

Long multiplication

To achieve 100+ you need to:

- ★ solve complex problems using the written method of long multiplication.



What you need to know

- Long multiplication is done in two parts: first by multiplying the ones, and then by multiplying the tens. Add the numbers to find the answer.

Let's practise



A factory has 1,478 boxes of beans. There are 32 tins of beans in each box. How many tins of beans is this altogether?



- 1 Read the question and read it again. What is it asking?
- 2 Estimate the answer.
- 3 The multiplication is done in two parts. First multiply by the ones.
- 4 Next, multiply by the tens. Place a zero in the ones column to represent multiplying by 10, and then multiply by the 3.
- 5 Add the two together. What is your answer?
- 6 Check your answer is close to your estimate.

Multiply 1,478 by 32.

1,478 is about 1,500. 32 is about 30.
 $1,500 \times 30 = 45,000$
 The answer will be about 45,000.

$$\begin{array}{r} 1\ 4\ 7\ 8 \\ \times \quad 3\ 2 \\ \hline 2\ 9\ 5\ 6 \\ 4\ 4\ 3\ 4\ 0 \\ \hline 47\ 296 \end{array} \quad 1,478 \times 2 = 2,956$$

$$\begin{array}{r} 1\ 4\ 7\ 8 \\ \times \quad 3\ 2 \\ \hline 2\ 9\ 5\ 6 \\ 4\ 4\ 3\ 4\ 0 \\ \hline 47\ 296 \end{array} \quad \begin{array}{l} 1,478 \times 3 = 4,434, \text{ so} \\ 1,478 \times 30 = 44,340 \end{array}$$

$$\begin{array}{r} 1\ 4\ 7\ 8 \\ \times \quad 3\ 2 \\ \hline 2\ 9\ 5\ 6 \\ +\ 4\ 4\ 3\ 4\ 0 \\ \hline 47\ 296 \end{array}$$

47,296 is close to 45,000.

Try this

- 1 It is 1,161 km from London to Rome. A plane flies there and back four times a month. How far does the plane fly in a year?

Top tip

- Don't forget the placeholder zero when multiplying by the tens digit.

Long division

To achieve 100+ you need to:

- ★ use long division to solve problems and interpret remainders in context
- ★ use written division methods where the answer has up to two decimal places.



What you need to know

- The short division method can also be used to divide larger numbers by two-digit numbers. Remember to show the numbers carried over. $12 \overline{) 496}$

Let's practise



Maria buys a yearly train pass for £2,799. She uses it for a total of 45 weeks. How much does it cost her to travel by train each week?



- 1 Read the question and read it again. What is it asking?
- 2 Look at the numbers and make an estimate.
- 3 Start by dividing 279 by 45 to find how many times 45 goes into 279. Write 6 in the answer space and record 270 (45×6) below 279 so the remainder can be found.
- 4 Bring down the digit 9. Divide 99 by 45 to find out how many times 45 goes into 99. Write 2 in the answer space and record 90 (45×2) below 99 so the remainder can be found.
- 5 A remainder must be shown as a decimal for the context of money. As no more whole 'lots of 45' go into 9, put a decimal point and a zero next to 2,799 and in the answer space. Bring down the zero as before.
- 6 What is your answer? Use two decimal places for money.

I have to divide 2,799 by 45.

$2,800 \div 50$ is a bit more than 56.

$$\begin{array}{r} 6 \\ 45 \overline{) 2\ 7\ 9\ 9} \\ \underline{2\ 7\ 0} \\ 9 \end{array}$$

$$\begin{array}{r} 6\ 2 \\ 45 \overline{) 2\ 7\ 9\ 9} \\ \underline{2\ 7\ 0} \downarrow \\ 9\ 9 \\ \underline{9\ 0} \\ 9 \end{array}$$

$$\begin{array}{r} 6\ 2.2 \\ 45 \overline{) 2\ 7\ 9\ 9.0} \\ \underline{2\ 7\ 0} \downarrow \\ 9\ 9 \downarrow \\ \underline{9\ 0} \downarrow \\ 9\ 0 \end{array}$$

£62.20

Try this

- 1 2,822 T-shirts are packed into boxes of 28: how many full boxes will there be?