

Multiplication $T0 \times T0$ using factors

National Curriculum attainment target

- Multiply numbers mentally drawing upon known facts

Lesson objectives

- Multiply numbers mentally drawing upon known facts
- Multiply $T0 \times T0$ using factors

Previous related lessons

Unit 4, Week 2, Lesson 4; Unit 8, Week 1, Lesson 1

Prerequisites for learning

Pupils need to:

- recall the multiplication tables up to 12×12 and associated facts involving multiples of 10
- understand the terms factor and multiple
- double and halve whole numbers

Vocabulary

multiple, multiplied by, multiplication, divided by, division, product, factor

Future related lessons

Unit 10, Week 1, Lesson 4

Success criteria

Pupils can:

- use their knowledge of multiplication tables up to 12×12 to find factors
- identify multiples of all multiplication tables up to 12×12 and associated facts involving multiples of 10
- identify appropriate methods of calculating answers



Getting Started

- Choose an activity from Number – Multiplication and division.
- Choose a game or activity from *Fluency in Number Facts: Y5/Y6* – Multiplication and division.

Teach

Resources

mini whiteboard, pen and eraser (per child)



- Review how doubling and halving can help solve some multiplication calculations.
- Write on the board: $24 \times 16 =$
- Say: **Would it be easy to work this calculation out mentally?** (No)
- Demonstrate how the process of doubling and halving can make this calculation easier to answer:
 24×16
 48×8
- Say: **Explain to your partner what you think the process is for working out the answer in this way and why it works.**
- Ask children for their explanations.
- Say: **This mental strategy helps us to work out the answer to calculations using doubling and halving. This makes some calculations easier but cannot be used for all calculations so it is important that we only use it in cases where it makes calculations easier.**
- Show another example: 14×24 . Demonstrate how doubling the first number and halving the second number until we have a calculation that is easy to answer mentally will lead to the same answer:
 14×24
 28×12
 $56 \times 6 = 336$
- Write 14×24 on the board again.
- Say: **We are going to use another strategy, which involves using factors to find the product of this calculation. We can break one of the numbers in our calculation into its factors and then multiply.**

Collins
Connect

Year 5, Unit 10,
Week 1



- Write $14 \times 4 \times 6$ on the board.
- Say: **Explain to your partner what you think the process is for working out the answer in this way and why it works.**
- Say: **4×6 is the same as 24 so the calculation is the same but is made easier by multiplying by one-digit numbers.**



- Calculate the answer using this strategy, i.e. $14 \times 4 = 56$, $56 \times 6 = 336$. Note that the answer is the same as the previous doubling and halving strategy.
- Say: **Discuss with your partner other ways that 14×24 could be split into factors to make the calculation easier. Record them on your mini whiteboard.** ($14 \times 6 \times 4$; $7 \times 2 \times 24$; $2 \times 7 \times 24$)
- Share strategies and check answers as a class.
- Repeat with other examples, e.g. 15×46 , 25×32 , 24×16 , 42×24 . Include examples where the strategy does not make calculations easier, e.g. 17×28 . Discuss the reason why. (17 is a prime number so only has two factors, itself and 1 so the calculation does not change.)

Individualised Learning

Refer to Activities 3 and 4 from the Learning activities on page 387.

Pupil Book 5C: – Page 32: Multiplication TO $\times$ TO using factors

Plenary

Resources

mini whiteboard, pen and eraser (per child)



- Reinforce the multiplication strategy using factors taught in the lesson.
- Write some examples on the board, e.g. 26×15 , 13×36 , 22×26 , 17×24
- Ask children to discuss which examples the method is most appropriate for and why. (Some calculations enable them to work out calculations mentally. The ones that are least effective are where a prime number is one of the multiplicands or where the multiplicand is a larger two-digit number.)

Overcoming Barriers

- Some children may have difficulty recognising the factors of numbers if they do not have quick recall of the multiplication tables up to 12×12 . Continue regular practice of these.