# Reasoning and Problem Solving
# Step 3: Multiply 2 Digits by 2 Digits

**Teaching note: We have included grids for column multiplication and recommend that this resource is printed in colour or greyscale.**

## National Curriculum Objectives:

**Mathematics Year 5: (5C6a) Multiply and divide numbers mentally drawing upon known facts**
**Mathematics Year 5: (5C6b) Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000**
**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 (Problem Solving)**
**Developing Create possible multiplications using numbers using the fully expanded method with no exchanges.**
**Expected Create possible multiplications using formal multiplication method including exchanges.**
**Greater Depth Create possible multiplications using formal multiplication method including exchanges where the numbers in the questions are incomplete.**

**Questions 2, 5 and 8 (Problem Solving)**
**Developing Find the possible numbers using the given statements. Will require use of the fully expanded method with no exchanges.**
**Expected Find the possible numbers using the given statements. Will require use of formal multiplication method. Use of zero as a place holder and including exchanges.**
**Greater Depth Find the possible numbers using the given statements. Will require use of formal multiplication method including exchanges where the numbers in the questions are incomplete.**

**Questions 3, 6 and 9 (Reasoning)**
**Developing Explain whether a multiplication calculation is correct, using the fully expanded method with no exchanges.**
**Expected Explain whether a multiplication calculation is correct, using formal multiplication method including exchanges.**
**Greater Depth Explain whether a multiplication calculation is correct, using formal multiplication method including exchanges where the numbers in the questions are incomplete.**

## More Year 5 Multiplication and Division resources.

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



**classroomsecrets.co.uk**

# Multiply 2 Digits by 2 Digits

## 1a. Multiply 2 digits by 2 digits using the cards below to create an odd number.

x

| | | | | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

5 1 2 3

D PS

## 1b. Multiply 2 digits by 2 digits using the cards below to create an even number.

x

| | | | | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

4 3 1 2

D PS

## 2a. Anaya is thinking of a number...

I multiply the number by 15. The answer is odd and is greater than 305 but smaller than 345.

What could Anaya's number be?

D PS

## 2b. Tomas is thinking of a number...

I multiply the number by 22. The answer is less than 400 but greater than 350.

What could Tomas's number be?

D PS

## 3a. Zayn solves the following multiplication.

| | | | | | |
|---|---|---|---|---|---|
| | | | 2 | 6 | |
| x | | | 2 | 1 | |
| | | | | 6 | (1 x 6) |
| | | | 2 | 0 | (1 x 20) |
| | | 1 | 2 | 0 | (20 x 6) |
| | | | 4 | 0 | (20 x 20) |
| | | 1 | 8 | 6 | |

Is he correct? Explain your answer.

D R

## 3b. Faith solves the following multiplication.

| | | | | | |
|---|---|---|---|---|---|
| | | | 2 | 3 | |
| x | | | 1 | 7 | |
| | | | 2 | 1 | (7 x 3) |
| | | 1 | 4 | 0 | (7 x 20) |
| | | | | 3 | (10 x 3) |
| | | 2 | 0 | 0 | (10 x 20) |
| | | 3 | 6 | 4 | |

Is she correct? Explain your answer.

D R

# Multiply 2 Digits by 2 Digits

## 4a. Multiply 2 digits by 2 digits using the cards below to create an odd number.

| | | | | |
|---|---|---|---|---|
| | | | | |
| x | | | | |
| | | | | |
| | | | | |
| | | | | |

2 5 7 1

E PS

## 4b. Multiply 2 digits by 2 digits using the cards below to create an even number.

| | | | | |
|---|---|---|---|---|
| | | | | |
| x | | | | |
| | | | | |
| | | | | |
| | | | | |

3 6 4 8

E PS

## 5a. Xavier is thinking of a number...

I multiply the number by 33. The answer is even and is greater than 650 but smaller than 750.

What could Xavier's number be?
Find all the possibilities.

E PS

## 5b. Aimee is thinking of a number...

I multiply the number by 41. The answer is odd and is less than 700 but greater than 600.

What could Aimee's number be?
Find all the possibilities.

E PS

## 6a. Terry solves the following multiplication.

| | | | | |
|---|---|---|---|---|
| | | | 3 | 8 |
| x | | | 2 | 6 |
| | | 2 | $2_4$ | 8 |
| | | 6 | $1_1$ | 6 |
| | | 8 | 4 | 4 |
| | | | 1 | |

Is he correct? Explain your answer.

