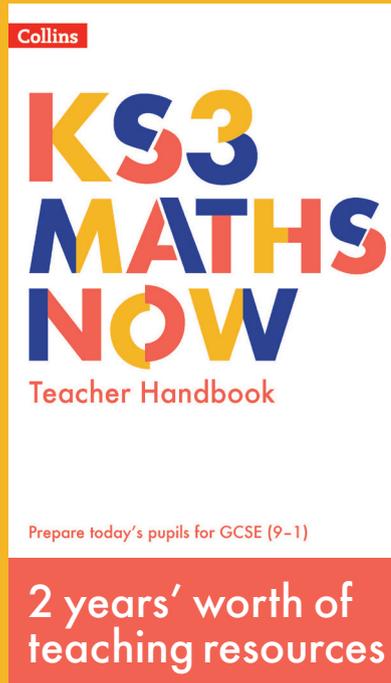
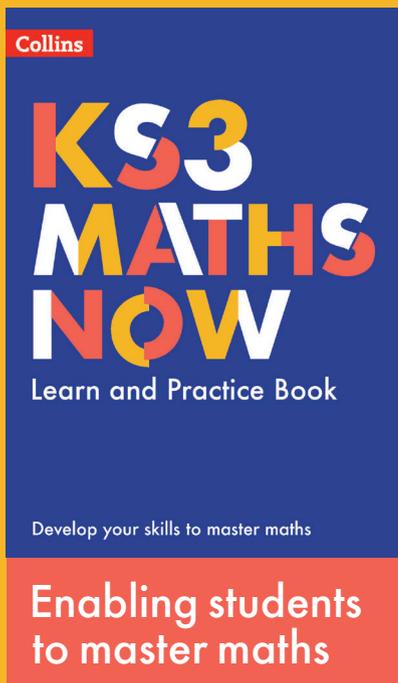


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CHAPTER 4 Negative numbers

4.1 The number line

- I can use a number line to order positive and negative numbers, including decimals
- I can understand and use the symbols $<$ (less than) and $>$ (greater than)

Develop fluency

Worked example

Which number is greater, -7 or -3 ?



Because -3 is further to the right on the number line than -7 is, it is the larger number.

Dan wrote $-6 < 4$.

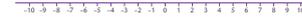
His sister said she could write the same thing but with a different sign. Explain how she could do this.

Swapping the numbers around and using the greater than sign gives $4 > -6$, which is the same thing but with a different sign.

Write these temperatures in order, from lowest to highest.

8°C , -2°C , 10°C , -7°C , -3°C , 4°C

First, draw up a number line.



Then mark the numbers on the number line.



You can see that the order is:

-7°C , -3°C , -2°C , 4°C , 8°C , 10°C

- State whether each statement is true or false.
 - $5 < 10$
 - $5 > -10$
 - $-3 > 6$
 - $3 < 6$
- Copy each statement and put $<$ or $>$ into the \square to make it true.
 - $6 \square 10$
 - $5 \square -2$
 - $-1 \square 9$
 - $-3 \square -1$
- Write down the lower temperature in each pair.
 - -1°C , -8°C
 - 2°C , -9°C
 - -1°C , 9°C
 - -3°C , -1°C
- Put these numbers in order, starting with the lowest.
 - -0.5 , 0 , -1
 - -1 , 2 , -5
 - -1.1 , -1.6 , -1.9
- Write down the greater number in each pair.
 - -1 , -3
 - -6.5 , -5.6
 - -1.2 , -2.1

40

Chapter 4

Solve problems

Worked example

Work out the number that is halfway between -3 and 2 .

Draw a number line showing both -3 and 2 .



Count 4 spaces between -3 and 2 , so halfway is 2 spaces from the -3 , which is -1 .

15 Work out the number that is halfway between the numbers in each pair.



16 Bernie took the lift. He started on floor 2. First he went up two floors to marketing. Then he took the lift down seven floors to the canteen. Then he took the lift up two floors to the boardroom. Finally he took the lift up four floors to the IT department.

On which floor is the IT department?

17 The league table shows the numbers of goals scored by each team and the goals scored against each team. The goal difference is the difference between the number of goals scored and the number of goals against.

Team	Goals for	Goals against	Goal difference
Calcusea	11		
Adderpool		7	5
Bracketburn	9	10	
Directington	4		-10

- Find Bracketburn's goal difference.
- Find the number of goals scored by Adderpool.
- Find the number of goals scored against Directington.
- Given that the total number of goals scored by all four teams is the same as the total number of goals against, find Calcusea's goal difference.

42

Chapter 4

Reason mathematically

Worked example

The deepest part of the English Channel is 174 metres below sea level.

The top of a mast of a yacht is 6 metres above sea level.

