

Factors, multiples, square numbers and prime numbers

Factors and multiples

If two smaller numbers multiplied together make a bigger number, then the smaller numbers are **factors** of the big number, and the big number is a **multiple** of both of the smaller numbers.

For example:

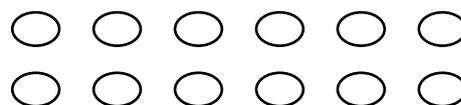
$3 \times 5 = 15$ 3 and 5 are **factors** of 15. 15 is a **multiple** of 3 and a **multiple** of 5.

$4 \times 7 = 28$ 4 and 7 are **factors** of 28. 28 is a **multiple** of 4 and a **multiple** of 7.

One way of finding factors of a number is to recognise it in your times tables.

Another way is to use counters and arrange them in a grid.

12 counters can be arranged in a grid 2×6 . This means that 2 and 6 are both factors of 12.



They can also be arranged in a 3×4 grid, so this means 3 and 4 are factors of 12.



They can also be arranged in a single line of 12, so 1 and 12 are factors.



This gives all factors of 12 as 1, 2, 3, 4, 6 and 12.



One way of finding multiples of a number is to keep adding that number.

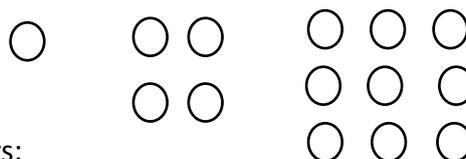
For example, multiples of 3 are 6, 9, 12...

Square numbers

A number like 4 or 9 can be arranged in a square. They are called square numbers. We count 1 as a square number.

Square numbers can be written like this:

$2^2 = 4$ $3^2 = 9$



It is useful to know and recognise the first few square numbers:

1^2	2^2	3^2	4^2	5^2	6^2	7^2	8^2	9^2	10^2
1	4	9	16	25	36	49	64	81	100

Prime numbers

A number like 7 can only be arranged in a grid of 1×7 .

A number like this is called a **prime number**. Prime numbers have no factors other than 1 and the number itself. They cannot be divided up into smaller groups of equal size.



It is useful to know prime numbers at least up to 20:

2, 3, 5, 7, 11, 13, 17, 19

Now you try.

List the factors of these numbers.

1. 12

20

25

13

14

2. Give 3 multiples for these numbers:

5

8

16

2

3. Underneath each number up to 20, list the factors for it. Circle the ones that only have themselves and 1 as their factors. These are prime numbers. Remember that 1 is not a prime number but 2 is.

1 2 3 4 5 6 7 8 9 10

11 12 13 14 15 16 17 18 19 20