Short Multiplication

Multiplying by a One-Digit Number

$$45 \times 6$$

1 Write the numbers above each other in the correct columns.

$$\begin{array}{r} 4\ 5 \\ \times \quad 6 \\ \hline \\ \hline \end{array}$$

2 Multiply the ones digit in the two-digit number by the one-digit number.

5 ones × 6 ones = 30 = 3 tens and 0 ones

Write 0 in the answer section and regroup the 3 tens by writing 3 above the tens column.

$$\begin{array}{r} 3 \\ 4\ 5 \\ \times \quad 6 \\ \hline 0 \end{array}$$

3 Multiply the tens digit in the two-digit number by the one-digit number and add any regrouped tens.

4 tens × 6 = 24 tens + 3 tens = 27 tens = 2 hundreds and 7 tens

Write the answer in the provided section.

$$\begin{array}{r} 3 \\ 4\ 5 \\ \times \quad 6 \\ \hline 2\ 7\ 0 \end{array}$$

4 45 × 6 = 270

Long Multiplication

Multiplying by a Two-Digit Number

154 × 26

1 Write the numbers above each other in the correct columns.

```
    1  5  4
  ×    2  6
  _____
```

2 First, multiply the ones in the three-digit number by the ones in the two-digit number.

4 ones × 6 ones = 24 ones = 2 tens and 4 ones

Write 4 in the answer section and regroup the 2 tens by writing 2 above the tens column.

```
       2
    1  5  4
  ×    2  6
  _____
          4
```

3 Next, multiply the tens in the three-digit numbers by the ones digits in the two-digit number and add any regrouped tens.

5 tens × 6 = 30 tens + 2 tens = 32 tens = 3 hundreds and 2 tens

Write 2 in the answer section and regroup the 3 hundreds by writing 3 above the hundreds column.

```
    3  2
    1  5  4
  ×    2  6
  _____
       2  4
```

4 Finally, multiply the hundreds in the three-digit numbers by the ones digits in the two-digit number and add any regrouped hundreds.

1 hundred × 6 = 6 hundreds + 3 hundreds = 9 hundreds

Write 9 in the answer section.

```
    3  2
    1  5  4
  ×    2  6
  _____
    9  2  4
```

Long Multiplication

Multiplying by a Two-Digit Number

5 Cross out any previous regroupings.

In the next section, multiply the ones in the three-digit number by the tens in the two-digit number

Because the calculation involves multiplying by 20, a zero needs to be placed in the right-hand column as a place holder.

4 ones × 2 tens = 8 tens

Write 8 in the answer section.

$$
\begin{array}{ccc}
 & \cancel{3} & \cancel{2} \\
1 & 5 & 4 \\
\times & 2 & 6 \\
\hline
9 & 2 & 4 \\
 & 8 & 0 \\
\hline
\end{array}
$$

6 Multiply the tens in the three-digit number by the tens in the two-digit number and add any regrouped hundreds.

5 tens × 2 tens = 1 thousand

Write 0 in the answer section and regroup the 1 thousands by writing a 1 above the thousands column.

$$
\begin{array}{cccc}
1 & \cancel{3} & \cancel{2} & \\
 & 1 & 5 & 4 \\
 & \times & 2 & 6 \\
\hline
 & 9 & 2 & 4 \\
0 & 8 & 0 & \\
\hline
\end{array}
$$

7 Multiply the hundreds in the three-digit number by the tens in the two-digit number and add any regrouped thousands.

1 hundred × 2 tens = 2 thousands + 1 thousand = 3 thousands

Write 3 in the answer section.

$$
\begin{array}{cccc}
1 & \cancel{3} & \cancel{2} & \\
 & 1 & 5 & 4 \\
 & \times & 2 & 6 \\
\hline
 & 9 & 2 & 4 \\
3 & 0 & 8 & 0 \\
\hline
\end{array}
$$

8 Combine the totals using regrouping if required.

9 154 × 26 = 4004

$$
\begin{array}{cccc}
1 & \cancel{3} & \cancel{2} & \\
 & 1 & 5 & 4 \\
 & \times & 2 & 6 \\
\hline
 & 9 & 2 & 4 \\
3 & 0 & 8 & 0 \\
\hline
4 & 0 & 0 & 4 \\
 & 1 & 1 & \\
\end{array}
$$

Short Division

Dividing by a One-Digit Number

$$84 \div 6$$

1 Partition 84 into tens and ones.

Work out how many 6s divide into 80 so that the answer is a multiple of 10.

In this case, the highest multiple of 10 divisible by 6 is 60.

Partition 84 into 60 and 24 then divide each number by 6.

Combine the totals.

2 Combine the totals.

$$
\begin{array}{c}
\quad 1 \quad 0 \; + \; 4 \\
\hline
6 \mid 6 \quad 0 \; + \; 2 \quad 4
\end{array}
$$

3 This can be shortened to:

$$
\begin{array}{c}
\quad 1 \quad 4 \\
\hline
6 \mid 8 \; {}^{2}4
\end{array}
$$

Short Division

Dividing by a Two-Digit Number

5284 ÷ 12

1

12 | 5 ⁵2 8 4

First we divide 5 (thousands) by 12. This gives a result of 0 with a remainder of 5. The remainder 5 (thousands) is exchanged for 50 hundreds and placed into the hundreds column. This is shown by a small 5 in front of the existing 2 hundreds to make 52 hundreds.

