# Factors.

Please note every effort has been made to make this pack accessible, but due to the nature of some of the content, it may not be accessible by screen readers. If you have any queries or need any help, please email [learningdevelopment@northampton.ac.uk](mailto:learningdevelopment@northampton.ac.uk)

Every number has factors.The following examples show what is meant by factors.

What are the **factors of 6**? 6 can be made up of:

1 multiplied by 6 = 6, and 2 multiplied by 3 = 6.

Therefore, we can say that 1, 2, 3, and 6 are factors of 6.

What are the **factors of 42**?

1 (times) 42 = 42

2 (times) 21 = 42

3 (times) 14 = 42

6 (times) 7 = 42

Therefore, we say that 1, 2, 3, 6, 7, 14, 21 and 42 are the factors of 42.

What are the **factors of 60**?

1 (times) 60 = 60

2 (times) 30 = 60

3 (times) 20 = 60

4 (times) 15 = 60

5 (times) 12 = 60

6 (times) 10 = 60

Therefore, we say that 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, and 60 are the factors of 60.

**Remember :** A number is a factor of another number if it divides into that number without a remainder.

If you have an **even** number,2 will divide into it without a remainder. If the number ends in 0 or 5, then 5 will divide into it (without a remainder).

## MULTIPLES

If we look at the multiples of 3, we see that they are:-

3, 6, 9, 12, 15, 18, 21 …

The multiples of 5 are:-

5, 10, 15, 20, 25, 30 …

If you work out the multiples of the numbers from 2 to 10, you have, in fact, drawn a multiplication table!

**Exercise 1**

Please put in the correct number where the word “blank” appears.

1 2 3 4 5 6 7 8 9 10

2 4 blank 8 10 12 blank 16 18 20

3 blank 9 12 15 18 21 blank 27 30

4 8 12 16 blank 24 28 32 36 blank

5 10 15 blank 25 30 35 blank 45 50

6 blank 18 24 blank 36 42 48 blank 60

7 14 21 28 35 blank 49 blank 63 blank

8 blank blank 32 blank blank 56 blank blank blank

9 18 blank 36 45 blank blank blank blank 90

10 20 blank blank blank blank blank blank blank

## PRIME NUMBERS

The following are prime numbers:-

2, 3, 5, 7, 11, 13, 17, 19 ……

There are many more!

2 is the only even prime number.

So, a prime number can be described as a number which can only be divided by 1 and itself.

**Example 1**

and

14 can be divided by 2 and 7 and therefore is not a prime number.

**Exercise 2**

Write down which of these you think are prime numbers;

3 9 12 15 17

20 21 23 27 29

### EXPRESSING A NUMBER AS A PRODUCT OF ITS PRIMES

**Example 2**

Express 12 as a product of its primes: (When you reach 1, you have finished).

Therefore, 12 = 2 (times) 2 (times) 3

Or we say that 12 is a product of 2, 2 and 3.

If a number is multiplied by itself once, we say that the number is **“**squared**”**, so the answer here could also be:-

(times) 3

You will be shown how to do this type of question in the study pack on Indices.

**Example 3**

Express 132 as the product of its primes:

Or 132 = 2 (times) 2 (times) 3 (times) 11

132 is the product of 2, 2, 3 and 11.

Or (times) 3 (times) 11

**Example 4**

Express 210 as the product of its primes:

Therefore, 210 = 2 (times) 3 (times)5 (times) 7

Or 210 is the product of 2, 3, 5 and 7.

Using the same method, try the exercise below.

**Exercise 3**

a) 24

b) 36

c) 50

d) 100

e) 144

## ANSWERS

### MULTIPLES

#### Exercise 1

1 2 3 4 5 6 7 8 9 10

2 4 6 8 10 12 14 16 18 20

3 6 9 12 15 18 21 24 27 30

4 8 12 16 20 24 28 32 36 40

5 10 15 20 25 30 35 40 45 50

6 12 18 24 30 36 42 48 54 60

7 14 21 28 35 42 49 56 63 70

8 16 24 32 40 48 56 64 72 80

9 18 27 36 45 54 63 72 81 90

10 20 30 40 50 60 70 80 90 100

### PRIME NUMBERS

#### Exercise 2

3 17 23 29

### EXPRESSING A NUMBER AS A PRODUCT OF ITS PRIMES

#### Exercise 3

a) 2 x 2 x 2 x 3

b) 2 x 2 x 3 x 3

c) 2 x 5 x 5

d) 2 x 2 x 5 x 5

e) 2 x 2 x 2 x 2 x 3 x 3

This concludes the Numeracy – Factors study pack.