

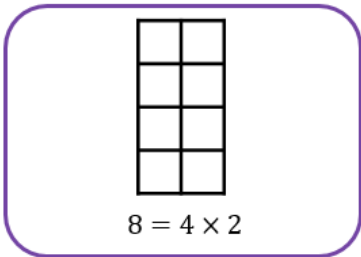
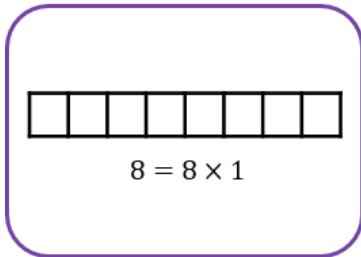
Y7 Mastery: Unit 3 - Factors and multiples

A **factor** of a number is an integer that divides the number exactly leaving no remainder.

Factors

For example 8 has 4 factors: 1, 2, 4 and 8

Factor pairs multiply to equal the number:



Any numbers that are factors of two or more numbers are said to be **common factors** of those numbers.

Common Factors

Factors of 12:

1×12
 2×6
 3×4

All the ways of making a product of 12.

So 1, 2, 3, 4, 6, and 12 are all the factors of 12.

Factors of 20:

1×20
 2×10
 4×5

All the ways of making a product of 20.

So 1, 2, 4, 5, and 20 are all the factors of 20.

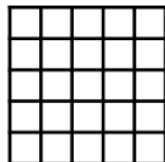
Both lists of factors here have 1, 2 and 4 included.
Therefore, 1, 2 and 4 are common factors of 12 and 20.

A **square number** always has an odd number of factors.

Square Number

A **square number** is the result of multiplying an integer by itself.

e.g. $5 \times 5 = 5^2 = 25$... so 25 is square number.



You can build a square array with 25 tiles:

$\sqrt{1} = 1$ since $1^2 = 1$
 $\sqrt{4} = 2$ since $2^2 = 4$
 $\sqrt{9} = 3$ since $3^2 = 9$
 $\sqrt{16} = 4$ since $4^2 = 16$
 $\sqrt{25} = 5$ since $5^2 = 25$

$\sqrt{36} = 6$ since $6^2 = 36$
 $\sqrt{49} = 7$ since $7^2 = 49$
 $\sqrt{64} = 8$ since $8^2 = 64$
 $\sqrt{81} = 9$ since $9^2 = 81$
 $\sqrt{100} = 10$ since $10^2 = 100$

A prime number has exactly two factors.

Prime Numbers

- 2 3 5 7 11 13 17
 19 23 29 31 37 41
 43 47 53 59 61 67
 71 73 79 83 89 97

Other Topics/Units this could appear in:

- Numbers, powers, roots, decimals and rounding
- Product of prime factors
- Multiples in context
- Factorising

Keyword/Skill	Definition/Tips
Integer	Whole number including 0 and negative numbers. No fractions or decimals.
Product	Multiply
Prime Number	Has exactly two factors
Square Number	The result of multiplying an integer by itself
Cube number	The result of multiplying an integer by itself three times i.e. $2 \times 2 \times 2 = 8$
Multiples	The result of multiplying a number by an integer (comes up in its timetable)
Common multiples	A number that is a multiple of two numbers
LCM	Smallest whole number that is a multiple of two numbers
Factors	An integer that divides the number exactly leaving no remainder
Factor pairs	A set of numbers that multiply to equal the number
HCF	The highest common factor (HCF) of two or more numbers is the largest number that is a factor of all of the given numbers.

Y7 Mastery: Unit 3 - Factors and multiples

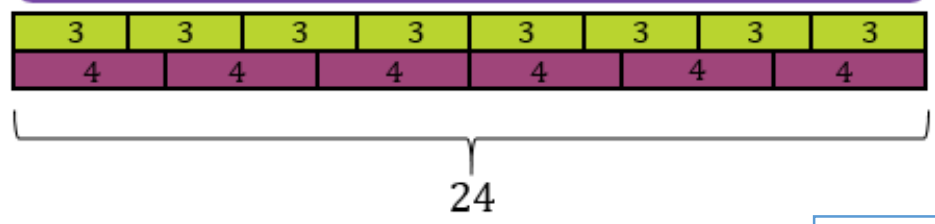
A **multiple** is the result of multiplying a number by an integer (so it comes up in its times table).

Multiples

multiples of 2: 2, 4, 6, 8, 10, 12, ...

multiples of 3: 3, 6, 9, 12, 15, ...

24 is a **common multiple** of 3 and 4 as it is a multiple of 3 and a multiple of 4.



What other common multiples of 3 and 4 can you think of?

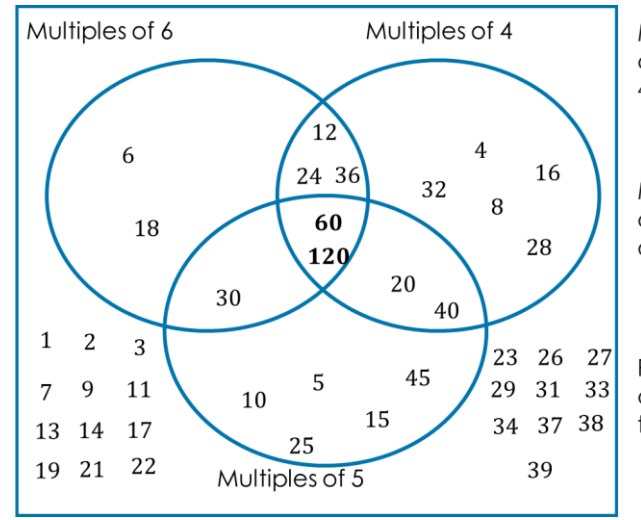
Common Multiples

We can find common multiples by comparing multiplication tables.

Multiples of 5	Multiples of 3
5	3 27
10	6 30
15	9 33
20	12 36
25	15 39
30	18 42
35	21 45
40	24 48
45	

We can see from these two lists of multiples that **15**, **30** and **45** are common multiples of both 3 and 5.

Sort the integers from 1 – 40 in to this **Venn diagram**:



Multiples of 20 are common multiples of 4 and 5.

Multiples of 12 are common multiples of 6 and 4.

Primes, except 5, are found outside the three sets.

- Other Topics/Units this could appear in:
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 - Product of prime factors
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Keyword/Skill	Definition/Tips
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Product	Multiply
Prime Number	Has exactly two factors
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