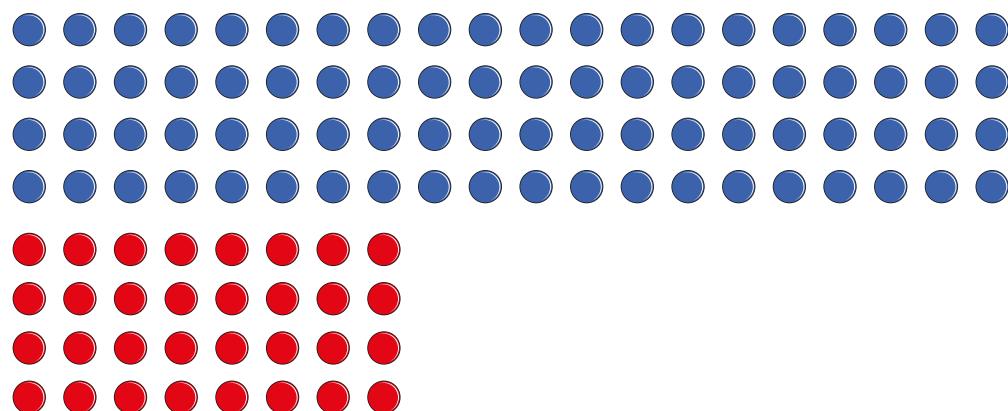


# Efficient multiplication

- 1 Class 4 are multiplying  $28 \times 4$  mentally.  
They are trying two different methods.

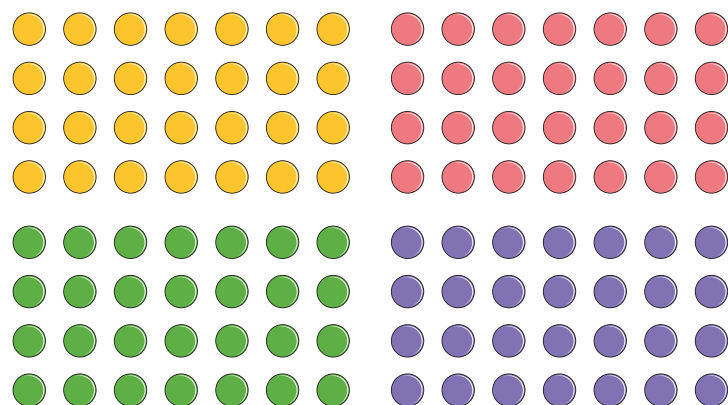
a) Complete their calculations.

Method 1



$$20 \times 4 + 8 \times 4 = \boxed{80} + \boxed{32} = \boxed{112}$$

Method 2

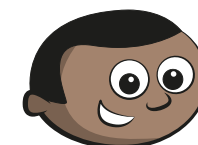


$$4 \times \boxed{28} = \boxed{112}$$

- b) Which method do you find easier?  
Talk about it with a partner.
- c) What other methods could you use to work out  $28 \times 4$ ?

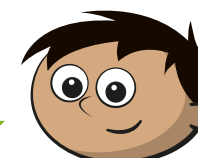
E.g.  $(4 \times 30) - (4 \times 2)$

- 2 Mo, Amir and Annie worked out  $35 \times 6$  in 3 different ways.



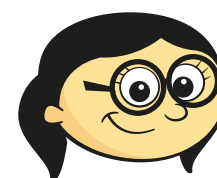
Mo

I multiplied  
30 by 6 and then added  
5 more lots of 6



Amir

I multiplied  
35 by 2, then multiplied  
that answer by 3



Annie

I multiplied  
5 by 6, then multiplied  
that answer by 7

- a) Work out the answer using each method to show that they are all correct.

Mo

$$\begin{aligned} 30 \times 6 &= 180 \\ 5 \times 6 &= 30 \\ 180 + 30 &= \underline{210} \end{aligned}$$

Amir

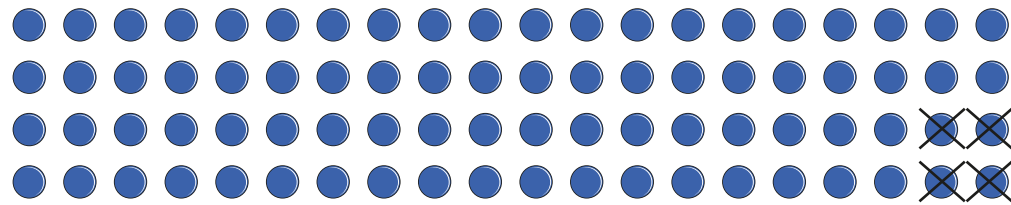
$$\begin{aligned} 35 \times 2 &= 70 \\ 70 \times 3 &= \underline{210} \end{aligned}$$

Annie

$$\begin{aligned} 5 \times 6 &= 30 \\ 30 \times 7 &= \underline{210} \end{aligned}$$

- b) Who has used the most efficient method?  
Talk about it with a partner.

