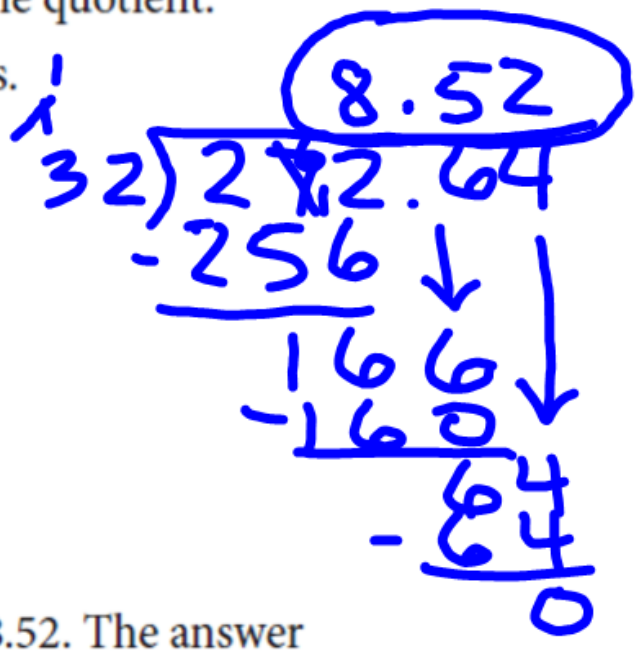
Learning Target:
I can divide decimals by whole numbers.

Thirty-two chemistry students raised $272.64 to purchase a precision electronic balance for their laboratory. What was the average amount of money raised per student?

Step 1: Estimate the quotient.
Use compatible numbers. 272.64 is about 300, and 32 is about 30.
$300 \div 30 = 10$. So, $10 is a good estimate of the quotient.

Step 2: Use the algorithm for dividing whole numbers.

$$
\begin{array}{r}
8.52 \\
32\overline{)\ 272.64} \\
-256 \\
\hline
166 \\
-160 \\
\hline
64 \\
-\ 64 \\
\hline
0
\end{array}
$$



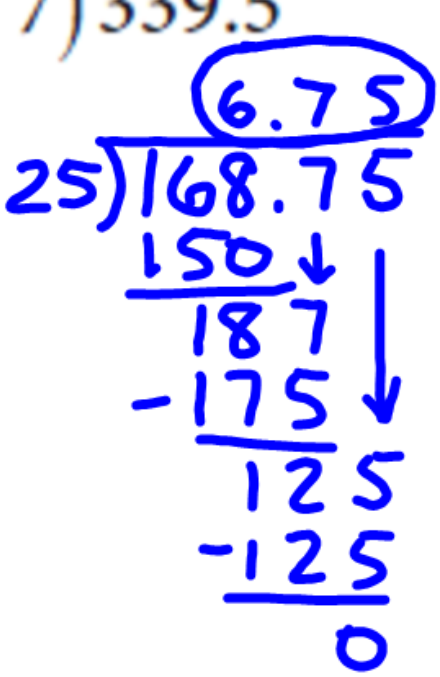
Solution: The average amount raised per student was $8.52. The answer is reasonable because it is close to the estimate of $10.

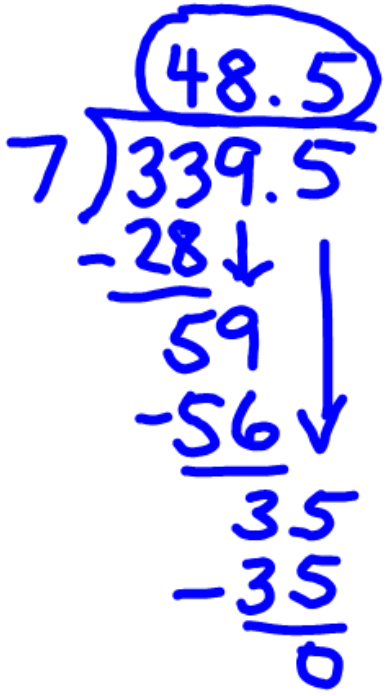
Try These A

Estimate each quotient. Then find the quotient.

a. $25\overline{)168.75}$ Quotient: _____

b. $7\overline{)339.5}$ Quotient: _____





All of the division problems you have solved so far have had whole numbers as divisors. When the divisor is not a whole number, it has to be multiplied by 10, 100, 1,000, or some higher power of 10 to create a whole number. Both the divisor and the dividend have to be multiplied by the same number so that the value of the quotient is not affected. This can be done by moving the decimal points of the dividend and divisor an equal number of spaces to the right.

$3.856 \div 0.16 = 385.6 \div 16$

The decimal in the second number moves 2 places right, so the decimal in the first number must move 2 places right also. ($0.16 \times 100 = 16$)

All of the division problems you have solved so far have had whole numbers as divisors. When the divisor is not a whole number, it has to be multiplied by 10, 100, 1,000, or some higher power of 10 to create a whole number. Both the divisor and the dividend have to be multiplied by the same number so that the value of the quotient is not affected. This can be done by moving the decimal points of the dividend and divisor an equal number of spaces to the right.

