

# Reasoning and Problem Solving

## Step 4: Multiply 3-Digits by 2-Digits

### National Curriculum Objectives:

Mathematics Year 5: (5C6a) [Multiply and divide numbers mentally drawing upon known facts](#)

Mathematics Year 5: (5C7a) [Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers](#)

### Differentiation:

Questions 1, 4 and 7 (Reasoning)

**Developing** Calculate area by multiplying 3-digits by 2-digits (up to 30). No exchanges.

**Expected** Calculate area by multiplying 3-digits by 2-digits (up to 50). Up to one exchange per calculation.

**Greater Depth** Calculate area by multiplying 3-digits by 2-digits (up to 99). One or more exchanges per calculation.

Questions 2, 5 and 8 (Problem Solving)

**Developing** Solve a word problem by multiplying 3-digits by 2-digits (up to 30). No exchanges.

**Expected** Solve a word problem by multiplying 3-digits by 2-digits (up to 50). Up to one exchange per calculation.

**Greater Depth** Solve a word problem by multiplying 3-digits by 2-digits (up to 99). One or more exchanges per calculation.

Questions 3, 6 and 9 (Reasoning)

**Developing** Identify whether a statement is correct by multiplying 3-digits by 2-digits (up to 30). No exchanges.

**Expected** Identify whether a statement is correct by multiplying 3-digits by 2-digits (up to 50). Up to one exchange per calculation.

**Greater Depth** Identify whether a statement is correct by multiplying 3-digits by 2-digits (up to 99). One or more exchanges per calculation.

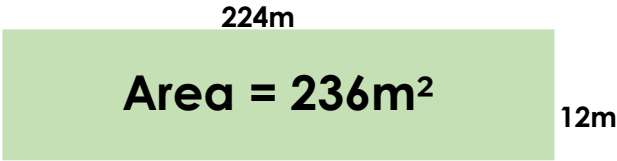
More [Year 5 Multiplication and Division](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

Multiply 3-Digits by 2-Digits

Multiply 3-Digits by 2-Digits

1a. The members of a gardening club work out the area of new allotments. They do the calculation  $224 + 12$ . Explain their mistake.

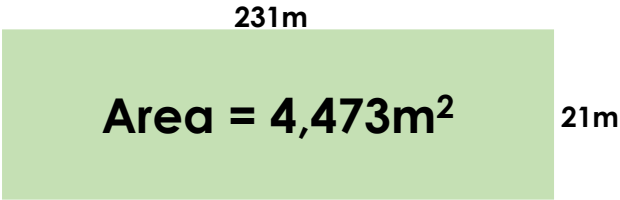


What is the correct area of the allotments?



R

1b. A conservationist works out the area of a reserve. She does the calculation  $213 \times 21$ . Explain her mistake.



What is the correct area of the reserve?



R

2a. A headteacher wants to work out the cost of three school trips taken this year.

| Destination | Number of pupils | Price per ticket (£) |
|-------------|------------------|----------------------|
| Museum      | 145              | 11                   |
| Castle      | 513              | 13                   |
| Theatre     | 201              | 23                   |

What was the total cost for each destination?



PS

2b. A catering company want to work out their profit from three events this year.

| Event      | Number of guests | Profit per guest (£) |
|------------|------------------|----------------------|
| Wedding    | 302              | 13                   |
| Party      | 712              | 12                   |
| Graduation | 123              | 21                   |

How much money did the company make from each event?



PS

3a.

I think that  $12 \times 300$  is bigger than  $121 \times 30$ .

Ryan

Suki

I think that  $121 \times 30$  is bigger than  $12 \times 300$ .

Who is correct? How do you know?



R

3b.

I think that  $12 \times 220$  is bigger than  $122 \times 22$ .

Denise

Fraser

I think that  $122 \times 22$  is bigger than  $12 \times 220$ .

Who is correct? How do you know?

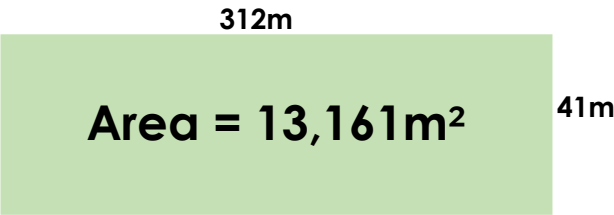


R

Multiply 3-Digits by 2-Digits

Multiply 3-Digits by 2-Digits

4a. A farmer wants to work out the area of his land. He does the calculation  $41 \times 321$ . Explain his mistake.

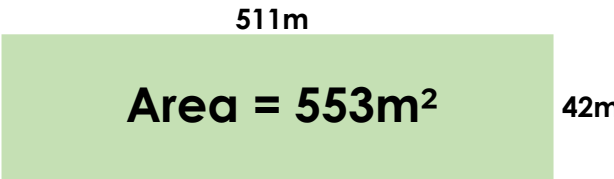


What is the correct area of his land?



R

4b. Year 4 want to work out the area of their playing field. They do the calculation  $42 + 511$ . Explain their mistake.



What is the correct area of the playing field?



R

5a. An airline wants to identify which flight was most profitable last week.

| Destination | Number of passengers | Profit per ticket (£) |
|-------------|----------------------|-----------------------|
| Paris       | 301                  | 34                    |
| Budapest    | 102                  | 47                    |
| Berlin      | 504                  | 21                    |

How much money did they make from each flight?



