Related calculations

Notes and guidance

This small step builds on the previous step and children's existing knowledge of times-tables to explore calculations related to known facts.

Children explore scaling facts by 10, for example using 3 × 4 = 12 to derive 3 × 40 = 120 and 30 × 4 = 120. A range of representations are used to expose the link between multiples of 1 and multiples of 10. Children begin by using base ten, before moving on to the slightly more abstract representation of place value counters. Children go on to explore this relationship with division, for example using 12 ÷ 3 = 4 to derive 120 ÷ 3 = 40. This will be revisited later in the block.

Care should be taken to ensure that children do not also think that 12 ÷ 30 = 40. This is a good opportunity to remind them that multiplication is commutative while division is not.

Things to look out for

- Children may derive incorrect division facts by using the rules they have learnt about related multiplication facts.
- Children may try to find results by calculation rather than recognising the relationship between one fact and another.

Key questions

- What is the same and what is different about the two calculations?
- How can you represent the calculation using place value counters/base 10?
- How is multiplying by 10s different from multiplying by 1s?
- What is the connection between the two calculations?

Possible sentence stems

- _____ × _____ ones is equal to _____ ones, so _____ × _____ tens is equal to _____ tens.

- _____ ÷ _____ is equal to _____, so _____ tens ÷ _____ is equal to _____ 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

Related calculations

Key learning

- Complete the number sentences to match the pictures.
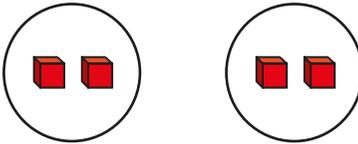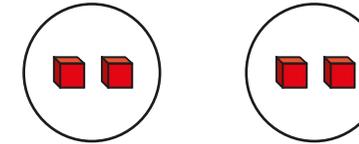
  ▶ 4×2 ones = _____ ones 4×2 = _____
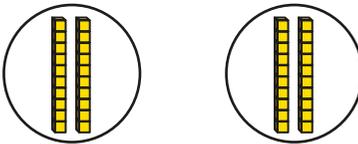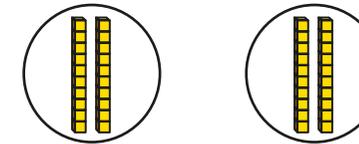
  ▶ 4×2 tens = _____ tens 4×20 = _____

- Complete the multiplication facts.

  _____ $\times 4$ = _____   _____ $\times 40$ = _____

- I know that $2 \times 8 = 16$
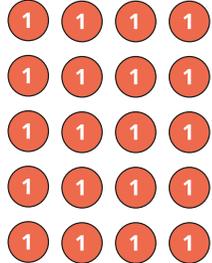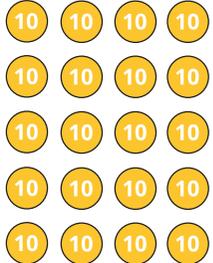
  Use Rosie's fact to complete the multiplications.

  ▶ 2×80 = _____   ▶ 20×8 = _____   ▶ 8×20 = _____

- Use the place value counters to complete the divisions.

  $15 \div 3$ = _____
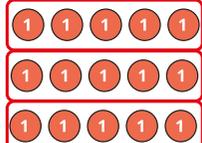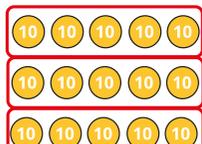
  15 tens $\div 3$ = _____

- Use place value counters to help complete the calculations.

  ▶ $27 \div 9$ = _____   ▶ $54 \div 6$ = _____   ▶ $48 \div 4$ = _____

  $270 \div 9$ = _____ $540 \div 6$ = _____ $480 \div 4$ = _____

- 4 family tickets to a theme park cost £240 in total.

  How much does 1 family ticket cost?

Related calculations

Reasoning and problem solving

I know
$2 \times 6 = 12$, so
$2 \times 60 = 120$

Tiny is correct.

Write the fact family for this multiplication.

$60 \times 2 = 120$

$120 \div 2 = 60$

$120 \div 60 = 2$

Use the number cards to complete the calculations.

9	9	10	10	100	900	900

You can use each card only once.

$900 \div \boxed{} = 100$

$\boxed{} \div \boxed{} = 9$

$\boxed{} \times \boxed{} = \boxed{} \div \boxed{}$

$900 \div \mathbf{9} = 100$

$\mathbf{900} \div \mathbf{100} = 9$

$\mathbf{9} \times \mathbf{10} = \mathbf{900} \div \mathbf{10}$

Scott has 240 cakes to sell.

He chooses one size of box and puts the same number of cakes in each box.

He has no cakes left over.

Which of these boxes could he use?

10   20   30   40   50

60   80   100
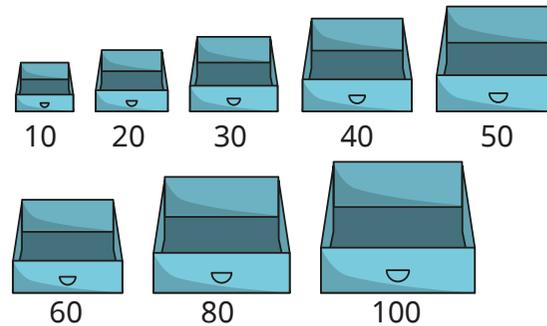
10, 20, 30, 40, 60 or 80

Is the statement true or false?

$5 \times 30 = 3 \times 50$

Explain your answer.

True