# Factors.

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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**

$7÷7=1$ and $2÷2=1$

$$14÷2=7$$

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).

$$12÷2=6$$

$$6÷2=3$$

$$3÷3=1$$

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:-

$12=2^{2}$ $×$ (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:

$$132÷2=66$$

$$66÷2=33$$

$$33÷3=11$$

$$11÷11=1$$

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

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

Or $132=2^{2} ×$ (times) 3 $×$ (times) 11

**Example 4**

Express 210 as the product of its primes:

$$210÷2=105$$

$$105÷3=35$$

$$35÷5=7$$

$$7÷7=1$$

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.