

Multiplying decimals by a two-digit number using the grid method

National Curriculum attainment targets

- Multiply numbers with up to two decimal places by two-digit whole numbers
- Use estimation to check answers to calculations

Lesson objectives

- Multiply one-digit numbers with up to two decimal places by two-digit whole numbers, e.g. 7.56×34 , using the grid method
- Estimate and check the answer to a calculation

Previous related lessons

Unit 6, Week 2, Lesson 2

Prerequisites for learning

Pupils need to:

- recall the multiplication tables up to 10×10
- understand the effect of multiplying a number by a multiple of ten and one hundred including decimals
- partition decimal numbers
- add decimal numbers

Vocabulary

multiple, multiplied by, multiplication, estimate, approximate, partition, ten thousand, thousand, hundred, ten, one

Future related lessons

Unit 10, Week 1, Lesson 2; Unit 10, Week 1, Lesson 3; Unit 10, Week 1, Lesson 4

Success criteria

Pupils can:

- partition three-digit numbers into tens, ones, tenths and/or hundredths
- recall all the multiplication and division facts up to the 10×10 multiplication table
- multiply a one-digit number with up to two decimal places by a two-digit number
- make a reasonable estimate for the answer to a calculation



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*.

Collins
Connect
Year 6, Unit 10,
Week 1

Teach

- Write a multiplication calculation on the board, e.g. $2.64 \times 38 =$
- Ask: **Is this calculation easy to work out mentally?** (no) **We will partition the numbers and use the grid method to work out the answer to this calculation.**
- Say: **Discuss with your partner how to work out the approximate answer to this calculation.**
- Share ideas with the class.
- Say: **To find an approximate answer, we round 2.64 to the nearest whole number, i.e. 3, and round 38 to the nearest ten, i.e. 40, and multiply together. The answer to 3×40 is 120. When we calculate the answer we must check that it is close to our approximate answer, 120.**
- Ask: **How can we partition 2.64 and 38?**
- Demonstrate how to multiply these numbers using partitioning and the grid method, i.e.

$$\begin{array}{r}
 2.64 \times 38 \\
 \times \quad 2 \quad 0.6 \quad 0.04 \\
 \hline
 30 \quad \boxed{60} \quad \boxed{18} \quad \boxed{1.2} \quad 79.20 \\
 8 \quad \boxed{16} \quad \boxed{4.8} \quad \boxed{0.32} \quad + 21.12 \\
 \hline
 100.32 \\
 \hline
 1
 \end{array}$$

- Say: **2.64 multiplied by 38 can be partitioned into 2 multiplied by 30, 0.6 multiplied by 30 and 0.04 multiplied by 30. We then add 2 multiplied by 8, 0.6 multiplied by 8 and 0.04 multiplied by 8. Ask for the answers to each individual calculation, then add the three calculations from each horizontal row together.**
- Ask: **What is 60 add 18 add 1.2? (79.2) What is 16 add 4.8 add 0.32? (21.12)**



i Some children will notice that 2.64 is close to mid-way between two and three and may be able to get a closer approximation by calculating both 2.5 times forty mentally to get an answer of 100.



- Say: **Now we add 79.2 and 21.12 together to find the total. The answer is 100.32.**
- Say: **Now we can check if our answer is close to our estimate, i.e. 120 is close to 100.32 so the answer is likely to be correct.**
- Write another calculation on the board, e.g. $6.47 \times 58 =$
- Ask: **What would the approximate answer to this calculation be?**
- Say: **Explain to your partner how you would work out the approximate answer to this question.**
- Ask pairs to share their explanations with the class.
- Write the estimate on the board. ($6 \times 60 = 360$)
- Say: **Explain to your partner how you would work out the answer to this question.**
- Ask children to share their explanations with the class.
- Write the calculation on the board as outlined in the previous example. Compare the answer with the estimate.

$$6.47 \times 58 =$$

×	6	0.4	0.07	
50	300	20	3.5	323.20
8	48	3.2	0.56	+ 51.76
				375.26

- Compare the answer with the estimate.
- Continue with other examples until you feel the majority of the children have understood the method, e.g. 3.45×27 , 5.42×43 , 4.67×36 .

Individualised Learning

Refer to Activities 1, 2, 3 and 4 from the Learning activities on pages 392–393.

Pupil Book 6C – Page 28: Multiplying decimals by a 2-digit number using the grid method

Progress Guide 6 – Support, Year 6, Unit 7, Week 1, Lesson 1: Multiplying decimals by a 2-digit number using the grid method

Plenary

Resources

mini whiteboard, pen and eraser (per child)



- Reinforce the grid method taught in the lesson. Write various calculations on the board and ask children to write the approximate answer on their mini whiteboard, e.g. 3.27×35 (120); 1.76×53 (100); 2.58×49 (150).
- Ask: **How did you work out the approximate answer?**
- Choose a couple of the calculations for children to find the answer to.
- Say: **Explain to your partner how you would work out the answer to this question using the grid method on your mini whiteboard.**
- Ask children to share their explanations with the class.

Overcoming Barriers

- Some children may become confused with the number of different methods there are to work out the answer to calculations involving decimals. You may prefer to teach one method only or allow children to choose the method they find the easiest.
- It is important that children understand what decimals are and recognise the value of decimal numbers and do not just complete calculations as procedures.