



Maths Knowledge Organiser

Year 5: Multiplication and Division

Prior Knowledge (Y4 Unit 5, 6)

- Recall multiplication and division facts up to 12×12
- Multiply and divide mentally by multiples of 10 and 100
- Multiply by 0 and 1; divide by 1;
- Problem solving - addition and multiplication; mixed problems
- Understand the meaning of the equals sign
- Multiply two-digit and three-digit numbers by a one-digit number using formal written method (column)
- Divide two-digit and three-digit numbers by a one-digit number using formal written method
- Recognise and use factor pairs and commutativity in mental calculations

Structures and Representations

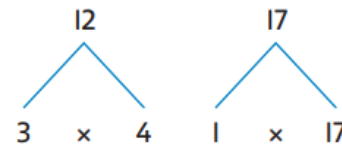
Arrays



Multiplication Grid

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36

Factor Trees



- Multiple
- Factor
- prime number
- composite number
- square ($\times 2$)
- cube ($\times 3$)
- multiply, multiplication, times
- divide, division
- inverse operation
- place value
- ones, tens, hundreds, thousands, tens of thousands

Prime Numbers

A whole number greater than 1, divisible only by itself and 1.

Top tips:

- 2 is the only even prime number.
- There are no prime numbers that end in 5, except for 5.
- The digits can't add up to 3, except 3.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

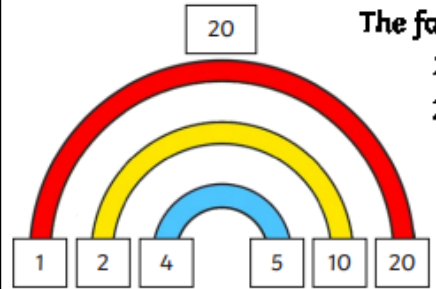
Multiples and Factors

A multiple is a number which can be divided by another number without a remainder.

Multiples of 5 = 5, 10, 15, 20, 25, 30

Factors are whole number that can multiply by other whole numbers to make the product.

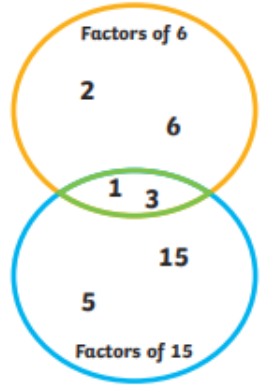
The factors of 20 are 1, 2, 4, 5, 10 and 20.



The factor pairs are:

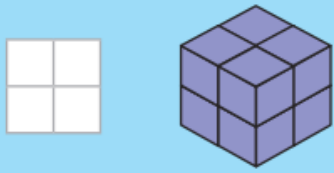
- 1 and 20
- 2 and 10
- 4 and 5

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



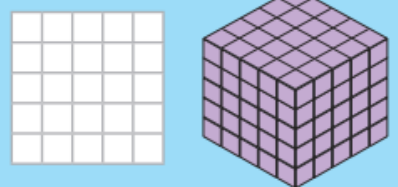


Squared² and Cubed³ Numbers



$2^2 = 4$
 $2 \times 2 = 4$

$2^3 = 8$
 $2 \times 2 \times 2 = 8$



$5^2 = 25$
 $5 \times 5 = 25$

$5^3 = 125$
 $5 \times 5 \times 5 = 125$

Using Related Facts

$$\begin{array}{r} 7 \times 0.5 \\ 7 \times 5 = 35 \\ \quad \downarrow \div 10 \quad \downarrow \div 10 \\ 7 \times 0.5 = 3.5 \end{array}$$

$$\begin{array}{r} 2400 \div 6 \\ 24 \div 6 = 4 \\ \downarrow \times 100 \quad \downarrow \times 100 \\ 2400 \div 6 = 400 \end{array}$$

See if there is a known multiplication or division fact you can use.

Use your knowledge of multiplying and dividing by 10, 100 and 1000 to adjust the answer.

Short Division

		3	8
4	1	5	2

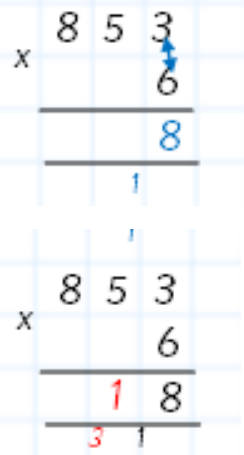
You can check with the inverse operation (short multiplication)

$38 \times 4 = 152$

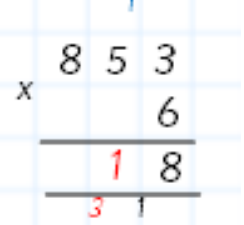
$15 \div 4 = 3$ remainder 3

Remember to regroup any remainders and move them into the next column.

4-digit \times 1-digit (Short Multiplication)



1. Multiply the ones digit by the multiplier. Carry the extra digit if needed.



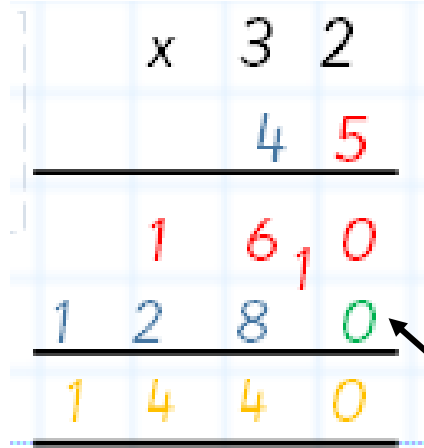
3. Multiply the hundreds digit by the multiplier. Add only the carried digits.

$$\begin{array}{r} 853 \\ \times 6 \\ \hline 5118 \end{array}$$

$853 \times 6 = 5118$

2. Multiply the tens digit by the multiplier. Add any carried digits. Carry the extra digit if needed.

4-digit \times 2-digit (Long Multiplication)



Long multiplication lets us multi-digit number together.

This calculation is the same as doing $32 \times 5 = 160$ and $32 \times 40 = 1280$, then adding them together to make 1440.

The green zero is a placeholder which shows that in the second half of the calculation, we are multiplying by 40, not 4.