

HOW TO MULTIPLY DECIMALS

1. Multiply normally, ignoring the decimal points.
2. **Then** put the decimal point in the answer - it will have as many decimal places as the two original numbers combined.

Example : **Multiply** 0.03 by 1.1

start with : 0.03×1.1
multiply without decimal points : $3 \times 11 = 33$
0.03 has **2 decimal places**,
and 1.1 has **1 decimal place**,
so the answer has **3 decimal places**: 0.033

DIVIDING A DECIMAL NUMBER BY A WHOLE NUMBER

1. Use Division or Long Division (ignoring the decimal point)
2. **Then** put the decimal point in the same spot as the dividend (the number being divided)

Example: **Divide** 9.1 by 7

Ignore the decimal point and use Long Division :

$$\begin{array}{r} 13 \\ 7 \overline{)91} \\ \underline{7} \\ 21 \end{array}$$

Put the decimal point in the answer directly above the decimal point in the dividend :

$$\begin{array}{r} 1.3 \\ 7 \overline{)9.1} \end{array}$$

The answer is :

1.3

DIVIDING BY DECIMAL NUMBER

1. Change the number we are dividing by to a whole number first, by **shifting the decimal point of both numbers** to the right:
2. It is safe to do this if we remember to shift the decimal point of both numbers the same number of places.

Example: **divide** 6.4 by 0.4

Move 1

$$6.4 \longrightarrow 64$$

$$0.4 \longrightarrow 4$$

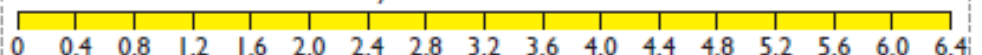
6.4/0.4 is exactly the same as 64/4, as we moved the decimal point of both numbers. Now we can calculate:

$$64 / 4 = 16$$

So the answer is:

$$6.4 / 0.4 = 16$$

Are there really 16 lots of 0.4 in 6.4? Let's see:





One minute brain training.



Column A

- 4 $\times 10 =$
- 9 $\times 10 =$
- 7 $\times 10 =$
- 2 $\times 10 =$
- 6 $\times 10 =$
- 8 $\times 10 =$
- 1 $\times 10 =$
- 12 $\times 10 =$
- 24 $\times 10 =$
- 56 $\times 10 =$
- 73 $\times 10 =$
- 82 $\times 10 =$
- 132 $\times 10 =$
- 27 $\times 10 =$
- 49 $\times 10 =$
- 379 $\times 10 =$
- 33 $\times 10 =$
- 732 $\times 10 =$
- 444 $\times 10 =$
- 80 $\times 10 =$

Column B

- 4 $\times 100 =$
- 8 $\times 100 =$
- 6 $\times 100 =$
- 9 $\times 100 =$
- 7 $\times 100 =$
- 5 $\times 100 =$
- 3 $\times 100 =$
- 15 $\times 100 =$
- 27 $\times 100 =$
- 63 $\times 100 =$
- 92 $\times 100 =$
- 11 $\times 100 =$
- 121 $\times 100 =$
- 17 $\times 100 =$
- 32 $\times 100 =$
- 124 $\times 100 =$
- 45 $\times 100 =$
- 320 $\times 100 =$
- 560 $\times 100 =$
- 75 $\times 100 =$

Column C

- 4 $\times 1000 =$
- 1 $\times 1000 =$
- 7 $\times 1000 =$
- 8 $\times 1000 =$
- 6 $\times 1000 =$
- 9 $\times 1000 =$
- 5 $\times 1000 =$
- 13 $\times 1000 =$
- 36 $\times 1000 =$
- 71 $\times 1000 =$
- 90 $\times 1000 =$
- 16 $\times 1000 =$
- 144 $\times 1000 =$
- 150 $\times 1000 =$
- 83 $\times 1000 =$
- 241 $\times 1000 =$
- 78 $\times 1000 =$
- 57 $\times 1000 =$
- 820 $\times 1000 =$
- 62 $\times 1000 =$

