

# Multiply a 3-digit number by a 1-digit number

## Notes and guidance

Following on from the previous step, children extend the formal written method to multiplying a 3-digit number by a 1-digit number. They continue to use the short multiplication method, but now with more columns. Children need to be secure with the previous step before moving on to this one.

Place value counters in place value charts are again used to model the structure of the formal method, allowing children to gain a greater understanding of the procedure, particularly where exchanges are needed. They continue to use the counters to exchange groups of 10 ones for 1 ten and also exchange 10 tens for 1 hundred and 10 hundreds for 1 thousand. This is mirrored by the positioning of the exchanged digit in the formal written method.

The focus here is on the short written method, but the expanded method could be used to support understanding for children who need it.

## Things to look out for

- The use of a zero in the ones or tens column can sometimes expose misunderstandings, as children can be unsure of multiplying by zero.
- Children may omit the exchange or include the exchange in an incorrect place on the formal written method.

## Key questions

- How could you use counters to represent the multiplication?
- How does the written method match the representation?
- Which column should you start with?
- Do you need to make an exchange? What exchange can you make?
- What is the same and what is different about multiplying a 3-digit number by a 1-digit number and multiplying a 2-digit number by a 1-digit number?

## Possible sentence stems

- \_\_\_\_\_ ones  $\times$  \_\_\_\_\_ = \_\_\_\_\_ ones  
\_\_\_\_\_ tens  $\times$  \_\_\_\_\_ = \_\_\_\_\_ tens  
\_\_\_\_\_ hundreds  $\times$  \_\_\_\_\_ = \_\_\_\_\_ hundreds
- \_\_\_\_\_ tens/hundreds multiplied by \_\_\_\_\_ plus the ten/  
hundred from the exchange is equal to \_\_\_\_\_

## National Curriculum links

- Multiply 2-digit and 3-digit numbers by a 1-digit number using formal written layout

# Multiply a 3-digit number by a 1-digit number

## Key learning

- Use the place value chart to help you complete the calculation.

| Hundreds | Tens | Ones  |
|----------|------|-------|
| 100 100  | 10   | 1 1 1 |
| 100 100  | 10   | 1 1 1 |
| 100 100  | 10   | 1 1 1 |

|   | H | T | O |
|---|---|---|---|
|   | 2 | 1 | 3 |
| × |   |   | 3 |
|   |   |   |   |
|   |   |   |   |

- Use the place value chart to help you complete the calculation.

| Hundreds    | Tens  | Ones |
|-------------|-------|------|
| 100 100 100 | 10 10 |      |
| 100 100 100 | 10 10 |      |
| 100 100 100 | 10 10 |      |
| 100 100 100 | 10 10 |      |

|   | Th | H | T | O |
|---|----|---|---|---|
|   |    | 3 | 2 | 0 |
| × |    |   |   | 4 |
|   |    |   |   |   |
|   |    |   |   |   |

- Use place value counters and the written method to work out the multiplications.

$$420 \times 3$$

$$4 \times 601$$

$$2 \times 530$$

- A school has 4 house teams.

There are 234 children in each house team.

How many children are there altogether?

| Hundreds | Tens     | Ones    |
|----------|----------|---------|
| 100 100  | 10 10 10 | 1 1 1 1 |
| 100 100  | 10 10 10 | 1 1 1 1 |
| 100 100  | 10 10 10 | 1 1 1 1 |
| 100 100  | 10 10 10 | 1 1 1 1 |

|   | H | T | O |
|---|---|---|---|
|   | 2 | 3 | 4 |
| × |   |   | 4 |
|   |   |   |   |
|   |   |   |   |

- Complete the calculations.

|   | H | T | O |
|---|---|---|---|
|   | 2 | 0 | 5 |
| × |   |   | 3 |
|   |   |   |   |
|   |   |   |   |

|   | H | T | O |
|---|---|---|---|
|   | 1 | 4 | 8 |
| × |   |   | 6 |
|   |   |   |   |
|   |   |   |   |

|   | H | T | O |
|---|---|---|---|
|   | 7 | 4 | 6 |
| × |   |   | 5 |
|   |   |   |   |
|   |   |   |   |

- Dani reads 164 pages of a book.

Tom reads 3 times as many pages as Dani.

How many pages does Tom read?

How many pages do they read altogether?

# Multiply a 3-digit number by a 1-digit number

## Reasoning and problem solving

Sam and Jack have both completed the same multiplication.

**Sam**

|  |   |    |   |   |   |
|--|---|----|---|---|---|
|  |   |    |   |   |   |
|  |   | Th | H | T | O |
|  |   |    | 2 | 3 | 4 |
|  | x |    |   |   | 6 |
|  |   | 1  | 2 | 0 | 4 |
|  |   |    | 2 | 2 |   |

**Jack**

|  |   |    |   |   |   |
|--|---|----|---|---|---|
|  |   |    |   |   |   |
|  |   | Th | H | T | O |
|  |   |    | 2 | 3 | 4 |
|  | x |    |   |   | 6 |
|  |   | 1  | 4 | 0 | 4 |
|  |   |    | 2 | 2 |   |

Who has the correct answer?

What mistake did the other child make?

Jack

Sam did not add the 2 hundreds that she exchanged from the tens column.

Arrange the digit cards in the multiplication.

|   |   |   |   |
|---|---|---|---|
| 2 | 4 | 6 | 8 |
|   |   |   |   |
|   |   |   |   |
|   |   |   |   |

What is the greatest possible product?

Now arrange the cards to make the smallest possible product.

What strategies did you use?



$$642 \times 8 = 5,136$$

$$468 \times 2 = 936$$

$$321 \times 3 = 963$$

Without working it out, which would be greater,  $321 \times 4$  or  $322 \times 3$ ?

Check your answer by working it out.

$$321 \times 4$$