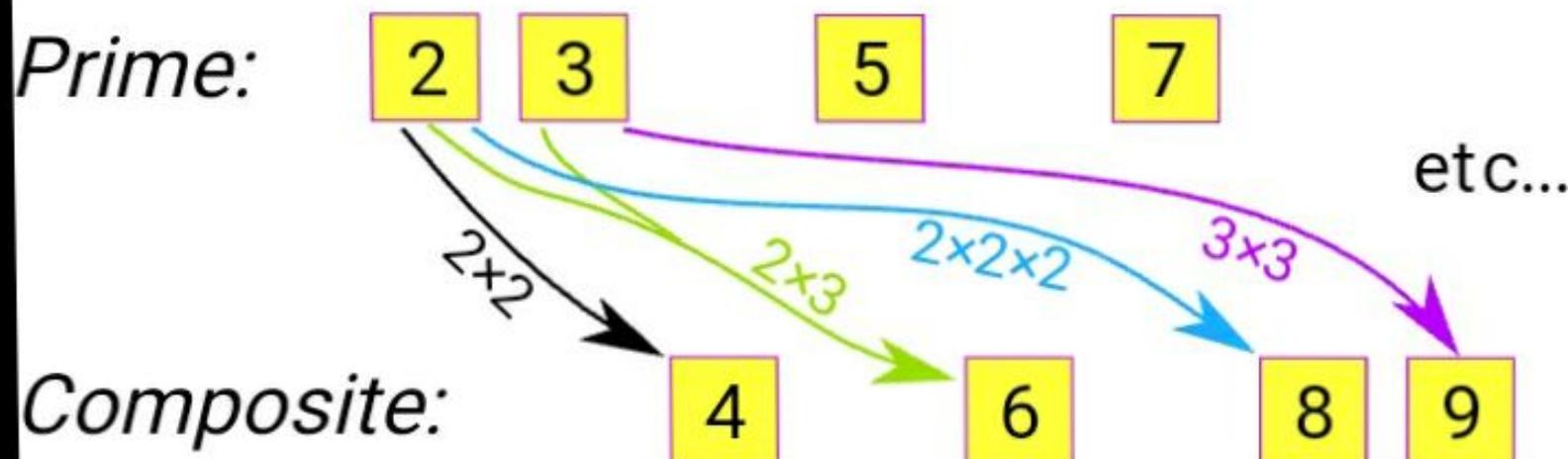


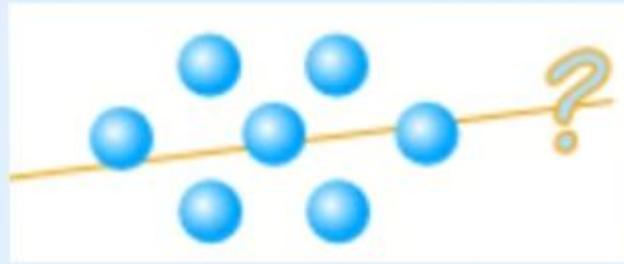
- When a number can be divided up exactly it is a **Composite Number**
- When a number **cannot** be divided up exactly it is a **Prime Number**

So **6** is Composite, but **7** is Prime

Like this:



Example: is 7 a Prime Number or Composite Number?



- We **cannot** divide 7 exactly by 2 (we get 2 lots of 3, with one left over)
- We **cannot** divide 7 exactly by 3 (we get 3 lots of 2, with one left over)
- We **cannot** divide 7 exactly by 4, or 5, or 6.

We can **only** divide 7 into one group of 7 (or seven groups of 1):



$$7 = 1 \times 7$$

So 7 is a **Prime Number**

It is a **Composite Number** when it **can** be divided exactly by a whole number other than itself.

Like this:

Example: is **6** a Prime Number or Composite Number?

6 can be divided exactly by 2, or by 3, as well as by 1 or 6:

$$6 = 1 \times 6$$

$$6 = 2 \times 3$$

So 6 is a **Composite Number**

Sometimes a number can be divided exactly **many ways**:

Example: **12** can be divided exactly by 1, 2, 3, 4, 6 and 12:

$$1 \times 12 = 12$$

$$2 \times 6 = 12$$

$$3 \times 4 = 12$$

So 12 is a **Composite Number**

And note this:

Any whole number greater than 1 is either **Prime** or **Composite**

## Activity

You can try this [Prime Numbers Activity](#).

## Factors

We can also define a Prime Number using factors.

$$\begin{array}{ccc} & 2 & \times & 3 & = & 6 \\ & \nearrow & & \nwarrow & & \\ \text{Factor} & & & & & \text{Factor} \end{array}$$

"Factors" are numbers we multiply together to get another number.

# Examples From 1 to 14

Factors other than 1 or the number itself are highlighted:

Number	Can be Exactly Divided By	Prime, or Composite?
1	<i>(1 is not prime or composite)</i>	
2	1, 2	Prime
3	1, 3	Prime
4	1, 2, 4	Composite
5	1, 5	Prime
6	1, 2, 3, 6	Composite
7	1, 7	Prime
8	1, 2, 4, 8	Composite
9	1, 3, 9	Composite
10	1, 2, 5, 10	Composite
11	1, 11	Prime
12	1, 2, 3, 4, 6, 12	Composite
13	1, 13	Prime
14	1, 2, 7, 14	Composite

Example: 12 is made by multiplying the prime numbers **2**, **2** and **3** together.

$$12 = 2 \times 2 \times 3$$

The number **2** was repeated, which is OK.

In fact we can write it like this using the

exponent of 2:

$$12 = 2^2 \times 3$$

Go straight to [Factors Calculator](#).

Factors are the numbers you multiply together to get another number:

$$\begin{array}{c} 2 \times 3 = 6 \\ \nearrow \quad \nwarrow \\ \text{Factor} \quad \text{Factor} \end{array}$$

There can be many factors of a number.

### Example: All the factors of 12

- $2 \times 6 = 12$ ,
- but also  $3 \times 4 = 12$ ,
- and of course  $1 \times 12 = 12$ .

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

And also -1, -2, -3, -4, -6 and -12, because you get a positive number when you multiply two negatives, such as  $(-2) \times (-6) = 12$

Answer: 1, 2, 3, 4, 6, 12, -1, -2, -3, -4, -6, -12

# How Can I Do It Myself?

Work from the outside in!

**Example: All the factors of 20.**

**Start at 1:**  $1 \times 20 = 20$ , so put 1 at the start, and put its "partner" 20 at the other end:

1		20
---	--	----

**Then go to 2.**  $2 \times 10 = 20$ , so put in 2 and 10:

1	2		10	20
---	---	--	----	----

**Then go to 3.** 3 doesn't work ( $3 \times 6 = 18$ ,  $3 \times 7 = 21$ ).

**Then on to 4.**  $4 \times 5 = 20$ , so put them in:

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

There is no whole number between 4 and 5 so you are done! (Don't forget the negative ones).

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