Multiplication TO x 0 using the most efficient method

National Curriculum attainment target

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

Previous related lessons

Unit 4, Week 2, Lesson 2; Unit 6, Week 1, Lesson 2 Prerequisites for learning

Pupils need to:

- recall the multiplication tables up to 12×12
- 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)

Lesson objectives

- \bullet Use the most efficient method to calculate TO \times O
- Estimate and check the answer to a calculation

Future related lesson

Unit 10, Week 1, Lesson 3 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 12×12 and multiply all by a multiple of 10



Connect Year 4, Unit 6,

Week 1

Getting Started

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

Teach

Resources

prepared calculation cards (per class), bag (per class), mini whiteboard, pen and eraser (per child)

In this lesson only the second number is partitioned and the empty number line is used. Another strategy for adding two-digit numbers is to partition both numbers, then add the tens and ones then recombine. Record this without the empty number line.

- Prepare a selection of large cards with TO \times O calculations which include number sentences requiring both mental and written calculation, for example, 33 \times 3, 42 \times 3, 55 \times 4, 62 \times 3, 76 \times 8, 89 \times 7, 67 \times 8. Place them in a bag.
- Ask a child to select a calculation card from the bag. Display the card, for example, 33×3 .
- Ask: What is the answer to this calculation? (99). How did you work it out? Stress the fact that this is an easy calculation to work out mentally and would not need a written method.
- Select another card from the bag, for example, 76×8 .
- Ask: Is it easy to calculate the answer to this quickly in our head? Say: Some calculations take a bit longer to work out and may need a written method of working.
- Ask: What would the approximate answer be to this calculation? (640)
- Say: Explain to your partner how you worked out the answer to this calculation.
- Share children's strategies with the class.
- Review how to multiply these numbers using the efficient compact method:

Н	T 7	0
x	/	8
6	0	8
	4	

If the answer to the calculation is easy to work out mentally, it will not be necessary to find the approximate answer.

Some children will be able to work this out mentally. Encourage them to do so. Some children will require the support of a written method. Use the method they are most familiar with, but the aim is to use the compact method of multiplying as follows.

Some children may still not know a particular set of multiplication tables thoroughly or may not be choosing the most efficient method of working. Using the whiteboards gives you an opportunity to identify these children for further support.



- Say: We start by multiplying the numbers in the ones column. Ask: What is 6 multiplied by 8? (48) Say: 48 is 4 tens and 8 ones. We write the 8 in the ones column and add the 40 or 4 tens after we have calculated 70 multiplied by 8. To remind us to add the 4 tens, we write a small 4 in the tens column just below the answer.
- Ask: How do we record the answer to 6 × 8 in this calculation? Why don't we write the 4 tens in the answer column?
- Ask: What is 70 multiplied by 8? (560) Say: 560 add the 40 from the previous calculation gives a total of 600. Record this in the correct position giving a total of 608.
- Compare the answer with the estimate.
- Repeat with other calculation cards.
- Children record their working out on their mini whiteboard or on paper.
- Say: Explain to your partner how you worked out the answer to this calculation.
- Continue with other examples until you feel the majority of the children have understood the strategies or methods involved.
- Say: Explain how you worked out the answer to this calculation.

Individualised Learning

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

Pupil Book 4B: – Page 18: Multiplication using the most efficient method

 Resources: 1–9 dice (per pair)

 Progress Guide 4: – Support: Year 4, Unit 6, Week 1, Lesson 3: Multiplication using the most efficient method

 Extension: Year 4, Unit 6, Week 1, Lesson 3: Multiplication using the most efficient method

Plenary

Resources

Mini whiteboard, pen and eraser (per child)

• Reinforce the fact that the children should be able to identify calculations that are easier calculated mentally than by using a written method, for example, 22×4 . Use the calculations cards from the lesson or write various calculations on the board and ask children to work out the answer on their mini whiteboard. They can use either a mental or written strategy, for example, 47×3 (141); 76×5 (380); 82×4 (328). Display when indicated.



Say: Work out the answers with a partner at various intervals.
Ask: How did you work out the answer? Explain the strategy you used.

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- Some children may become confused w
- Some children may become confused with the number of different methods there are to work out the answer to $TO \times O$ 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 $TO \times O$ in readiness for calculations involving larger numbers so it is important they are taught efficient 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 $TO \times O$ calculations mentally.