$32.8\overline{)240.0} = 328\overline{)2400}$ (×10)

All of the division problems you have solved so far have had whole numbers as divisors. When the divisor is not a whole number, it has to be multiplied by 10, 100, 1,000, or some higher power of 10 to create a whole number. Both the divisor and the dividend have to be multiplied by the same number so that the value of the quotient is not affected. This can be done by moving the decimal points of the dividend and divisor an equal number of spaces to the right.

$51.25 \div 8.3 = 5125 \div 830$

All of the division problems you have solved so far have had whole numbers as divisors. When the divisor is not a whole number, it has to be multiplied by 10, 100, 1,000, or some higher power of 10 to create a whole number. Both the divisor and the dividend have to be multiplied by the same number so that the value of the quotient is not affected. This can be done by moving the decimal points of the dividend and divisor an equal number of spaces to the right.

×100

$3.854 \div 0.21 = 385.4 \div 21$

Example B

Find the quotient $103.5 \div 0.45$.

Step 1: Estimate the quotient.
Use compatible numbers. 103.5 is about 100; 0.45 is about 0.5. $100 \div 0.5 = 200$. So, 200 is a good estimate of the quotient.

Step 2: Think: I can rewrite 0.45 as a whole number by multiplying it by 100. I'll do the same thing to the dividend 103.5. I can do this by moving both decimal points two places to the right. This changes the problem from $103.5 \div 0.45$ to the equivalent problem $10{,}350 \div 45$.

$$
\begin{array}{r}
230 \\
0.45\overline{)\,103.50} \\
-90 \\
\hline
135 \\
-135 \\
\hline
00 \\
-00 \\
\hline
0
\end{array}
$$

Solution: The quotient is 230. The answer is reasonable because it is close to the estimate of 200.

Learning Target:
I can divide decimals by decimals.

Example B

Find the quotient $103.5 \div 0.45$.

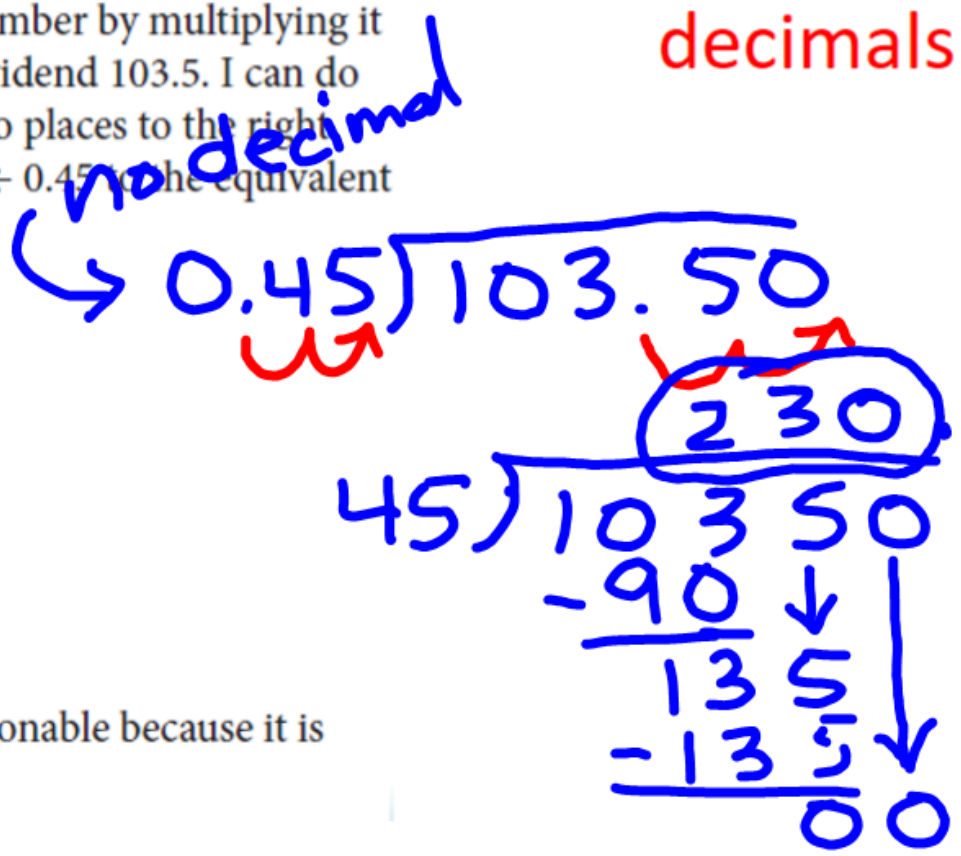
Step 1: Estimate the quotient.
Use compatible numbers. 103.5 is about 100; 0.45 is about 0.5.
$100 \div 0.5 = 200$. So, 200 is a good estimate of the quotient.

