

Dividing Decimals

Topic: CCSS 5.NBT.B.7 - Add, subtract, multiply, and divide decimals to hundredths...

Instructions: Demonstrate how to divide decimals.

Knowledge of long division is assumed

Demonstration

- **What is $2.1 \div 0.6$?**

- Setup the division as with numbers:

$$\begin{array}{r} \overline{0.6) 2.1} \end{array}$$

- Move the divisor's decimal point until it is a whole number:

$$\begin{array}{r} \overline{0.6) 2.1} \\ \underline{1} \end{array}$$

- Move the dividend's decimal point the same number of places:

$$\begin{array}{r} \overline{0.6) 2.1} \\ \underline{1} \\ \end{array}$$

- Divide the whole numbers as normal

$$\begin{array}{r} \underline{3} \\ 6) 21.0 \\ \underline{18} \\ 3 \end{array}$$

- Line up the quotient's decimal point with the dividend's decimal point (add trailing zeros if needed):

$$\begin{array}{r} \underline{3.} \\ 6) 21.0 \\ \underline{18} \\ 3 \end{array}$$

- Continue dividing as in long division

$$\begin{array}{r} \underline{3.5} \\ 6) 21.0 \\ \underline{18} \\ 30 \\ \underline{30} \\ 0 \end{array}$$

- Write the final answer:

$$2.1 \div 0.6 = 3.5$$

Summary of the Steps

- Setup the division as with numbers
- Move the divisor's decimal point until it is a whole number
- Move the dividend's decimal point the same number of places
- Divide the whole numbers as normal
- Line up the dividend's decimal point with the quotient (add trailing zeros if needed)
- Continue dividing as in long division
- Write the final answer

Your Turn

- What is $2.75 \div 0.25$?

The Solution

- What is $2.75 \div 0.25$?

$$\begin{array}{r} 0.25 \overline{) 2.75} \\ \underline{12} \\ 12 \\ \underline{12} \\ 0 \end{array}$$

$$\begin{array}{r} 11 \\ 25 \overline{) 275.0} \\ \underline{25} \\ 25 \\ \underline{25} \\ 0 \end{array}$$

The final answer: $2.75 \div 0.25 = 11$

What if the number of places behind the decimal point are not the same?

- Example: What is $16.2 \div 0.45$?

- Move the divisor's decimal point until it is a whole number
- Add trailing zeros to dividend if needed

$$\begin{array}{r} 0.45 \overline{) 16.20} \\ \underline{12} \\ 42 \\ \underline{45} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

- Divide as normal long division

$$\begin{array}{r} \underline{\quad} 36 \\ 45 \overline{) 1620} \\ \underline{135} \\ 270 \\ \underline{270} \\ 0 \end{array}$$

- Write the final answer:

$$16.2 \div 0.45 = 36$$

- **Another Example: What is $12.25 \div 0.5$?**

- Move the divisor's decimal point until it is a whole number

$$\begin{array}{r} \underline{\quad\quad\quad} \\ 0.5 \overline{) 12.25} \\ \underline{5} \\ 17 \\ \underline{10} \\ 70 \\ \underline{70} \\ 0 \end{array}$$

- Divide as normal long division
- Remember to line up the quotient's decimal point with the dividend's decimal point

$$\begin{array}{r} \underline{\quad 24.5} \\ 5 \overline{) 122.5} \\ \underline{10} \\ 22 \\ \underline{20} \\ 25 \\ \underline{25} \\ 0 \end{array}$$

- Write the final answer:

$$12.25 \div 0.5 = 24.5$$

What if the quotient keeps repeating?

- **Example: What is $13.7 \div 0.3$?**

- Setup the division as with numbers:

$$0.3 \overline{) 13.7}$$

- Move the decimal points until the divisor is a whole number:

$$3 \overline{) 137}$$

- Divide as normal:

$$\begin{array}{r} \underline{45.66} \\ 3 \overline{) 137.00} \\ \underline{12} \\ 17 \\ \underline{15} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 2 \end{array}$$

When a decimal repeats, the repeating portion is written with a bar over it

- Write the final answer:

$$13.7 \div 0.3 = 45.\overline{6}$$