Column D

- 6 $\times 100 =$
- 10 $\times 1000 =$
- 17 $\times 10 =$
- 29 $\times 100 =$
- 2 $\times 1000 =$
- 28 $\times 10 =$
- 9 $\times 100 =$
- 19 $\times 1000 =$
- 93 $\times 10 =$
- 70 $\times 100 =$
- 712 $\times 1000 =$
- 201 $\times 10 =$
- 333 $\times 100 =$
- 76 $\times 1000 =$
- 46 $\times 10 =$
- 87 $\times 100 =$
- 45 $\times 1000 =$
- 473 $\times 10 =$
- 74 $\times 100 =$
- 165 $\times 1000 =$

Multiplying by 10, 100 and 1,000

Complete the table to show how you're using **multiplication to convert the following measurements** (the first one has been done for you):

Original measurement	Convert to	Multiply by	Answer
2 metres	centimetres	100	200 cm
15 kilograms	grams		
75 centimetres	millimetres		
4 litres	millilitres		
3.5 metres	centimetres		
12.5 kilometres	metres		
8.5 litres	millilitres		
1.5 kilograms	grams		
0.4 metres	centimetres		
2.5 centimetres	millimetres		
2 metres	millimetres		
0.75 kilograms	grams		
3 tonnes	kilograms		

Now check your answers - as well as checking the answer column, check that you've multiplied by the correct number.

Dividing by Multiples of Negative Powers of Ten (A)

Single-Digit Facts

$14 \div 7 =$

$14 \div 0.7 =$

$14 \div 0.07 =$

$14 \div 0.007 =$

$14 \div 0.0007 =$

$16 \div 2 =$

$16 \div 0.2 =$

$16 \div 0.02 =$

$16 \div 0.002 =$

$16 \div 0.0002 =$

$18 \div 6 =$

$18 \div 0.6 =$

$18 \div 0.06 =$

$18 \div 0.006 =$

$18 \div 0.0006 =$

$63 \div 9 =$

$63 \div 0.9 =$

$63 \div 0.09 =$

$63 \div 0.009 =$

$63 \div 0.0009 =$

$9 \div 1 =$

$9 \div 0.1 =$

$9 \div 0.01 =$

$9 \div 0.001 =$

$9 \div 0.0001 =$

$12 \div 3 =$

$12 \div 0.3 =$

$12 \div 0.03 =$

$12 \div 0.003 =$

$12 \div 0.0003 =$

$42 \div 7 =$

$42 \div 0.7 =$

$42 \div 0.07 =$

$42 \div 0.007 =$

$42 \div 0.0007 =$

$35 \div 7 =$

$35 \div 0.7 =$

$35 \div 0.07 =$

$35 \div 0.007 =$

$35 \div 0.0007 =$

$2 \div 2 =$

$2 \div 0.2 =$

$2 \div 0.02 =$

$2 \div 0.002 =$

$2 \div 0.0002 =$

$936 \div 8 =$

$936 \div 0.8 =$

$936 \div 0.08 =$

$936 \div 0.008 =$

$936 \div 0.0008 =$

Challenge

Dividing by Multiples of Positive Powers of Ten (B)