- 3 Scott is working out  $21 \times 4$



$$\begin{aligned} 20 \times 4 &= 80 \\ 80 - 4 &= 76 \\ 21 \times 4 &= 76 \end{aligned}$$

- a) What mistake has Scott made?

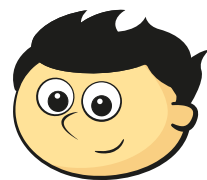
He has taken 4, he should have added it.

- b) What is the correct answer?

**84**

- 4 Jack works out  $36 \times 9$

$$\begin{aligned} 36 \times 9 \\ 36 \times (10 - 1) \\ 360 - 36 &= 324 \end{aligned}$$



Adapt Jack's method to work out  $36 \times 99$

$$36 \times 99 = \boxed{3,564}$$

- 5 Esther has found a quick way to multiply 84 by 5

$$\begin{aligned} 84 \times 5 \\ 84 \times 10 &= 840 \\ \text{(then divide by 2) which is } &420 \end{aligned}$$

Use Esther's method to complete the calculations.

$$43 \times 5 = \boxed{215}$$

$$74 \times 5 = \boxed{370}$$

$$62 \times 5 = \boxed{310}$$

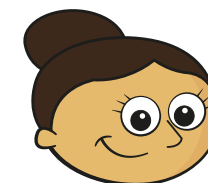
- 6 Tommy and Dora are both working out  $25 \times 8$

$$25 \times 8 = 25 \times 10 - 25 \times 2$$



- a) Use Tommy's method to work out the answer.

**200**



$$25 \times 8 = 50 \times 8 \div 2$$

- b) Use Dora's method to work out the answer.

**200**

- c) Whose method do you prefer? Why?

Various answers.

- d) Do you know another method?



# Written methods



1 Dora uses base 10 to work out  $34 \times 3$

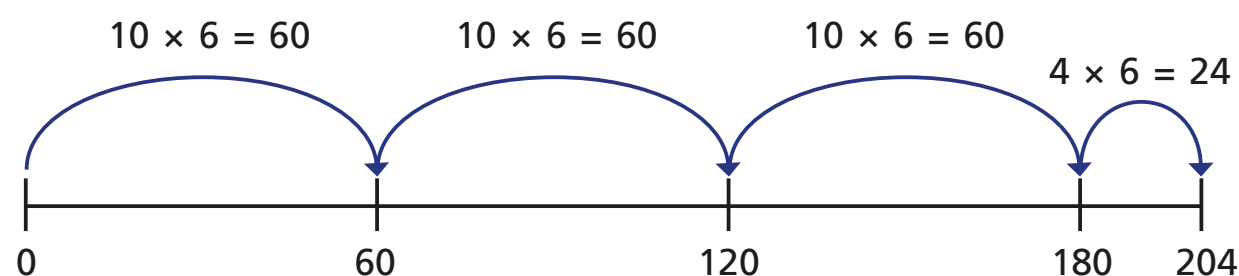
Tens	Ones

Use base 10 to work out  $3 \times 28$  and  $3 \times 36$

$$3 \times 28 = \boxed{84} \quad 3 \times 36 = \boxed{108}$$



2 Class 4 are using number lines to solve  $6 \times 34$

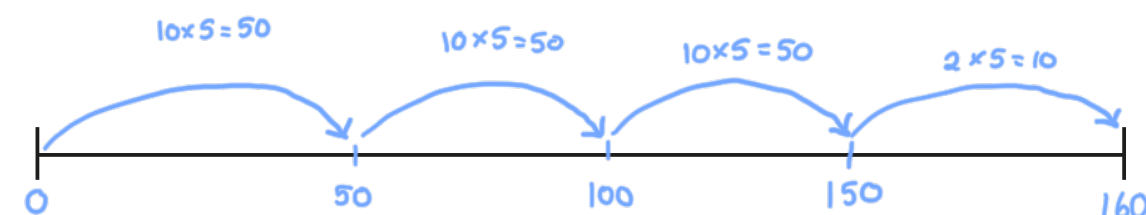


a) Talk about Class 4's method with a partner.

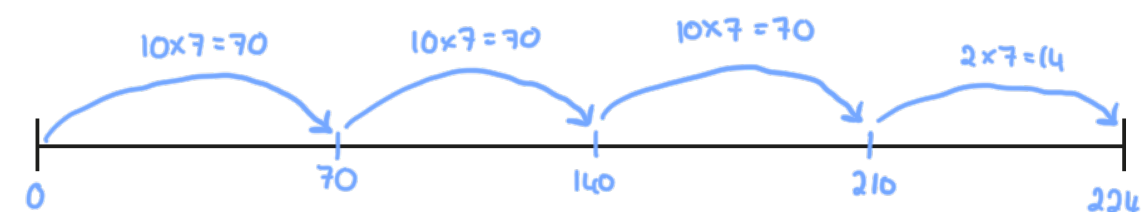


b) Use a number line to complete the multiplications.