2

4

12 | 5 ⁵2 ⁴8 4

Next, we divide 52 (hundreds) by 12. This gives a result of 4 (hundreds) remainder 4. The remainder 4 (hundreds) is exchanged for 40 tens and placed into the tens column. This is shown by a small 4 in front of the existing 8 tens to make 48 tens. The 4 is written in the hundreds position of the answer above the line.

3

4 4

12 | 5 ⁵2 ⁴8 4

Next we divide 48 (tens) by 12. This gives a result of 4. The 4 is written in the tens position of the answer above the line.

4

4 4 0

12 | 5 2 8 4

Next, we divide 4 (ones) by 12. This cannot be done, so there are four remaining. A zero is placed in the ones answer section as well as remainder 4.

5284 ÷ 12 = 440 r4

Short Division

Dividing by a Two-Digit Number Resulting in a Decimal Answer

5286 ÷ 12

1

$$12 \overline{\smash{)}5\,^{5}2\;8\;6}$$

First, divide 5 (thousands) by 12. This gives a result of 0 with a remainder of 5. The remainder 5 (thousands) is exchanged for 50 hundreds and placed into the hundreds column. This is shown by a small 5 in front of the existing 2 hundreds to make 52 hundreds.

2

$$\begin{array}{c} 4 \\ 12 \overline{\smash{)}5\,^{5}2\,^{4}8\;6} \end{array}$$

Next, divide 52 (hundreds) by 12. This gives a result of 4 (hundreds) remainder 4. The remainder 4 (hundreds) is exchanged for 40 tens and placed into the tens column. This is shown by a small 4 in front of the existing 8 tens to make 48 tens. The 4 is written in the hundreds position of the answer above the line.

3

$$\begin{array}{c} 4\;\;4 \\ 12 \overline{\smash{)}5\,^{5}2\,^{4}8\;6} \end{array}$$

Next, divide 48 (tens) by 12. This gives a result of 4. The 4 is written in the tens position of the answer above the line.

4

$$\begin{array}{c} 4\;\;4\;\;0 \\ 12 \overline{\smash{)}5\,^{5}2\,^{4}8\;6.\,^{6}0} \end{array}$$

Next, divide 6 (ones) by 12. This cannot be done. This gives a result of 0 with a remainder of 6. Extend the number being divided to show the tenths place. The remainder 6 (ones) can now be exchanged for 60 tenths and placed into the tenths column. This is shown by a small 6 in front of 0 tenths to make 60 tenths. Remember to place the decimal point in your answer section.

5

$$\begin{array}{c} 4\;\;4\;\;0.\;\;5 \\ 12 \overline{\smash{)}5\,^{5}2\,^{4}8\;6.\,^{6}0} \end{array}$$

Next, divide 60 (tenths) by 12. This gives a result of 5. The 5 is written in the tenths position of the answer above the line.

6

5286 ÷ 12 = 440.5

Long Division

Dividing by a Two-Digit Number Resulting in a Decimal Answer

591 ÷ 12

Work out the answer to two decimal places.

1

answer section

```
            4
      _____
12 |  5   9   1
      4   8
      _____
      1   1   1
```

First, work out how many 12s there are in 59. The answer to this question is 4, which is written above the 9. We then write the product of 4 and 12 (48) under 59 and subtract giving 11. The 1 is then brought down and written next to 11 to make 111.

2

answer section

```
            4   9
      _____
12 |  5   9   1
      4   8
      _____
      1   1   1
      1   0   8
      _____
              3
```

Next, work out how many 12s there are in 111. The answer to this question is 9, which is written above the 1. Then, write the product of 9 and 12 (108) under 111 and subtract it, giving 3.

3

answer section

```
            4   9   .
      _____
12 |  5   9   1 . 0   0
      4   8
      _____
      1   1   1
      1   0   8
      _____
              3 . 0
```

Extend 591 into decimals to continue the process of long division.
The 0 in the tenths place is then brought down and written next to 3 to make 30.

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Long Division

Dividing by a Two-Digit Number Resulting in a Decimal Answer

4

answer section

```
        4  9 . 2
12 | 5  9  1 . 0  0
    4  8
    1  1  1
    1  0  8
          3 . 0
          2 . 4
             6  0
```

Next, work out how many 12s there are in 30. The answer to this question is 2, which is written above the 0 in the tenths place. Then, write the product of 2 and 12 (24) under 30 and subtract it, giving 6. The 0 is then brought down and written next to 6 to make 60.

5

answer section

```
        4  9 . 2  5
12 | 5  9  1 . 0  0
    4  8
    1  1  1
    1  0  8
          3 . 0
          2 . 4
            . 6  0
            . 6  0
                 0
```

Next, find out how many 12s there are in 60. The answer to this question is 5, which is written above the 0 in the hundredths place. Then, write the product of 5 and 12 (60) under 60 and subtract it, giving zero.

591 ÷ 12 = 49.25