Single-Digit Facts

$8 \div 2 =$

$8 \div 20 =$

$8 \div 200 =$

$8 \div 2,000 =$

$8 \div 20,000 =$

$6 \div 2 =$

$6 \div 20 =$

$6 \div 200 =$

$6 \div 2,000 =$

$6 \div 20,000 =$

$48 \div 6 =$

$48 \div 60 =$

$48 \div 600 =$

$48 \div 6,000 =$

$48 \div 60,000 =$

$8 \div 4 =$

$8 \div 40 =$

$8 \div 400 =$

$8 \div 4,000 =$

$8 \div 40,000 =$

$18 \div 3 =$

$18 \div 30 =$

$18 \div 300 =$

$18 \div 3,000 =$

$18 \div 30,000 =$

$10 \div 2 =$

$10 \div 20 =$

$10 \div 200 =$

$10 \div 2,000 =$

$10 \div 20,000 =$

$8 \div 8 =$

$8 \div 80 =$

$8 \div 800 =$

$8 \div 8,000 =$

$8 \div 80,000 =$

$18 \div 2 =$

$18 \div 20 =$

$18 \div 200 =$

$18 \div 2,000 =$

$18 \div 20,000 =$

$63 \div 9 =$

$63 \div 90 =$

$63 \div 900 =$

$63 \div 9,000 =$

$63 \div 90,000 =$

$156 \div 2 =$

$156 \div 20 =$

$156 \div 200 =$

$156 \div 2,000 =$

$156 \div 20,000 =$

Challenge

Dividing by Multiples of Powers of Ten (A)

$$\begin{array}{rcl} 140 \div 2 & = & 88 \div 8 = \\ 1,400 \div 20 & = & 880 \div 80 = \\ 14,000 \div 200 & = & 8,800 \div 800 = \\ 140,000 \div 2,000 & = & 88,000 \div 8,000 = \end{array}$$

$$\begin{array}{rcl} 16 \div 2 & = & 10,800 \div 9 = \\ 160 \div 20 & = & 108,000 \div 90 = \\ 1,600 \div 200 & = & 1,080,000 \div 900 = \\ 16,000 \div 2,000 & = & 10,800,000 \div 9,000 = \end{array}$$

$$\begin{array}{rcl} 60 \div 3 & = & 132 \div 11 = \\ 600 \div 30 & = & 1,320 \div 110 = \\ 6,000 \div 300 & = & 13,200 \div 1,100 = \\ 60,000 \div 3,000 & = & 132,000 \div 11,000 = \end{array}$$

$$\begin{array}{rcl} 1,800 \div 3 & = & 132 \div 12 = \\ 18,000 \div 30 & = & 1,320 \div 120 = \\ 180,000 \div 300 & = & 13,200 \div 1,200 = \\ 1,800,000 \div 3,000 & = & 132,000 \div 12,000 = \end{array}$$

$$\begin{array}{rcl} 88,000 \div 11 & = & 8,000 \div 8 = \\ 880,000 \div 110 & = & 80,000 \div 80 = \\ 8,800,000 \div 1,100 & = & 800,000 \div 800 = \\ 88,000,000 \div 11,000 & = & 8,000,000 \div 8,000 = \end{array}$$

$$\begin{array}{rcl} 45 \div 5 & = & 1,600 \div 4 = \\ 450 \div 50 & = & 16,000 \div 40 = \\ 4,500 \div 500 & = & 160,000 \div 400 = \\ 45,000 \div 5,000 & = & 1,600,000 \div 4,000 = \end{array}$$

Multiplying by Multiples of Negative Powers of Ten (D)

Single-Digit Facts

7×9	$=$	9×3	$=$
7×0.9	$=$	9×0.3	$=$
7×0.09	$=$	9×0.03	$=$
7×0.009	$=$	9×0.003	$=$
7×0.0009	$=$	9×0.0003	$=$

6×6	$=$	2×7	$=$
6×0.6	$=$	2×0.7	$=$
6×0.06	$=$	2×0.07	$=$
6×0.006	$=$	2×0.007	$=$
6×0.0006	$=$	2×0.0007	$=$

1×7	$=$	4×8	$=$
1×0.7	$=$	4×0.8	$=$
1×0.07	$=$	4×0.08	$=$
1×0.007	$=$	4×0.008	$=$
1×0.0007	$=$	4×0.0008	$=$

3×2	$=$	8×4	$=$
3×0.2	$=$	8×0.4	$=$
3×0.02	$=$	8×0.04	$=$
3×0.002	$=$	8×0.004	$=$
3×0.0002	$=$	8×0.0004	$=$

5×3	$=$	13×3	$=$
5×0.3	$=$	13×0.3	$=$
5×0.03	$=$	13×0.03	$=$
5×0.003	$=$	13×0.003	$=$
5×0.0003	$=$	13×0.0003	$=$

