

# Informal written methods for multiplication

## Notes and guidance

In this small step, children use a variety of informal written methods to multiply a 2-digit number by a 1-digit number.

Children follow a clear progression of methods and representations to support their understanding. They begin by using place value charts to recognise multiples of a number and make the link to repeated addition.

The use of base 10 encourages children to partition the tens and ones and unitise the tens, laying the foundations for later work. Part-whole models are used to illustrate the informal method of partitioning. Children use number lines, along with their knowledge of multiplying by 10. For example, to work out  $32 \times 4$  they count along a number line to show  $10 \times 4 + 10 \times 4 + 10 \times 4 + 2 \times 4$ . They may also use their knowledge of factor pairs from earlier in the block to multiply.

### Things to look out for

- Children may not use the correct place value, multiplying tens as ones, for example  $34 \times 6 = 3 \times 6 + 4 \times 6$
- Children may conflate the partitioning and factorising methods, for example when calculating  $4 \times 18$ , they may do  $4 \times 9 + 4 \times 2$

## Key questions

- What is the same and what is different about multiplying by 1s and multiplying by 10s?
- How would you explain this method?
- What is the most efficient way to work out  $\_\_\_\_\_ \times \_\_\_\_\_$ ?
- How could you use a number line to work out this calculation?
- How could you use a part-whole model to partition into tens and ones?

## Possible sentence stems

- $\_\_\_\_\_$  partitioned into tens and ones is  $\_\_\_\_\_$  and  $\_\_\_\_\_$
- $\_\_\_\_\_ \times \_\_\_\_\_ = \_\_\_\_\_ \text{ tens} \times \_\_\_\_\_ + \_\_\_\_\_ \text{ ones} \times \_\_\_\_\_$   
 $= \_\_\_\_\_ \text{ tens} + \_\_\_\_\_ \text{ ones} = \_\_\_\_\_$

### National Curriculum links

- Solve problems involving multiplying and adding, including using the distributive law to multiply 2-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as  $n$  objects are connected to  $m$  objects
- Recognise and use factor pairs and commutativity in mental calculations

# Informal written methods for multiplication

## Key learning

- Aisha uses base 10 to work out  $3 \times 26$

| Tens | Ones |
|------|------|
|      |      |
|      |      |
|      |      |

$3 \times 26 = 60 + 18 = 78$

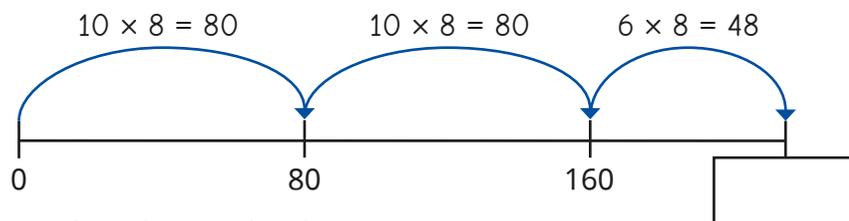
Use Aisha's method to work out the multiplications.

$3 \times 36$

$6 \times 24$

$4 \times 45$

- Teddy is using a number line to work out  $8 \times 26$



Complete the number line.

Use Teddy's method to work out the multiplications.

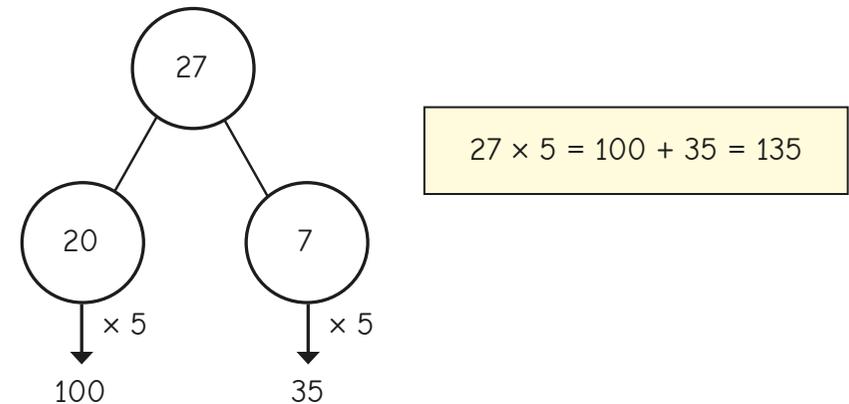
$7 \times 16$

$6 \times 34$

$4 \times 27$

- Ron is working out  $27 \times 5$

He partitions 27 into 20 and 7 and records this on a part-whole model.



Use Ron's method to work out the multiplications.

$24 \times 8$

$36 \times 4$

$56 \times 3$

- There are 7 classes in a school.

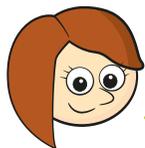
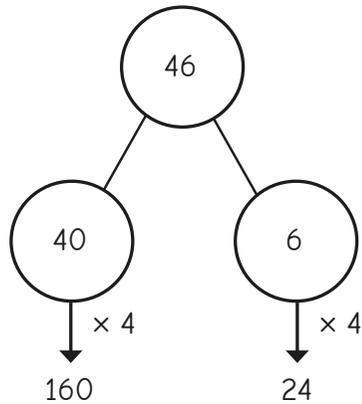
Each class has 26 children.

How many children are there altogether?

# Informal written methods for multiplication

## Reasoning and problem solving

Rosie is using a part-whole model to work out 46 multiplied by 4



$46 \times 4 = 1,624$

What mistake has Rosie made?

What is the correct answer?

She has multiplied the parts correctly, but added them up incorrectly.

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Dexter and Whitney are working out  $6 \times 14$



Dexter

I used a factor pair of 14 to help me: 2 and 7  
 $6 \times 2 = 12$   
 $12 \times 7 = 84$



Whitney

I partitioned 14 into 10 and 4  
 $6 \times 10 = 60$   
 $6 \times 4 = 24$   
 $60 + 24 = 84$

Whose method do you prefer? Why?

Use your preferred method to work out the multiplications.

$5 \times 43$

$16 \times 6$

$24 \times 3$

Talk about your methods with a partner.

215, 96, 72