Maths

Number and Place Value

Need a coherently planned sequence of lessons to complement this resource?

Negative Numbers – Temperature

Aim

- To use negative numbers in context.

Success Criteria

- I can calculate intervals across zero.
- I can solve problems involving negative numbers.

Remember It

Write calculations which give the answer -8, crossing through zero.

-20 -19 -18 -17 -16 -15 -14 -13 -12 -11 -10 -9 (-8) -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Calculating the Difference Using a Number Line

How would you calculate the difference between a negative and a positive number? Discuss this with your partner.

One method is to use an empty number line.
For example,
find the difference between 10 and -5.
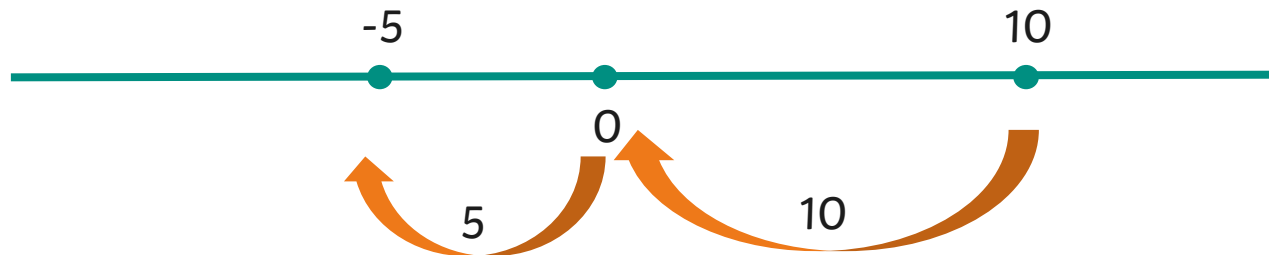
-5 is 5 away from zero. 10 is 10 away from zero.

10 + 5 = 15

The difference between 10 and -5 is 15.

Calculating the Difference Using a Number Line

Draw your own empty number line to calculate the difference between -4 and 8.
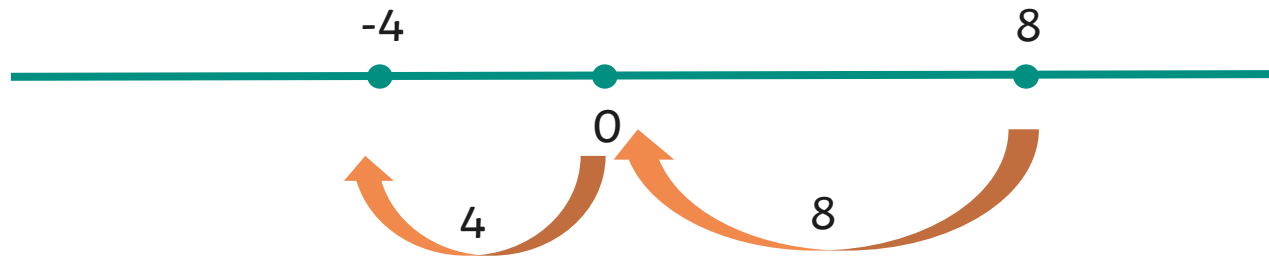
-4 is 4 away from zero. 8 is 8 away from zero.

$$4 + 8 = 12$$

The difference between -4 and 8 is 12.

Calculating the Difference Using a Number Line

-5   10

          0
      5   10
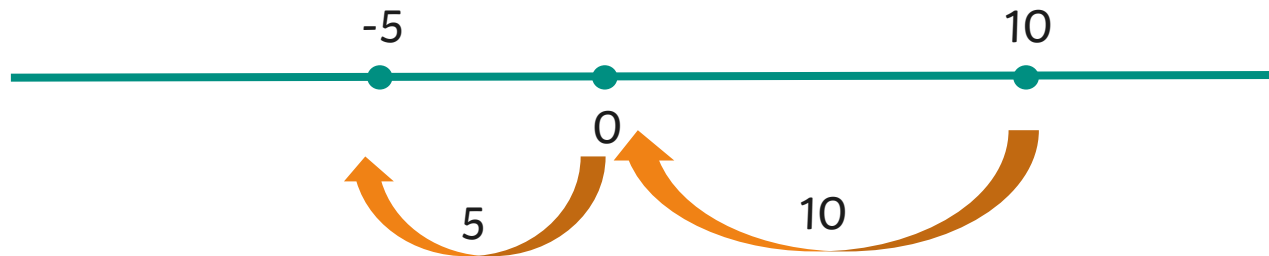
Use the number line method to calculate the difference between the following numbers:

A -8 and 12

B 16 and -9

C -14 and 15

20

25

29

Calculating the Difference Using a Number Line

Look at the answers to the calculations you have just done.

