

Key Vocabulary:

- times tables
- multiply by
- array
- related facts
- lots of
- groups of
- multiple
- repeated addition
- factor
- factor pair
- product
- prime number
- cubed number
- square number
- short multiplication
- long multiplication

Key learning: multiply whole numbers by 10, 100 and 1000

Use the same method as in Year 4:

Year 4:

For example,  
42 x 100 =

Th	H	T	U
		4	2
4	2	0	0

42 x 100 = 4200

Each digit becomes 100 times larger (moves 2 place value columns to the left)

Year 5:

For example,  
34 x 1000 =

Tth	Th	H	T	U
			3	4
3	4	0	0	0

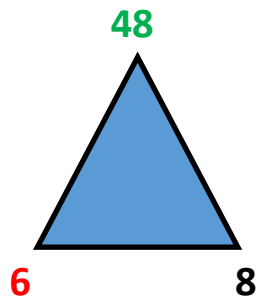
34 x 1000 = 34000

Each digit becomes 1000 times larger (moves 3 place value columns to the left)

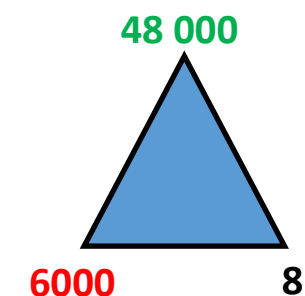
MENTAL METHOD

Key learning: use related facts to multiply multiples of 1000 by a 1-digit number

Example: 6000 x 8



I know 6 x 8 = 48



So 6000 x 8 = 48 000

**RAPID RECALL:** recall prime numbers up to 19

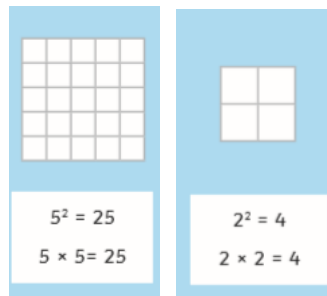
A prime number has only 1 and itself as factors  
(learn by heart the prime numbers up to 19—dark purple circles)



Key learning: recognise and use square and cube numbers

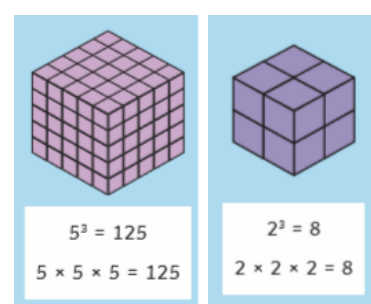
**RAPID RECALL:** recall square numbers up to 12 x 12

Square numbers:



Square numbers result from a number being multiplied by itself  
For example, 5 x 5 = 25  
So "5 squared is 25"  
This can be written  
 $5^2 = 25$   
<sup>2</sup> is the symbol for squared

Cubed Numbers:



Cubed numbers result from a number being multiplied by itself twice  
For example 5 x 5 x 5 = 125  
So "5 cubed is 125"  
This can be written  
 $5^3 = 125$   
<sup>3</sup> is the symbol for cubed

**Know by Heart**

$1^2$	1
$2^2$	4
$3^2$	9
$4^2$	16
$5^2$	25
$6^2$	36
$7^2$	49
$8^2$	64
$9^2$	81
$10^2$	100
$11^2$	121
$12^2$	144

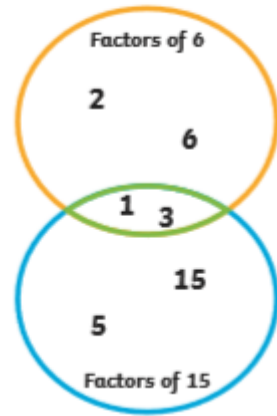
**Key learning:** identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers

Remember, a factor is a number which divides exactly into another number.  
**Example:** the factors of 8 are 1,2,4, and 8  
 Factors can be shown in pairs.  
 The factor pairs of 8 are  $1 \times 8$  and  $2 \times 4$

A common factor is a factor of 2 or more numbers.

Factor pairs of 36 are:  
 $1 \times 36$   
 $2 \times 18$   
 $3 \times 12$   
 $4 \times 9$   
 $6 \times 6$

Start with 1 x the number, then work in order until no more can be found



Remember, a multiple is the product result of multiplying one number by another  
**Example:**  
 Multiples of 2 are all the numbers in the 2 times table and so on.

The common factors of 6 and 15 are 1 and 3

**MENTAL METHOD**

**Key learning:** use factor pairs to multiply multiples of 10

**Example:**  $60 \times 40$

60 and 40 can be broken down using knowledge of factor pairs

$6 \times 10 \times 4 \times 10$

Use your knowledge of commutativity to rearrange the calculation

$6 \times 4 \times 10 \times 10$

Which becomes

$24 \times 100 = 2400$

**WRITTEN METHOD**

**Key learning:** Multiply a 4-digit number by a 1-digit or 2-digit number using the column method of short multiplication

**Expanded Method:**

Th	H	T	U	
	3	6	8	
				6
		4	8	(8 x 6)
	3	6	0	(60 x 6)
+	1	8	0	0 (300 x 6)
	2	2	0	8
	2	2	0	8

This shows you how each digit is multiplied in turn, starting from right to left

Which becomes:

Th	H	T	U	
	3	6	8	
				6
		4	8	
	3	6	0	
+	1	8	0	0
	2	2	0	8
	2	2	0	8
		4	4	

**The Year 5 Expectation**

Short Multiplication

Long Multiplication

$2543 \times 7 = 17801$

	2	5	4	3
x				7
1	7	8	0	1
1	3	3	2	1

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

$2543 \times 67 = 170381$

	2	5	4	3
x			6	7
1	7	8	0	1
1	5	2	5	8
1	3	2	1	1
1	7	0	3	8
1	7	0	3	8

Before multiplying by the number in the tens column, remember to use zero as a placeholder because the 6 in 67 is 6 tens (60).