Challenge

Multiplying by Multiples of Negative Powers of Ten (A)

$$\begin{array}{l} 30 \times 3 = \\ 300 \times 0.3 = \\ 3,000 \times 0.03 = \\ 30,000 \times 0.003 = \end{array}$$

$$\begin{array}{l} 1,000 \times 12 = \\ 10,000 \times 1.2 = \\ 100,000 \times 0.12 = \\ 1,000,000 \times 0.012 = \end{array}$$

$$\begin{array}{l} 3,000 \times 6 = \\ 30,000 \times 0.6 = \\ 300,000 \times 0.06 = \\ 3,000,000 \times 0.006 = \end{array}$$

$$\begin{array}{l} 500 \times 2 = \\ 5,000 \times 0.2 = \\ 50,000 \times 0.02 = \\ 500,000 \times 0.002 = \end{array}$$

$$\begin{array}{l} 8,000 \times 2 = \\ 80,000 \times 0.2 = \\ 800,000 \times 0.02 = \\ 8,000,000 \times 0.002 = \end{array}$$

$$\begin{array}{l} 80 \times 6 = \\ 800 \times 0.6 = \\ 8,000 \times 0.06 = \\ 80,000 \times 0.006 = \end{array}$$

$$\begin{array}{l} 700 \times 12 = \\ 7,000 \times 1.2 = \\ 70,000 \times 0.12 = \\ 700,000 \times 0.012 = \end{array}$$

$$\begin{array}{l} 50 \times 11 = \\ 500 \times 1.1 = \\ 5,000 \times 0.11 = \\ 50,000 \times 0.011 = \end{array}$$

$$\begin{array}{l} 600 \times 4 = \\ 6,000 \times 0.4 = \\ 60,000 \times 0.04 = \\ 600,000 \times 0.004 = \end{array}$$

$$\begin{array}{l} 800 \times 9 = \\ 8,000 \times 0.9 = \\ 80,000 \times 0.09 = \\ 800,000 \times 0.009 = \end{array}$$

$$\begin{array}{l} 3,000 \times 10 = \\ 30,000 \times 1 = \\ 300,000 \times 0.1 = \\ 3,000,000 \times 0.01 = \end{array}$$

$$\begin{array}{l} 800 \times 2 = \\ 8,000 \times 0.2 = \\ 80,000 \times 0.02 = \\ 800,000 \times 0.002 = \end{array}$$

Multiplying by Multiples of Negative Powers of Ten (E)

70×12	=	500×4	=
700×1.2	=	$5,000 \times 0.4$	=
$7,000 \times 0.12$	=	$50,000 \times 0.04$	=
$70,000 \times 0.012$	=	$500,000 \times 0.004$	=

20×6	=	$6,000 \times 10$	=
200×0.6	=	$60,000 \times 1$	=
$2,000 \times 0.06$	=	$600,000 \times 0.1$	=
$20,000 \times 0.006$	=	$6,000,000 \times 0.01$	=

9×6	=	$7,000 \times 12$	=
90×0.6	=	$70,000 \times 1.2$	=
900×0.06	=	$700,000 \times 0.12$	=
$9,000 \times 0.006$	=	$7,000,000 \times 0.012$	=

300×2	=	$9,000 \times 11$	=
$3,000 \times 0.2$	=	$90,000 \times 1.1$	=
$30,000 \times 0.02$	=	$900,000 \times 0.11$	=
$300,000 \times 0.002$	=	$9,000,000 \times 0.011$	=

50×3	=	$11,000 \times 2$	=
500×0.3	=	$110,000 \times 0.2$	=
$5,000 \times 0.03$	=	$1,100,000 \times 0.02$	=
$50,000 \times 0.003$	=	$11,000,000 \times 0.002$	=

4×11	=	70×11	=
40×1.1	=	700×1.1	=
400×0.11	=	$7,000 \times 0.11$	=
$4,000 \times 0.011$	=	$70,000 \times 0.011$	=

If you think you have trained hard enough to overcome the terrifying Catwoman then speak to your teacher... this one may be tricky...



If you win, then stick your certificate here and reflect on any areas you are strong at or may need to work on before you move forward.