Multiplication TO x O using the formal written method

National Curriculum attainment target

- Multiply two-digit numbers by a one-digit number using formal written layout

Lesson objectives

- Use the formal written method to calculate TO × O
- Estimate and check the answer to a calculation

Previous related lesson

Unit 4, Week 2, Lesson 4

Prerequisites for learning

Pupils need to:

- recall the multiplication tables up to 12 x 12
- understand the effect of multiplying a number by ten
- add using the efficient method of column addition

Vocabulary

multiple, key fact, multiplied by, multiplication, estimate, approximate, partition, hundreds, tens, ones (units)

Future related lessons

Unit 10, Week 1, Lesson 1; Unit 10, Week 1, Lesson 2

Success criteria

Pupils can:

- make a reasonable estimate for the answer to a calculation
- mentally partition two-digit numbers into tens and ones
- recall all the multiplication facts for multiplication tables up to 12 x 12 and multiply all by a multiple of 10

Getting Started

- Choose an activity from Number – Multiplication and division.
- Choose an activity from *Fluency in Number Facts: Y3/Y4* – Multiplication and division.

Collins Connect
Year 4, Unit 6, Week 1

Teach

Use examples containing multiplication facts children are more secure with, for example, × 2, × 3, × 4, × 5.

The focus of this lesson moves from using formal expanded methods for multiplication calculations to the efficient and compact method of multiplication.

The word "ones" has been used throughout this lesson when referring to the least significant digit. However, children also need to be familiar with the word "units".

- Write on the whiteboard a two-digit number multiplied by a one-digit number, for example, 68 × 9 =
- Ask: **What would the approximate answer to this calculation be?** (630)
- Refer children back to the calculation.
- Say: **Explain to your partner how you would work out the answer to this question.**
- Ask children to share their explanations with the class.
- Review how to multiply these numbers using the formal expanded method:

H	T	O	
	6	8	
×		9	
	7	2	(8 × 9)
5	4	0	(60 × 9)
6	1	2	
1			

- Ask: **What is 8 multiplied by 9?** (72). Ask: **What is 60 multiplied by 9?** (540). Add the ones column, then the tens column, then the hundreds column, being sure to add any numbers that have been carried over.
- Compare the answer with the estimate.
- Write the same calculation on the whiteboard: 68 × 9 =
- Say: **Today we are going to learn a quicker method of recording the answer to two-digit multiplied by one-digit calculations. This method is more efficient when we are multiplying larger numbers. We will use the same calculation and compare our answers at the end to check they are the same.**

- Demonstrate on the board how to use the compact method to calculate 68 × 9.
- Explain that in this method, we do not record all of our working out, much of it is done mentally.

H	T	O
	6	8
×		9
6	1	2
	7	

You may prefer to write the carry digit under the answer. The advantage of placing it above the answer is that it is easy for children to see that 8 × 9 equals 72 is still part of the same calculation.

- Say: **We start by multiplying the numbers in the ones column.** Ask: **What is 8 multiplied by 9?** (72) Say: **72 is 7 tens and 2 ones. We write the 2 in the ones column and add the 70 or 7 tens after we have calculated 60 multiplied by 9. To remind us to add the 7 tens, we write a small 7 in the tens column just above the answer.**
- Ask: **What is 60 multiplied by 9?** (540). Say: **540 add the 70 from the previous calculation** (8 multiplied by 9), **gives a total of 610.** Record this in the correct position giving a total of 612.
- Compare the two answers from the formal expanded method and the efficient compact method. Say: **The answers are the same.**
- Continue with other examples using the efficient compact method until you feel the majority of the children have understood the method.
- At various intervals, ask children to share their explanations with the class.

Individualised Learning

Refer to Activities 2, 3 and 4 from the Learning activities on pages 238–239.

Pupil Book 4B: – Page 17: Multiplication using the formal written method

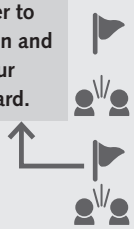
Progress Guide 4: – Support: Year 4, Unit 6, Week 1, Lesson 2: Multiplication using the formal written method

Plenary

Resources

mini whiteboard, pen and eraser (per child)

Say: **Choose another method of working out the answer to this calculation and write it on your mini whiteboard.**



- Reinforce the compact method of multiplication taught in the lesson. Write various calculations on the board and ask children to write the approximate answer on their mini whiteboard, for example, 73 × 3 (210); 33 × 8 (240); 69 × 8 (560). Display when indicated.
- Ask: **How did you work out the approximate answer?**
- Choose one of the calculations for children to find the answer.
- Say: **Explain to your partner how you would work out the answer to this question using the compact method on your mini whiteboard.**
- Ask: **Can you explain your method of working out the answer to the class?**
- Say: **Share and explain your method with your partner.**
- Choose individuals to share their methods with the class.
- Repeat with other examples.

Overcoming Barriers

- Some pupils may become confused with the number of different methods there are for working out TO × O calculations. You may prefer to teach one method only or allow children to choose the method they find the easiest. Children are taught formal methods of calculating TO × O in readiness for calculations involving larger numbers, so it is important they are taught compact methods. If they make consistent errors with these methods, they should return to informal methods until they have a greater understanding of the processes involved. It is also important at this stage that children are working towards being able to carry out TO × O calculations mentally.