A -8 and 12 = **20**

B 16 and -9 = **25**

C -14 and 15 = **29**

? Can you visualise the way to do these calculations without using a number line?

How do I calculate the difference between a positive and a negative number?

? How would you answer this question for Sam?
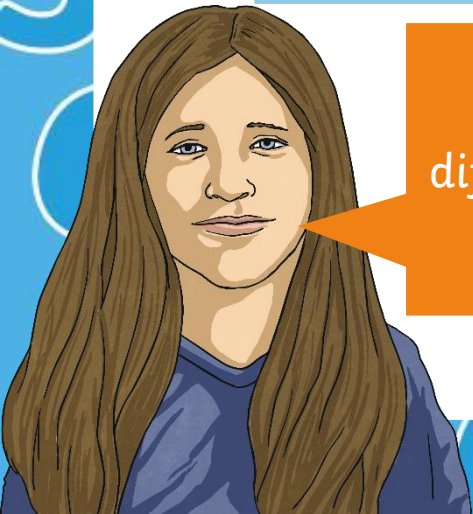
Calculating the Difference Using a Number Line

Calculate the difference between these numbers, try to do it in your head:

A 13 and -12

B 17 and -8

C 22 and -16

25

25

38

Differences Between Temperatures

Here are the minimum and maximum temperatures between different European cities in January.

City	Minimum	Maximum
Bucharest (Romania)	-6˚C	2˚C
Alicante (Spain)	6˚C	17˚C
Innsbruck (Austria)	-5˚C	3˚C
Sofia (Bulgaria)	-3˚C	2˚C

Calculate the difference between the minimum and maximum temperatures of each city.

Bucharest: 8˚C   Alicante: 11˚C   Innsbruck 8˚C   Sofia: 5˚C

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Differences Between Temperatures

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Innsbruck (Austria)	-5˚C	3˚C
Sofia (Bulgaria)	-3˚C	2˚C

? What is the difference between the **minimum** temperatures of the following cities?

A Alicante and Bucharest

B Alicante and Sofia

C Alicante and Innsbruck

12˚C

9˚C

11˚C

Differences Between Temperatures

City	Minimum	Maximum
Bucharest (Romania)	-6˚C	2˚C
Alicante (Spain)	6˚C	17˚C
Innsbruck (Austria)	-5˚C	3˚C
Sofia (Bulgaria)	-3˚C	2˚C

? What is the difference between greatest and the lowest temperature measurement in this table?

17˚C and -6˚C difference = 23˚C

Differences Between Temperatures

-0.5˚C

-3˚C

2˚C

1˚C

-1.5˚C

?

Which two temperatures have a difference of 1.5˚C?

-0.5˚C and 1˚C

Differences Between Temperatures

City	Minimum
Kazan (Russia)	-14˚C
Brighton (England)	1˚C
Athens (Greece)	7˚C
Stockholm (Sweden)	-6˚C
Madrid (Spain)	11˚C

? The maximum temperature in Kazan is 12 degrees warmer than the minimum. What is the maximum temperature of Kazan?

-2˚C

Differences Between Temperatures

City	Minimum
Kazan (Russia)	-14˚C
Brighton (England)	1˚C
Athens (Greece)	7˚C
Stockholm (Sweden)	-6˚C
Madrid (Spain)	11˚C

? The maximum temperature in Stockholm is 10 degrees warmer than the minimum. What is the maximum temperature of Stockholm?

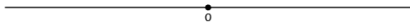**4˚C**

World Temperatures
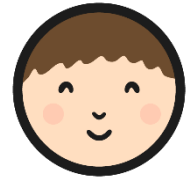
World Temperatures

To use negative numbers in context.