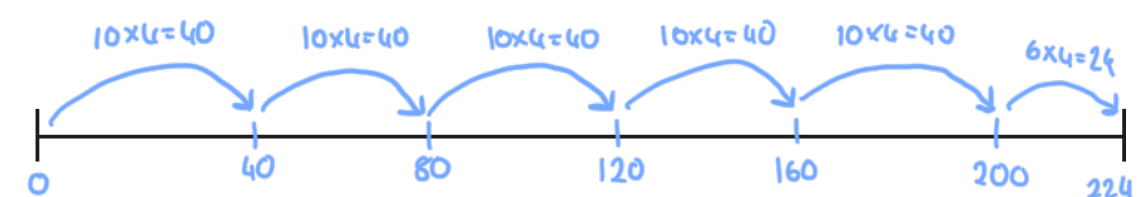
$$5 \times 32 = \boxed{160}$$



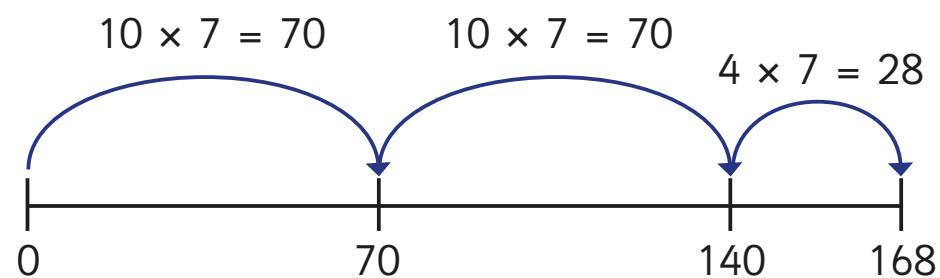
$$7 \times 32 = \boxed{224}$$



$$4 \times 56 = \boxed{224}$$



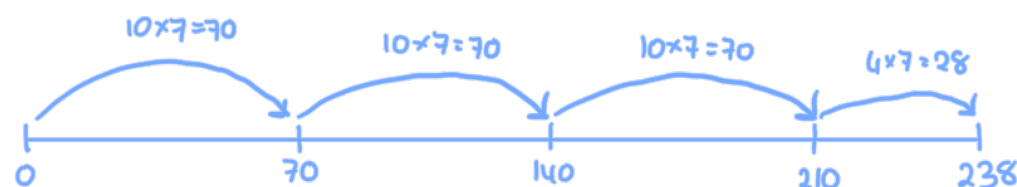
- 3 Mo uses a number line to work out  $7 \times 34$



What mistake has Mo made?

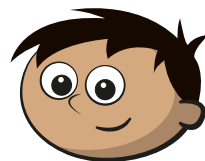
Talk about it with a partner.

What should the number line look like? Draw it here.



- 4 Amir is working out  $43 \times 5$

$40 \times 5 = 200$   
 $3 \times 5 = 15$   
 $43 \times 5 = 215$



a) Talk about Amir's method with a partner.

b) Use Amir's method to complete the multiplications.

$32 \times 6 =$  192

$7 \times 31 =$  217

$8 \times 42 =$  336

- 5 A farmer is calculating the number of sheep on her farm.  
She has 6 fields.

Each field has 35 sheep.

Use a written method to work out how many sheep there are altogether.

210

- 6 Here are 6 multiplications.

$4 \times 59$	$3 \times 33$	$5 \times 36$	$9 \times 32$	$7 \times 21$	$6 \times 25$
A	B	C	D	E	F

Which of the multiplications would you calculate mentally?

Various answers

Which of the multiplications would you use a written method for?

Various answers

Talk about your choices with a partner.

Complete the multiplications. Show your working where necessary.

$4 \times 59 =$  236

$9 \times 32 =$  288

$3 \times 33 =$  99

$7 \times 21 =$  147

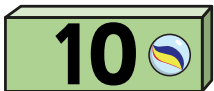







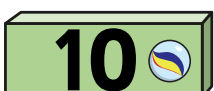

$5 \times 36 =$  180

$6 \times 25 =$  150

# Multiply 2-digits by 1-digit (1)



- 1 Ron, Eva and Mo each have 23 marbles.

