CENTRES FOR EXCELLENCE IN MATHS

FE centre resource

Pearson

Lesson plan

Multiplication and estimation

1. Lesson objectives

- Explore, evaluate and select different representations for multiplication
- Apply various methods and representations to a singular context using integers and decimals
- Apply efficient mastery methods to questions in different contexts
- Apply estimation, inversion and rounding in order to check accuracy of answers

2. Functional Skills Level 1 curriculum

Using numbers and the number system
3 multiply whole numbers and decimals by 10, 100, 1000
11 multiply decimals up to two decimal places
12 approximate by rounding to a whole number or to one or two decimal places

3. Lesson plan

This is an overview of the lesson. More notes can be found in the notes in the lesson slides.

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Introduction	Hook: Discussion about why we need multiplication	10	Share objectives and emphasise the exploration and application. Vocabulary and method check: Introduce the topic and get learners thinking about vocabulary and methods they currently use. Discuss prior knowledge relating to multiplication. Discussion about why we need multiplication. Slide 5: True or false quiz based around common misconceptions, e.g. not putting the zero to signify 10×/100×, or adding up left to right instead of right to left. All multiplication makes a bigger answer (decimal multiplication makes the answer smaller) OPTIONAL TASK: Slide 6: Tutors decide if learners are able to attempt these more challenging questions in the same format.	Slides 1–6 Mini whiteboards
Explore 1	Knowledge identification / development of understanding behind the methods	15	Place value activities – to explore place value using tiles. 1. Lead a classroom discussion on how to multiply 341 by 2 using knowledge of place value (2 of 300 and 2 of 40 and 2 of 1). 2. Demonstrate both ways to arrive at the answer (by repeated addition or multiplication). 3. Move on to 341 × 6 and 341 × 13, and explore how decomposing a number by place value can help understand the calculation.	Slides 7–11 Place value cards Mini whiteboards

Activity	Purpose of this activity	Time (min)	Guidance	Materials
			4. Finish with Slide 11 and a discussion about multiplying by 10 and 100.	
Explore 2	Appreciate how multiplication can be represented in different ways	15	What is multiplication? Display the picture with an array of circles on Slide 12. Ask learners for methods to work out how many circles without counting (e.g. 5 × 10 versus 10 × 5, both equal 50). Ask learners for alternative strategies to counting. Another model Develop the array model (discrete modelling) to an area model (continuous quantity modelling) to represent questions that involve decimal numbers. Note: Use examples to make sensible estimation check of the area (e.g. 2 × 3.4 ≈ 2 × 3 = 6, 4.6 × 7.3 ≈ 5 × 7 = 35). Ignore units for purposes of simplicity/distraction. Rounding check Discuss with learners what a rounding check is, what a sensible answer means, and how to carry out checks. Use rounding and estimation checks to consolidate understanding.	Slides 12–18

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Explore 3	Consolidate learners understanding of how to round decimals to the nearest integer and to 1 decimal place	15	Tutor leads a discussion to consolidate understanding of rounding rules, followed by discussion about appropriate levels of accuracy and clarify the difference between rounding to a significant figure versus rounding to a particular place value. An example is then presented on how to use rounding in multiplication to predict sensible answers. Activity 1: Learners randomly select place value cards and create two pairs of two-digit numbers, then round and predict the answers prior to checking with the calculator to confirm that the place values of both answers agree. The activity is repeated with decimals included. Activity 2: Use the questions on Slide 23 for learners to consolidate their skills of rounding and estimating.	Slides 19–23 Place value cards Estimation handout
Practice	Practise/consolidate prior learning	15	Worded questions to be completed by learners. Ask learners to estimate answers first, then carry out exact calculations and compare their answers.	Slide 24 Worded questions handout
Discuss	Appreciate and select a method	10	Learners are asked to reflect on the different models and methods they have used, which they like best, and whether they might use different models and methods for different situations. They then consider how many ways they can come up with to multiply 1650 by 19.	Slides 25–26
Practice questions	Consolidate learning	5	Level 1 exam questions to enable learners to practise their multiplication skills within worded problems. Answers can be revealed by animation and discussed.	Slides 27–28

Activity	Purpose of this activity	Time (min)	Guidance	Materials
				Handout Exam Questions
Review	To summarise the key learning points	5	Review the learning objectives for the lesson. • Do learners feel more confident tackling multiplication questions now? • Do they think they understand better how multiplication methods work? • What sorts of questions do they need more practice with?	Slide 29