1. Use an empty number line to calculate the difference between a negative and a positive number.
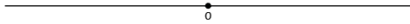
   a. 12 and -9

   0

   b. -5 and 20

   0

   c. 9 and -9

   0

2. Complete this table. Calculate the differences in minimum and maximum temperatures for each city. Show in the space under the table how you worked out your answer.
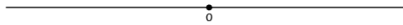
City	Minimum	Maximum	Difference
Nanjing (China)	-2°C	7°C	
Potsdam (Germany)	-3°C	2°C	
Zagreb (Croatia)	-4°C	2°C	
Salzburg (Austria)	-6°C	1°C	

World Temperatures

To use negative numbers in context.

1. Draw a number line to calculate the difference between these negative and positive numbers.

   a. -18 and 9

   0

   b. 23 and -13

   0

   c. -29 and 25

   0
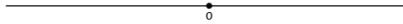
2. Here are the minimum and maximum temperatures between different cities around the world in January:

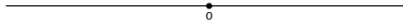| City	Minimum	Maximum
Nikko (Japan)	-8°C	0°C
Melbourne (Australia)	6°C	26°C
Turin (Italy)	-3°C	7°C
King Salmon (USA)	-13°C	-5°C
Gander (Canada)	-11°C	-3°C

World Temperatures

To use negative numbers in context.

1. Draw a number line to calculate the difference between these negative and positive numbers.

   a. -19 and 11

   0

   b. 32 and

   0

   c. -47 an

   0

Minimum
-27°C
-3°C
17°C
-14°C
18°C

Dive in by completing your own activity!

1) Draw your own number line to help you calculate the difference between these temperatures:
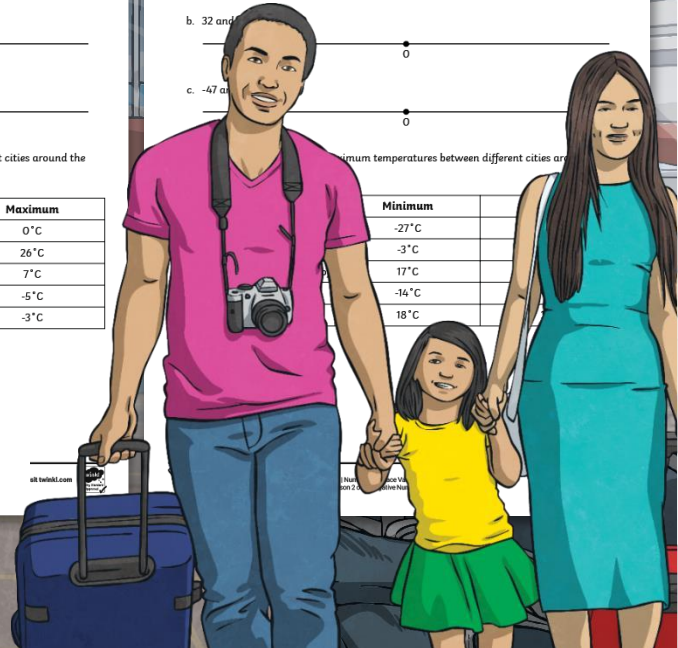
   a) 12°C and -4°C

   b) 10°C and -8°C

   c) -5°C and 7°C

   d) -11°C and 3°C
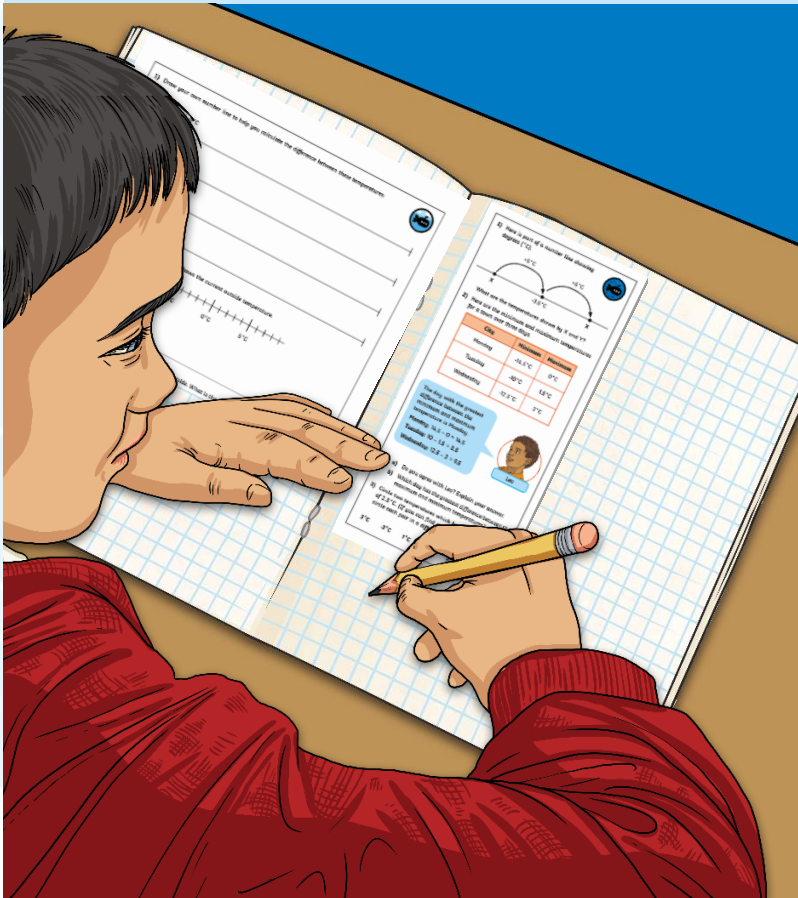
2) Here is part of a temperature scale. A shows the current outside temperature.