PS

5b. A supermarket is checking its stock of vegetables.

| Type of vegetable | Weight in each bag (g) | Number of bags |
|-------------------|------------------------|----------------|
| Carrots           | 420                    | 21             |
| Celery            | 250                    | 31             |
| Tomatoes          | 310                    | 15             |

What is the total weight of each type of vegetable?



PS

6a.

I think that  $16 \times 510$  is bigger than  $161 \times 50$ .



Sammy



Lauren

I think that  $161 \times 50$  is bigger than  $16 \times 510$ .

Who is correct? How do you know?



R

6b.

I think that  $14 \times 300$  is bigger than  $141 \times 30$ .



Milly



Omar

I think that  $141 \times 30$  is bigger than  $14 \times 300$ .

Who is correct? How do you know?

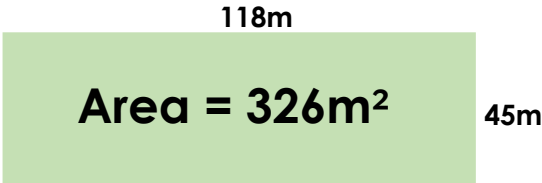


R

Multiply 3-Digits by 2-Digits

Multiply 3-Digits by 2-Digits

7a. A football club work out the area of a new pitch. They do the calculation  $118 + 118 + 45 + 45$ . Explain their mistake.

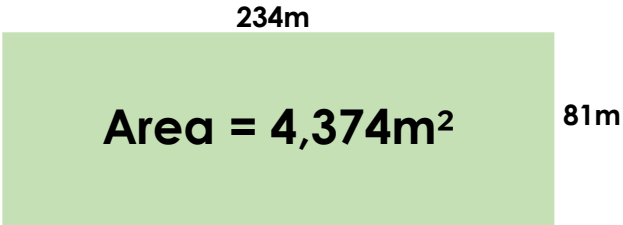


What is the correct area of the pitch?



R

7b. An umpire works out the area of three tennis courts. He does the calculation  $243 \times 18$ . Explain his mistake.



What is the correct area of the courts?



R

8a. The table below records the number of spectators at Olympic events and the price they each paid for a ticket.

| Event    | Number of spectators | Price per ticket (£) |
|----------|----------------------|----------------------|
| Swimming | 415                  | 63                   |
| Hurdles  | 832                  | 52                   |
| Archery  | 105                  | 88                   |

How much money did each event make in ticket sales?



PS

8b. The table below records the number of passengers on three train journeys and the price they each paid for a ticket.

| Destination | Number of passengers | Price per ticket (£) |
|-------------|----------------------|----------------------|
| Newcastle   | 325                  | 41                   |
| Penzance    | 224                  | 35                   |
| Edinburgh   | 112                  | 92                   |

What was the total cost of tickets for each destination?



PS

9a.

I think that  $21 \times 291$  is bigger than  $211 \times 29$ .



Ben



Lara

I think that  $211 \times 29$  is bigger than  $21 \times 291$ .

Who is correct? How do you know?



R

9b.

I think that  $13 \times 370$  is bigger than  $131 \times 37$ .



Joseph



Jessica

I think that  $131 \times 37$  is bigger than  $13 \times 370$ .

Who is correct? How do you know?



R

## Reasoning and Problem Solving

### Multiply 3-Digits by 2-Digits

#### Developing

1a. They should have multiplied the numbers rather than adding them.

$$224 \times 12 = 2,688\text{m}^2$$

2a. Museum: £1,595; Castle: £6,669

Theatre: £4,623

3a. Suki is correct.

$$300 \times 12 = 3,600; 121 \times 30 = 3,630$$

#### Expected

4a. He has multiplied the wrong numbers.

$$312 \times 41 = 12,792\text{m}^2$$

5a. Paris: £10,234; Budapest: £4,794

Berlin: £10,584

6a. Sammy is correct.

$$16 \times 510 = 8,160; 161 \times 50 = 8,050$$

#### Greater Depth

7a. They have worked out the perimeter, not the area.  $118 \times 45 = 5,310\text{m}^2$

8a. Swimming: £26,145; Hurdles: £43,264

Archery: £9,240

9a. Lara is correct.

$$21 \times 291 = 6,111; 211 \times 29 = 6,119$$

## Reasoning and Problem Solving

### Multiply 3-Digits by 2-Digits

#### Developing

1b. She has multiplied the wrong numbers.

$$231 \times 21 = 4,851\text{m}^2$$

2b. Wedding: £3,926; Party: £8,544

Graduation: £2,583

3b. Fraser is correct.

$$220 \times 12 = 2,640; 122 \times 22 = 2,684$$

#### Expected

4b. They should have multiplied the numbers rather than adding them.

$$511 \times 42 = 21,462\text{m}^2$$

5b. Carrots: 8,820g; Celery: 7,750g

Tomatoes: 4,650g

6b. Omar is correct.

$$14 \times 300 = 4,200; 141 \times 30 = 4,230$$

#### Greater Depth

7b. He has multiplied the wrong numbers.

$$234 \times 81 = 18,954\text{m}^2$$

8b. Newcastle: £13,325; Penzance: £7,840

Edinburgh: £10,304

9b. Jessica is correct.

$$13 \times 370 = 4,810 \text{ and } 131 \times 37 = 4,847$$