

Multiples, factors, prime and composite numbers, prime factors, square and cube numbers

Multiples & factors

- FACTORS** are the numbers that divide exactly into another number.

e.g. Factors of 12 are: Factors of 18 are:

1	12
2	6
3	4

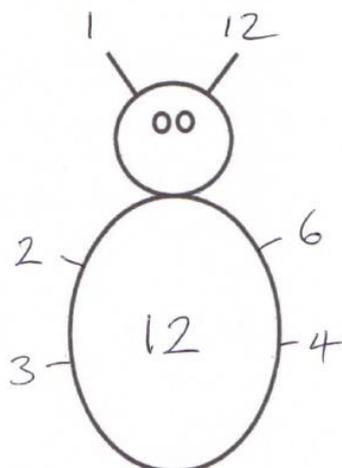
1	18
2	9
3	6

The common factors of 12 & 18 are: 1, 2, 3, 6,
The Highest Common Factor is: 6

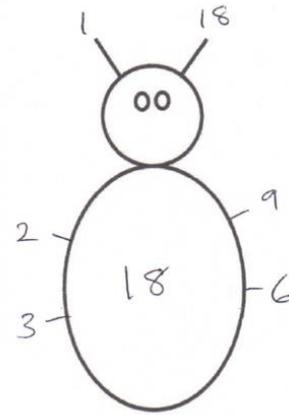
We use **FACTOR BUGS** to help us work out the factors of a number. Factor bug rules:

- The number that we are trying to find the factors of is written on the bug's tummy.
- All numbers have at least two factors: these always include 1 and itself which are written on the bug's antennae.
- No number can be repeated around the outside of the factor bug's body.
- Note: the number 1 only has one factor - itself so it would have no numbers on the antennae, but would have a tail (see Number 1 section below).*

Example: factor bug for 12...



Example: factor bug for 18...



- MULTIPLES** are the times table answers
 e.g. Multiples of 5 are: Multiples of 4 are:

5 10 15 **20** 25

4 8 12 16 **20**

The Lowest Common Multiple of 5 and 4 is: 20

Prime numbers

Prime numbers have only TWO factors

The factors of 12 are:
 1, 2, 3, 4, 6, 12

↑
 12 is NOT prime

The factors of 7 are:
 1, 7

↑
 7 IS prime

On a factor bug, the two factors would be written on the antennae. Example of a factor bug for 7...



Composite numbers

Numbers which are not prime numbers are called **COMPOSITE** numbers.

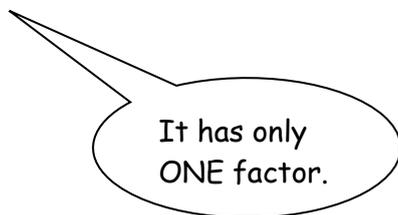
Prime numbers to 20

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

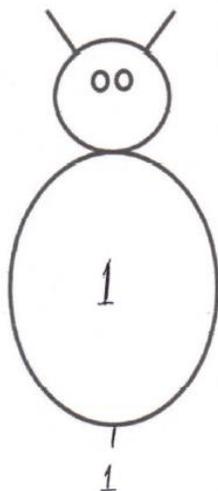
The numbers in red are prime numbers.
The numbers in black are composite numbers.

Number 1

The number '1' is NOT prime.



On a factor bug for 1, as numbers cannot be repeated around a bug's body, the only number that can be divided exactly into one is 1 itself, so it has to be written on the bug's tail. But, it is not a prime number as prime numbers all have TWO factors (one and itself).

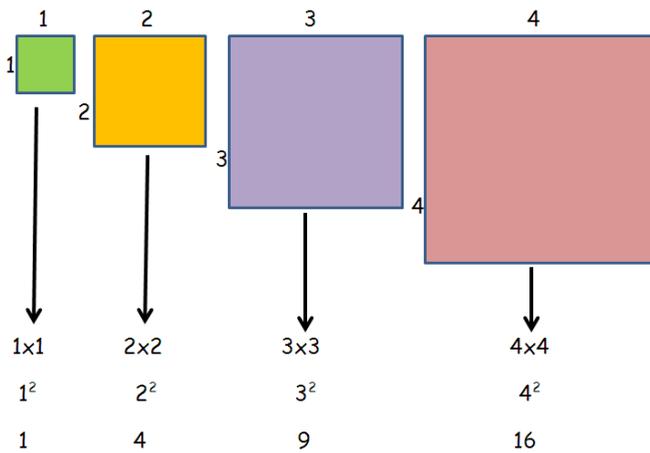


Prime factors

A **PRIME FACTOR** is a factor of a number that is also a prime number. For example, 2 and 3 are both factors of 18 (see earlier factor bug of 18) and both are also prime numbers (their only factors are 1 and itself). Therefore, 2 and 3 are prime factors of 18.

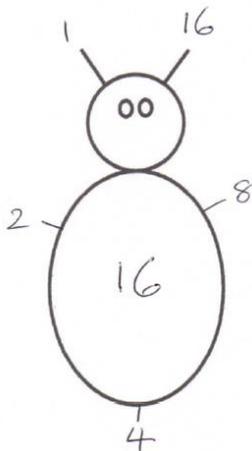
Square numbers

Square numbers



Square numbers are the answer when you multiply a number by itself, e.g. 1×1 , 2×2 , 3×3 etc.

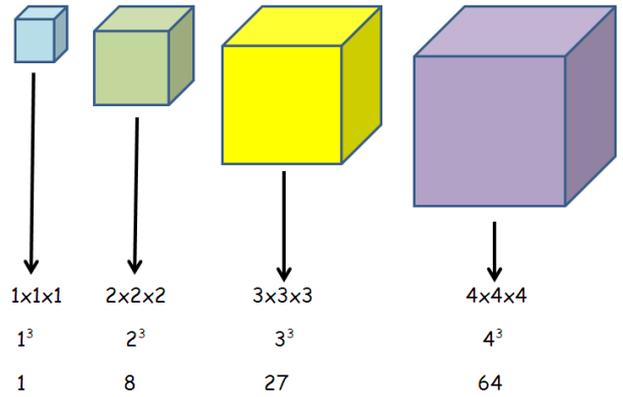
Square numbers can be spotted from drawing a factor bug - they all have tails! An example of a factor bug for a square number is 16 (4×4) and is drawn below...



The number on the tail is known as the **SQUARE ROOT** of the square number (so, 4 is the square root of 16 in the example above).

Cube numbers

Cube numbers



Cube numbers are the answer when you multiply a number by itself and then by itself again, e.g. $1 \times 1 \times 1$, $2 \times 2 \times 2$, $3 \times 3 \times 3$ etc.