Tens	Ones
 	  
 	  
 	  

How many marbles are there in total?

$$3 \times 3 \text{ ones} = \boxed{9}$$













$$3 \times 2 \text{ tens} = \boxed{60}$$

$$\boxed{9} + \boxed{60} = \boxed{69}$$

$$3 \times 23 = \boxed{69}$$

There are  $\boxed{69}$  marbles in total.

- 2 Use the place value chart to work out  $2 \times 24$   
Complete the multiplication sentences.















Tens	Ones
 	   
 	   

$$2 \times 4 = \boxed{8}$$

$$2 \times 20 = \boxed{40}$$

$$2 \times 24 = \boxed{48}$$

- 3 Annie works out  $43 \times 2 = 86$

Tens	Ones
   	  
   	  

		T	O	
		4	3	
	x		2	
		8	6	

Talk about Annie's methods with a partner.

What is the same? What is different?

- 4 Complete the multiplications.

a)

		T	O	
		2	4	
	x		2	
		4	8	

b)

		T	O	
		4	4	
	x		2	
		8	8	

c)  $31 \times 3$

		T	O	
		3	1	
	x		3	
		9	3	

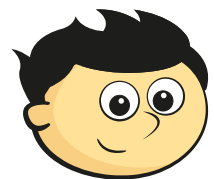
d)  $42 \times 2$

		T	O	
		4	2	
	x		2	
		8	4	

Compare answers with a partner.



- 5 Jack is trying to work out  $34 \times 2$  using the column method.



I'm not sure what to do.

			2	
	x	3	4	

Show how Jack could improve his column method and work out the answer.

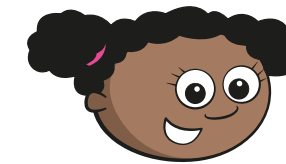
		3	4	
	x		2	
		6	8	

- 6 One toaster costs £32  
How much do 3 toasters cost?



£96

- 7 Whitney has multiplied a 2-digit number by a 1-digit number.



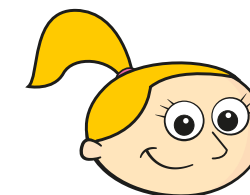
I had to do  $30 + 9 = 39$  to get my answer.

What numbers is Whitney multiplying?

Fill in the missing digits.

		1	3	
	x		3	
		3	9	

- 8 Filip used the column method to work out  $41 \times 2$



I can work this multiplication out in my head.

		4	1	
	x		2	

- a) How do you think Eva will work this out in her head?  
b) Tick the multiplications that you can work out in your head. *Various answers.*

$4 \times 22$

$3 \times 23$

$3 \times 33$

$12 \times 4$

$3 \times 32$

$4 \times 20$



## Multiply 2-digits by 1-digit

**I** Brett uses a place value chart to work out  $5 \times 32$

Hundreds	Tens	Ones
	10 10 10	1 1
	10 10 10	1 1
	10 10 10	1 1
	10 10 10	1 1
	10 10 10	1 1

Diagram illustrating the base ten blocks for the number 22. The blocks are organized into three columns: Hundreds, Tens, and Ones. The Tens column contains two groups of ten blocks (each group of ten is highlighted with a red box), and the Ones column contains two groups of one block (each group of one is highlighted with a red box). Red arrows point from the Tens column to a green circle labeled 100, and from the Ones column to a yellow circle labeled 10.

Talk about Brett's method with a partner.

Complete the multiplication.

$$5 \times 32 = 160$$

Use Brett's method to work out  $6 \times 34$

$$6 \times 34 = 204$$

**2** Rosie works out  $4 \times 37$  using a written method.

[illegible]

Talk about Rosie's method with a partner.

Use Rosie's method to work out  $6 \times 28$

A handwritten multiplication problem on blue grid paper:

$$\begin{array}{r} 28 \\ \times 6 \\ \hline 48 \\ 120 \\ \hline 168 \end{array}$$

The partial products are labeled to the right of the first two rows:

- $(8 \times 6)$  next to the row "48"
- $(20 \times 6)$  next to the row "120"

The final product "168" is enclosed in a red rectangular box.

3 Dani uses a different written method to work out  $8 \times 42$

		H	T	O	
			4	2	
	x			8	
		3	3	6	
			1		

Talk about Dani's method with a partner.



$$\begin{array}{r} 27 \\ \times 3 \\ \hline 81 \\ \hline 2 \end{array}$$

a)  $38 \times 6 = 228$       c)  $45 \times 9 = 405$

[illegible]

b)  $71 \times 3 = 213$       d)  $52 \times 5 = 260$

[illegible]

e)  $29 \times 8 =$  232      f)  $17 \times 4 =$  68

This image shows a blank sheet of graph paper. It features a uniform grid of squares defined by thin blue lines. The grid is composed of 6 horizontal rows and 18 vertical columns, creating a total of 108 small square units. There are no margins, text, or other markings on the page.

£280

136