

9 CALCULATION: MULTIPLICATION

LEARNING OBJECTIVES

- To multiply numbers mentally, drawing upon known facts
- To multiply numbers up to 4 digits by a 1-digit or 2-digit number using a formal written method, including using long multiplication for 2-digit numbers

CONTENT DOMAINS

- C6 multiply mentally
- C7 multiply using written methods

STARTER ACTIVITIES

- **Powers of 10; 5 minutes; page 66**
Remind the student about moving digits to the left when multiplying by 10, 100 and 1,000. Use the place-value grid at the top of the activity sheet to demonstrate this, starting with the number 67 and multiplying it by 10 (670), so that the student can see the digits moving to the left and zero being used to fill the gaps. Ask the student to complete the activity sheet.

MAIN ACTIVITIES

- **Multiplying mentally; 10 minutes**
Remind the student about using times-tables and their knowledge of doubling to help them multiply large numbers mentally, e.g. to work out 34×20 , double 34 and multiply the answer by 10 (680). Give the student a pack of 0–9 digit cards and ask them to generate their own 2-digit numbers and multiply these by 2, 200 or 2,000. Check they are using the method correctly.
- **Short multiplication; 15 minutes; page 67**
Recap short multiplication, using the prompt on the sheet. Ensure the student is lining up the digits correctly and working from right to left to solve the calculations.
- **Long multiplication; 15 minutes; page 68**
Recap long multiplication, using the prompt on the sheet. Ensure the student is lining up the digits correctly and working from right to left to solve the calculations. Check the student is confident in knowing when to use each method (short or long multiplication).

PLENARY ACTIVITY

- **Which method to use?; 5 minutes**
Show these calculations to the student and ask them to identify whether they would use mental, long or short multiplication to solve them, explaining the reason for their choice:
 67×100 (mental) 690×74 (long) 487×9 (short) 543×78 (long) 88×20 (mental)

HOMEWORK ACTIVITIES

- **Multiplication methods; 20 minutes; page 69**
Full instructions are given on the activity sheet.

DIFFERENTIATION AND EXTENSION IDEAS

- **Multiplying mentally** Extend by asking the student to generate 3-digit numbers and multiply them by different numbers e.g. 4 (double and double again).
- **Short multiplication** Support by first asking the student to multiply a 2-digit number by a 1-digit number so they can become confident with the method, then move on to multiplying 3-digit numbers by 1-digit numbers. Extend by asking the student to multiply 5-digit numbers by a 1-digit number.
- **Long multiplication** Support by first asking the student to multiply a 2-digit number by a 2-digit number so they can become confident with the method, then move on to those on the activity sheet. Extend by asking the student to multiply 4-digit numbers by a 2-digit number.

PROGRESS AND OBSERVATIONS

STARTER ACTIVITY: POWERS OF 10

TIMING: 5 MINS

LEARNING OBJECTIVES

- To multiply numbers mentally, drawing upon known facts

EQUIPMENT

none

one millions	hundred thousands	ten thousands	one thousands	hundreds	tens	units		tenths	hundredths	thousandths
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Use the place-value table to help you complete these multiplications.

1. $67 \times 10 =$ 2. $39 \times 100 =$

3. $86 \times 1,000 =$ 4. $40 \times 10 =$

5. $601 \times 10 =$ 6. $90 \times 100 =$

7. $100 \times 1,000 =$ 8. $1,345 \times 10 =$

9. $3,580 \times 100 =$ 10. $4,030 \times 1,000 =$

MAIN ACTIVITY: SHORT MULTIPLICATION

TIMING: 15 MINS

LEARNING OBJECTIVES

- To multiply numbers up to 4 digits by a 1-digit or 2-digit number using a formal written method, including using long multiplication for 2-digit numbers

EQUIPMENT

none

When multiplying a number by a 1-digit number, you can use a written method called 'short multiplication'. As with addition and subtraction, you must line up the digits and work from right to left to solve the calculation.

Example:

Start with 2×8
Write the 1 under the 10s column and the 6 in the 1s column of the answer.

Remember to put a working-out line under the answer to carry digits.

Working across, multiply each digit by 8
Remember to add on the carried digits.

1. Use this method to solve these multiplications. Show your working out on a separate piece of paper.

a) $1,275 \times 4 =$

b) $3,045 \times 8 =$

c) $5,704 \times 6 =$

d) $3,139 \times 9 =$

2. Now solve these problems. Show your working out on a separate piece of paper

a) A delivery company uses 9,814 litres of fuel in a day. How many litres of fuel will it use in five days?

b) One large sack of grain can feed 8,043 pigeons. How many pigeons can be fed using 7 large sacks of grain?

TIMING: 15 MINS

EQUIPMENT

- none

Example:

[illegible]

Remember to add any carried digits at each stage of the multiplication.

d) $519 \times 58 =$

b) A caterer charges £79 for a five-course meal. How much will they charge to supply five-course meals to 904 people?

HOMEWORK ACTIVITY: MULTIPLICATION METHODS

TIMING: 20 MINS

LEARNING OBJECTIVES

- To multiply numbers mentally, drawing upon known facts
- To multiply numbers up to 4 digits by a 1-digit or 2-digit number using a formal written method, including using long multiplication for 2-digit numbers

EQUIPMENT

none

1. Use mental methods to calculate the answers to these multiplications.

- a) $678 \times 10 =$ b) $823 \times 100 =$
- c) $956 \times 1,000 =$ d) $83 \times 2 =$
- e) $28 \times 20 =$ f) $99 \times 200 =$

2. Use short multiplication to solve these multiplications. Show your working out on a separate piece of paper.

- a) $1,498 \times 3 =$ b) $4,765 \times 6 =$
- c) Pencils come in boxes of 7. How many pencils will there be in 7,021 boxes?

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- d) Chocco Biccós are sold in packs of 9. How many Chocco Biccós will there be in 4,867 packs?

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3. Use long multiplication to solve these multiplications. Show your working out on a separate piece of paper.

- a) $24 \times 19 =$ b) $376 \times 33 =$
- c) There are 587 plastic sacks in a jumbo pack. How many plastic sacks will there be in 57 jumbo packs?

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- d) A lap around a race track is 88 metres long. How many metres will Seb run if he completes 876 laps?

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9 ANSWERS

STARTER ACTIVITY: POWERS OF 10

- | | | | | |
|----------|------------|-----------|------------|---------------|
| 1. 670 | 2. 3,900 | 3. 86,000 | 4. 400 | 5. 6,010 |
| 6. 9,000 | 7. 100,000 | 8. 13,450 | 9. 358,000 | 10. 4,030,000 |

MAIN ACTIVITY: SHORT MULTIPLICATION

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|--------------|-----------|-----------|-----------|
| 1. a) 5,100 | b) 24,360 | c) 34,224 | d) 28,251 |
| 2. a) 49,070 | b) 56,301 | | |

MAIN ACTIVITY: LONG MULTIPLICATION

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|--------------|------------|-----------|-----------|
| 1. a) 3,105 | b) 8,118 | c) 13,172 | d) 30,102 |
| 2. a) 75,432 | b) £71,416 | | |

HOMEWORK ACTIVITY: MULTIPLICATION METHODS

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|-------------|-----------|------------|-----------|--------|-----------|
| 1. a) 6,780 | b) 82,300 | c) 956,000 | d) 166 | e) 560 | f) 19,800 |
| 2. a) 4,494 | b) 28,590 | c) 49,147 | d) 43,803 | | |
| 3. a) 456 | b) 12,408 | c) 33,459 | d) 77,088 | | |