Multiply a 2-digit number by a 1-digit number – with exchange

Notes and guidance

In this small step, children continue to explore multiplying 2-digit numbers by 1-digit numbers, now looking at calculations that involve an exchange.

As in the previous step, children apply their understanding of partitioning to represent and solve calculations using the expanded method. This involves partitioning the 2-digit number into tens and ones, multiplying separately, then adding the partial products together. Children use the same representations as in the previous steps to provide familiarity and focus their attention on the new aspect of making an exchange.

Use of the expanded method allows children to gain a deep understanding of the structure of the calculation before progressing to formal short multiplication in Year 4

Things to look out for

- Children may partition a 2-digit number into single digits rather than tens and ones, for example $48 \times 8 = 4 \times 8 + 8 \times 8$

- Children may not line up partial products correctly.

- Children may struggle when making an exchange, including forgetting to add on any exchanges.

Key questions

- How can you partition a 2-digit number into tens and ones?

- What is the product of the tens and the single digit?

- What is the product of the ones and the single digit?

- What do you need to do to find the final answer?

- What do you do if you have ten or more ones?

Possible sentence stems

- _____ tens and _____ ones multiplied by _____ is equal to _____ tens multiplied by _____ and _____ ones multiplied by _____

- _____ ones is _____ tens and _____ ones.

- _____ × _____ = _____ tens × _____ + _____ × _____

National Curriculum links

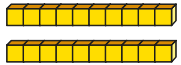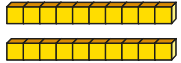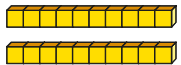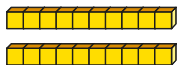- Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for 2-digit numbers times 1-digit numbers, using mental and progressing to formal written methods

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Key learning

- Complete the number sentences.

  Use the place value chart to help you.

Tens	Ones

  2 tens × 4 = _____ tens

  4 ones × 4 = _____ ones

  24 × 4 = _____ + _____ = _____

  24 × 4 = _____

- Use the place value chart and counters to work out 45 × 3

Tens	Ones

  4 tens × 3 = _____ tens

  5 ones × 3 = _____ ones

  _____ + _____ = _____

  45 × 3 = _____

- Use a place value chart and base 10 to work out the multiplications.

  | 13 × 4 | | 23 × 4 | | 14 × 8 | | 25 × 3 |

- Mo uses a part-whole model to work out 24 × 8

  24
  20   4
  ×8   ×8
  160   32
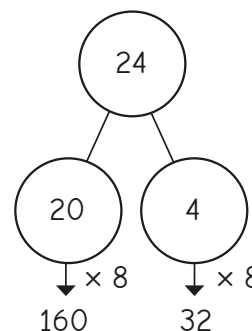
  160 + 32 = 192

  24 × 8 = 192

  Use Mo's method to work out the multiplications.

  | 18 × 4 | | 73 × 5 | | 42 × 5 | | 28 × 8 |

- Complete the workings.

  ▶ 64 × 3

  = ___ tens × 3 + ___ ones × 3

  = ___ + ___

  = ___

  ▶ 24 × 8

  = 20 × 8 + 4 × 8

  = ___ + ___

  = ___

Multiply a 2-digit number by a 1-digit number – with exchange

Reasoning and problem solving

Is the statement always true, sometimes true or never true?

> A 2-digit number multiplied by a 1-digit number has a 2-digit answer.

Explain your answer.

sometimes true

Aisha is sorting out two cupboards.

In the first cupboard, there are 4 boxes with 34 pencils in each box.

In the second cupboard, there are 5 boxes with 28 pencils in each box.

Which cupboard has more pencils?

second cupboard

Here are some digit cards.

| 2 | 3 | 4 |

Use each digit card once to create a multiplication.

☐ ☐ × ☐

Which multiplication gives an answer closest to 100?

23 × 4 = 92

Use the fact to compare the multiplications. Write < or > to make the statement correct.

> 8 × 44 = 352

8 × 45 ◯ 9 × 44

<

How did the fact help you?