



# Year 4 multiplication and division

## Prior Knowledge

- Recall and use multiplication and division facts for the 2, 3, 4, 5, 8 and 10 multiplication tables, including recognising odd and even numbers (Y2&3)
- Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot (Y2)
- Write and calculate mathematical statements for multiplication and division using known multiplication tables, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (Y3)
- Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which  $n$  objects are connected to  $m$  objects (Y3)

multiplication and division		Working Towards	Within	Expected	Above
$\times \div$	Recall multiplication and division facts for multiplication tables up to $12 \times 12$				
	Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers				
	Recognise and use factor pairs and commutativity in mental calculations				
	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout				
	Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as $n$ objects are connected to $m$ objects				
Highlights: _____					
_____					



## Glossary

vocabulary	word class	definition
multiplication	noun	the process of combining matrices, vectors, or other quantities under specific rules to obtain their product
division	noun	the process of dividing a matrix, vector, or other quantity by another under specific rules to obtain a quotient
calculating	verb	determine (the amount or number of something) mathematically
arrays	noun	an arrangement of quantities or symbols in rows and columns; a matrix
integer	noun	a number which is not a fraction; a whole number
factor pairs		<i>a set of two integers that give a particular product when multiplied together</i>
product		<i>the answer when two or more values are multiplied together</i>
distributive law		<i>multiplying a number by a group of numbers added together is the same as doing each multiplication separately</i>







## Multiplication

multiply  
times  
groups of  
lots of  
repeated addition  
product  
multiplied by

## Division

group  
grouping  
sharing  
half  
halves  
share equally  
equal groups

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

## Multiplication Strategies

### Expanded Column Method

Line up the ones and the tens.

Multiply the ones.

Multiply tens.

Add the totals together.

$$\begin{array}{r}
 42 \\
 \times 6 \\
 \hline
 12 \\
 240 \\
 \hline
 252
 \end{array}$$

(2 × 6)

(40 × 6)

$$42 \times 6 = 252$$

## Multiplication Magic

$$60 \times 4$$

Draw the wizard's hat to find the facts to calculate

$$6 \times 4 = 24$$


Multiply the answer by 10/100/1000

$$60 \times 4$$


Write your final answer

$$60 \times 4 = 240$$

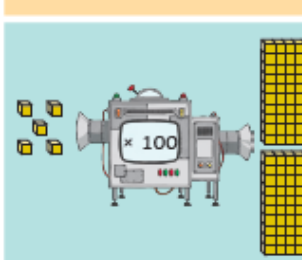
## Use Place Value to Multiply and Divide Mentally



$5 \times 1 = 5$   
 $5 \div 1 = 5$



$5 \times 10 = 50$   
 $50 \div 10 = 5$



$5 \times 100 = 500$   
 $500 \div 100 = 5$

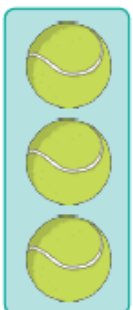
There are 69 tennis balls packed in tubes of 3.

There are 23 tubes altogether.

$$69 \div 3 = 23$$

$$\begin{array}{r}
 23 \\
 3 \overline{) 69}
 \end{array}$$

69		
23	23	23



### Factor pairs and Commutativity

The factors of 20 are 1, 2, 4, 5, 10 and 20.  
The factor pairs are:  
1 and 20    2 and 10    4 and 5

$5 \times 4 = 20$

$4 \times 5 = 20$

### Multiply Using Formal Written Methods

Th	H	T	O
	5	4	3
x			4
		1	2
	1	6	0
2	0	0	0
2	1	7	2

$(4 \times 3)$   
 $(4 \times 40)$   
 $(4 \times 500)$

Th	H	T	O
	5	4	3
x			4
2	1	7	2
	1	1	

Remember to move any regrouped numbers into the next column. After the next multiplication, add the regrouped number to the answer.

### Mental Calculations for Solving Problems

$(2 \times 3) \times 4 = 24$

$(2 \times 4) \times 3 = 24$

$(3 \times 4) \times 2 = 24$

Diagram showing  $16 \times 3$  broken down into  $10 \times 3$  and  $6 \times 3$ , resulting in  $30 + 18 = 48$ .

### Integer Scaling Problems

**10 pencils**

**$10 \times 4 = 40$  pencils**

**75g**

**$75g \times 2 = 150g$**



## Future Learning

Year 5	
	Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
	Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
	Establish whether a number up to 100 is prime and recall prime numbers up to 19
	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
	Multiply and divide numbers mentally drawing upon known facts
	Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000
	Recognise and use square numbers and cube numbers, and the notation for squared ( $^2$ ) and cubed ( $^3$ )
	Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes
	Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
	Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates
Year 6	
	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
	Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
	Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context