Step 2: Think: I can rewrite 0.45 as a whole number by multiplying it by 100. I'll do the same thing to the dividend 103.5. I can do this by moving both decimal points two places to the right. This changes the problem from $103.5 \div 0.45$ to the equivalent problem $10{,}350 \div 45$.

```
      230
0.45 | 103.50
     −90
      135
     −135
        00
       −00
         0
```

Solution: The quotient is 230. The answer is reasonable because it is close to the estimate of 200.

Learning Target:
I can divide decimals by decimals.



Try These B

Estimate each quotient. Then find the quotient.

a. $2.7\overline{)13.041}$ Quotient: _____

b. $0.31\overline{)682}$ Quotient: _____

$2.7\overline{)13.041}$

$27\overline{)130.41}$

$0.31\overline{)682.00}$

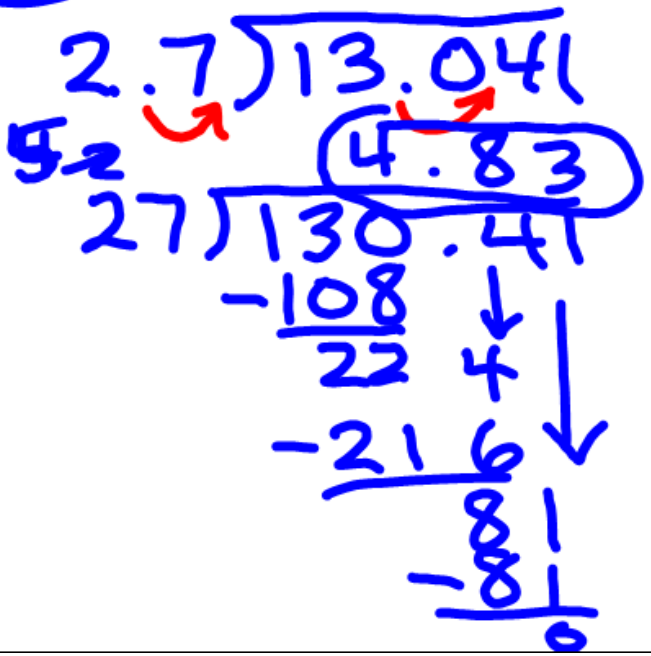
$31\overline{)68200}$

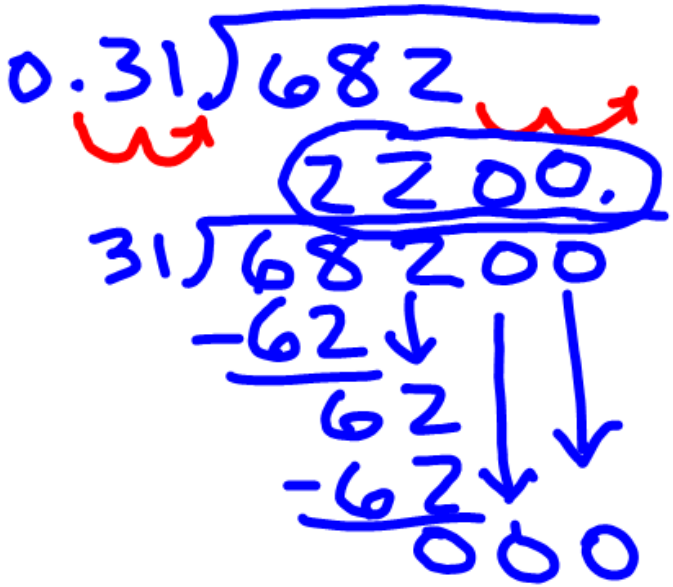
Try These B

Estimate each quotient. Then find the quotient.

a. $2.7\overline{)13.041}$ Quotient: _____

b. $0.31\overline{)682}$ Quotient: _____





Learning Target:
I can divide decimals.

What is the procedure for dividing decimals by whole numbers?

What is the procedure for dividing decimals by decimals?

Check Your Understanding

4. Complete.

a. $231 \div 5.07 = \_\_\_\_\_ \div 507$

b. $0.4472 \div 0.315 = \_\_\_\_\_ \div 315$

c. $61 \div 0.9 = \_\_\_\_\_ \div 9$

5. Imam makes bead bracelets. She can buy 12 beads for $2.04 or 17 beads for $3.57. Which deal gives her the lower cost for one bead? Explain.

6. Sam is saving $5.75 per week to buy a CD player that costs $46. How many weeks will he have to save before he can buy the player?

7. A 17.5-kilometer racecourse is divided into 2.5-kilometer portions. How many portions are there in the complete course?

HOMEWORK:

Google: Pg. 21 (4-7)

Paper: Pg. 21 (4-7, 10, 11)