

## 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:

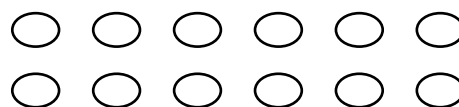
$3 \times 5 = 15$     3 and 5 are **factors** of 15. 15 is a **multiple** of 3 and a **multiple** of 5.

$4 \times 7 = 28$     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  $2 \times 6$ . This means that 2 and 6 are both factors of 12.



They can also be arranged in a  $3 \times 4$  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.

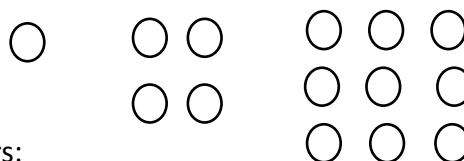
For example, multiples of 3 are 6, 9, 12...

### 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:

$$2^2 = 4 \quad 3^2 = 9$$



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  $1 \times 7$ .

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