   -5°C   0°C   5°C

   A

   a) What is the outside temperature?

   b) The inside temperature is 24°C warmer than it is outside. What is the inside temperature?

3) Here are the minimum and maximum temperatures for two places in January.

City	Minimum	Maximum
Gander (Canada)	-11°C	-3°C
Rome (Italy)	3°C	12°C

   a) What is the difference in minimum temperatures between the places?

   b) What is the difference in maximum temperatures between the places?
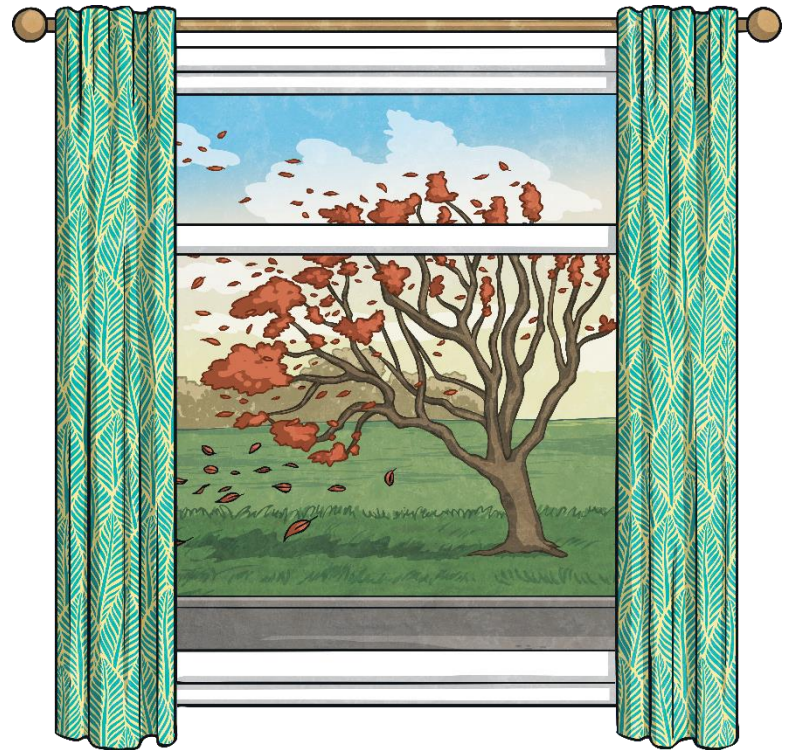
More Temperature Problems

Currently the temperature is -3˚C. It is predicted that by 2 p.m. the temperature will have risen by 9˚C. What is the predicted temperature?

6˚C

Currently the temperature is 12˚C. Five hours ago, it was 14˚C cooler. What was the temperature five hours ago?

-2˚C

More Temperature Problems

Yesterday, the minimum temperature was 2°C. This time last year it was colder by 10°C. What was the minimum temperature this time last year?

-8°C

Today is Friday and the minimum temperature is -5°C. For the next three days, the minimum temperature is set to rise by 2°C each day. What will the minimum temperature be on Monday?

1°C

Aim

- To use negative numbers in context.

Success Criteria

- I can calculate intervals across zero.
- I can solve problems involving negative numbers.

765.39528 9873

991 6789 78 096

8 562 853 2234

309 31 238 948

9 5698 435 -31

63 567 892 2 543