E R

## 6b. May solves the following multiplication.

| | | | | |
|---|---|---|---|---|
| | | | 4 | 3 |
| x | | | 2 | 8 |
| | | 3 | $4_2$ | 4 |
| | | 8 | 6 | 0 |
| | 1 | 1 | 0 | 4 |
| | | | | |

Is she correct? Explain your answer.

E R

# Multiply 2 Digits by 2 Digits

7a. Use the cards below to create a 2 digit x 2 digit calculation to complete the answer shown. The cards can be used more than once.

| | | | | |
|---|---|---|---|---|
| | | | □ | □ |
| x | | | □ | □ |
| | | | | |
| | | | | |
| | 1 | 2 | □ | 8 |

2 4 6 8

GD PS

7b. Use the cards below to create a 2digits x 2 digit calculation to complete the answer shown. The cards can be used more than once.

| | | | | |
|---|---|---|---|---|
| | | | □ | □ |
| x | | | □ | □ |
| | | | | |
| | | | | |
| | 3 | □ | 1 | 5 |

3 9 5 7

GD PS

8a. Shyla is thinking of two numbers.

My first number is a multiple of 5 and 7. I multiply the number by a 2-digit odd number which is a multiple of 9. All the digits in the answer are odd.

What could Shyla's numbers be?

GD PS

8b. Ty is thinking of a number.

My first number is a multiple of 6 and 3. I multiply the number by a 2-digit odd number which is a multiple of 7. One of the digits in the answer is even.

What could Ty's numbers be?

GD PS

9a. Hallie says it is not possible to make 2,056 when multiplying a 2-digit number by 12.

| | | | | |
|---|---|---|---|---|
| | | | ? | ? |
| x | | | 1 | 2 |
| | | | | |
| | | | | |
| | 2 | 0 | 5 | 6 |

Jacy says it is.

Who is correct? Explain your answer.

GD R

9b. Jayvion says it is not possible to make 9,811 when multiplying a 2-digit number by 89.

| | | | | |
|---|---|---|---|---|
| | | | ? | ? |
| x | | | 8 | 9 |
| | | | | |
| | | | | |
| | 9 | 8 | 1 | 1 |

David says it is.

Who is correct? Explain your answer.

GD R

# Reasoning and Problem Solving
# Multiply 2 Digits by 2 Digits

## Developing

**1a.** Various answers, for example:
15 x 23 = 345; 51 x 23 = 1,173

**2a.** Various answers, for example:
21; because 21 x 15 = 315

**3a.** No, because he has worked out that 20 x 20 = 40. The correct answer is 400, making the final answer 546.

## Expected

**4a.** Various answers, for example:
25 x 71 = 1,775; 51 x 27 = 1,377

**5a.** The number could be 20 or 22:
33 x 20 = 660 or 33 x 22 = 726

**6a.** No, because the second part of the calculation is incorrect. 20 x 38 = 760 and the final answer should be 988.

## Greater Depth

**7a.**

| | | | | |
|---|---|---|---|---|
| | | | 2 | 6 |
| x | | | 4 | 8 |
| | | 2 | $0_4$ | 8 |
| | 1 | $0_2$ | 4 | 0 |
| | 1 | 2 | 4 | 8 |

**8a.** Various answers, for example:
35 x 45 = 1,575

**9a.** Hallie is correct, because the highest 2-digit number she can make is 99, which when multiplied by 12 gives the answer 1,188 which is less than 2,000.

# Reasoning and Problem Solving
# Multiply 2 Digits by 2 Digits

## Developing

**1b.** Various answers, for example:
32 x 14 = 448; 41 x 32 = 1,312;
13 x 42 = 546

**2b.** Various answers, for example:
16; because 22 x 16 = 352

**3b.** No, because she has worked out that 10 x 3 = 3. The correct answer is 30, making the final answer 391.

## Expected

**4b.** Various answers, for example:
36 x 48 = 1,728; 64 x 38 = 2,432;
43 x 68 = 2,924; 63 x 48 = 3,024

**5b.** The number could be 15 or 17.
41 x 15 = 615 or 41 x 17 = 697

**6b.** No. May has not written down the exchange when adding the tens in the answer. It should be 1,204.

## Greater Depth

**7b.**

| | | | | |
|---|---|---|---|---|
| | | | 9 | 5 |
| x | | | 3 | 7 |
| | | 6 | $6_3$ | 5 |
| | 2 | $8_1$ | 5 | 0 |
| | 3 | 5 | 1 | 5 |
| | | 1 | | |

**8b.** Various answers, for example:
18 x 21 = 378

**9b.** Jayvion is correct, because the highest 2-digit number he can make is 99, which when multiplied by 89 gives the answer 8,811 which is less than 9,000.