# Maths Level 1 – Positive and Negative Numbers

1 of 17 – Welcome

Welcome to this session on positive and negative numbers.

By the end of this session you should be able to:

* Understand positive and negative numbers in practical contexts
* Use a number line for addition and subtraction

2 of 17 – Positive and negative numbers

Do you know what a positive and negative number is?

A **negative number** is less than zero. When we write negative numbers we put a negative sign

before the digit. Sometimes negative numbers are called minus numbers – be careful not to confuse

these with subtraction. For example: -2 (this number has a negative sign before the digit).

A **positive number** is more than zero. Unlike negative numbers, you don’t need to put a sign in

front of positive numbers. For example: 3 (this number doesn’t have a negative sign before the digit).

3 of 17 – When do we use negative numbers?

You probably come across negative numbers every day but may not have noticed!

Here are some examples of negative numbers used in everyday life:

* Lift floors are labelled as negative numbers if they are below floor level
* A bank statement will show money taken from your account as a negative number
* A freezer thermometer will show the temperature as a negative number

4 of 17 – Question 1

Which of the following real life situations could include positive and negative numbers?

Choose all that apply:

1. The outside temperature
2. The length of a room
3. The weight of a bag of sugar
4. The balance of a current account
5. The length of a meeting

The correct answers are A and D, the outside temperature and the balance of a current account.

5 of 17 – Question 2

Which of the following real life situations only include positive numbers?

Choose all that apply:

1. The floors of a building
2. The length of a film
3. The capacity of a bath
4. The height of a person
5. The price of a chocolate bar

The correct answers are B, C, D and E, the length of a film, the capacity of a bath, the height of a person and the price of a chocolate bar.

6 of 17 – Number lines

A number line is a useful tool to help you work with positive and negative numbers.

For example, consider a line marked with numbers all the way across. The numbers range from -5 to 5, so would show the following numbers: -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5.

However, you can draw a number line for any range of numbers. For example from 8 to 18, or from 3 to 13.

7 of 17 – Addition using a number line

You can use a number line to help you add numbers together.

For example, consider a number line marked from -5 to 5. To work out 1 + 3, you would find the number 1 on the number line.

Add the 3 by moving right along the number line 3 places.

The answer is where you end up on the number line: 1 + 3 = 4.

8 of 17 – Subtraction using a number line

You can also use a number line to help you subtract.

For example, consider a number line marked from -5 to 5. To work out 1 minus 3, find number 1 on the number line.

Subtract the 3 by moving left along the number line 3 places.

The answer is where you end up on the number line: 1 minus 3 = -2.

9 of 17 – Video

Watch the following video to see a number line being used for addition and subtraction:

[Adding and subtracting on number line word problems](https://www.youtube.com/embed/EQrCdEF3vNE?autoplay=1&rel=0&start=0&modestbranding=1&showinfo=0&theme=light&fs=0&probably_logged_in=0)

10 of 17 – Using a double number line

A double number line has numbers on both sides and can be used for conversions.

Consider a number line for the following conversions (the numbers on the left represent centimetres and the numbers on the right represent millimetres):

1 = 10

2 = 20

3 = 30

4 = 40

5 = 50

6 = 60

7 = 70

8 = 80

9 = 90

10 = 100

For example, to express 5 centimetres in millimetres, you would find number 5 on the top of the number line (which has the numbers in centimetres) and identify the corresponding figure on the bottom number line (which has the number in millimetres).

This tells us that 5cm is the same as 50mm.

11 of 17 – Question 3

The equivalents for two number lines between fractions, decimals and percentages are shown below:

|  |  |
| --- | --- |
| Decimal to Percentage | Decimal to Fraction |
| 0.1 = 10%0.2 = 20%0.3 = 30%0.4 = 40%0.5 = 50%0.6 = 60%0.7 = 70%0.8 = 80%0.9 = 90%1.0 = 100% | 0.1 = $\frac{1}{10}$0.2 = $\frac{2}{10}$0.3 = $\frac{3}{10}$0.4 = $\frac{4}{10}$0.5 = $\frac{5}{10}$0.6 = $\frac{6}{10}$0.7 = $\frac{7}{10}$0.8 = $\frac{8}{10}$0.9 = $\frac{9}{10}$1.0 = 1 |

Using the above equivalents, match these figures; 30, $\frac{3}{10}$ and 0.3 to their correct type below:

1. Decimal
2. Percentage
3. Fraction

The correct answers are:

30 is a percentage.

$\frac{3}{10}$ is a fraction.

0.3 is a decimal.

12 of 17 – Finding the difference

You can also use a number line to help you find the difference between positive and negative numbers.

To do this you can simply count the number of places between the two numbers.

For example, consider a number line ranging from -5 to 5, which shows the following numbers: -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5. To find the different between -4 and 3, you would count the number of places between the two numbers. The answer is 7.

13 of 17 – Question 4

The temperature in Rome is 5°C and the temperature in Paris is -1°C. How much colder is it in Paris than Rome?

Use the number line method to help you choose the correct answer:

1. It is 6°C colder
2. It is 1°C colder
3. It is 5°C colder
4. It is 4°C colder

The correct answer is A, it is 6°C colder.

14 of 17 – Question 5

For this question, you will need to consider a longer number line, ranging from -10 to 10 e.g. -10, -9, -8, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

The temperature in the morning was -9°C but by midday it had risen to -4°C. By how much did the temperature rise?

1. It rose by 5°C
2. It rose by 4°C
3. It rose by -5°C
4. It rose by 13°C

The correct answer is A, it rose by 5°C.

15 of 17 – Question 6

Suzy has £9 in her bank account when a bill comes in for £16. What will her balance be after she pays the bill?

Use the number line method to help you answer this question and then compare it with the correct answer below.

The correct answer is: -7.

16 of 17 – Task

Download the accompanying **Positive and Negative Numbers PDF** and answer all of the questions.

Remember to complete and save your work on the PDF document.

17 of 17 – End

Well done. You have completed this session on positive and negative numbers.

You should now be able to:

* Understand positive and negative numbers in practical contexts
* Use a number line for addition and subtraction

If you are unsure or have any questions about any of these topics, make a note and speak to your tutor for more help.