- How much higher is the top of the mast than the lowest part of the English Channel?
 - If the yacht were sat on the bottom of the English Channel, how far would the top of the mast be below sea level?
 - $174 + 6 = 180$ metres
 - $174 - 6 = 168$ metres
- 11 A fish is 12 m below the surface of the water. A fish eagle is 17 m above the water. How many metres must the bird descend to get the fish? Explain your working.
- 12 Alice and Dipesh are playing a game with a dice. The dice has the numbers -4 , -3 , -2 , -1 , 1 and 2 . They both start with a score of 20 and whatever number they roll is subtracted from their total. They take it in turns to roll the dice. The winner is the first player to score 40 or higher.
- Alice rolls -2 , -4 and 1 . What is her score?
 - Dipesh rolls 2 , 2 and -3 and Alice rolls 1 , -1 and -2 . Who is closer to 40 points?
 - What is the lowest number of rolls a player could roll to win the game?
 - Dipesh's first roll is a 2 and he wins the game in seven rolls. What possible final scores could he get?

Solve problems

Worked example

This is Laz's solution to a problem

$$(-15 + 3) - (3 - 5) = 12 - 2 = 10$$

Laz has made some errors in his calculation.

Explain where he has made errors.

$$-15 + 3 \text{ should have been } -12, 3 - 5 \text{ should have been } -2 \text{ giving the answer as } -12 - 2 = -14, -2 = -10$$

- 13 Choose a number from each list and subtract one from the other. Repeat for at least four pairs of numbers. What are the biggest and smallest answers you can find?

A	14	-17	-25	11	15
B	-23	9	-18	8	-14

48

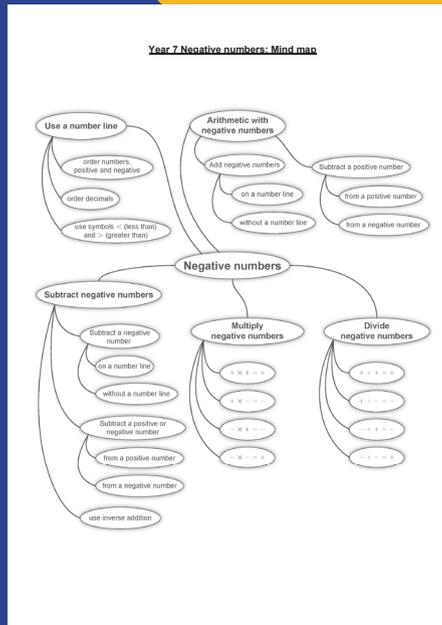
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Sets clear aims and expectations using termly schemes of learning



Demonstrate carefully sequenced and planned knowledge mapped to national curriculum objectives in the schemes of learning



Check student understanding, assess impact of teaching and build student confidence with low stakes assessments



Plan and monitor progression with target GCSE 9-1 Maths grades



Help pupils to make connections between areas of maths with topic mind maps

Year 7 Scheme of Learning					
Year 7: Negative numbers					
National Curriculum objective	Topics	Outcomes	Aim	Sample question	Sample answer
Understand and use place value for decimals, measures and integers of any size Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative	4.1 The number line	<ul style="list-style-type: none"> To use a number line to order positive and negative numbers, including decimals To understand and use the symbols < (less than) and > (greater than) 	Develop fluency	Which number is greater, -7 or -3? -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0	Because -3 is further to the right on the number line than -7 is, it is the larger number. Notice that -3 is closer to zero than -7 is.
			Reason mathematically	Dan wrote $-6 < 4$ His sister said she could write the same thing but using a different sign. Explain how she could do this.	Swapping the numbers around and using the 'greater than' sign gives $4 > -6$, which means the same but uses a different sign.
			Solve problems	Write these temperatures in order, from lowest to highest. 8°C , -2°C , 10°C , -7°C , -3°C , 4°C	First, draw up a number line. Then mark the numbers on the number line. The order is: -7°C , -3°C , -2°C , 4°C , 8°C , 10°C

YEAR 7 PERCENTAGES MINI REVIEW			
Objective	R	A	G
I can define percentage as 'number of parts per hundred'			
I can interpret a percentage change as a fraction or a decimal			
I can express one quantity as a percentage of another			
I can use percentages to compare two quantities			
I can work with percentages greater than 100%			
Develop fluency	Reason mathematically		Solve problems
Parts as percentage			
Q1 Ben spent half of 100p. What percentage did he spend?	Q2 Mia said: 60% of the keys on a piano are white and 30% are black. Can this be true? Give a reason for your answer.	Q3 In a garden, there are 20 red roses, 30 yellow roses and 50 pink roses. What percentage of the roses are yellow?	
Percentage changes			
Q4 What percentage is the same as $\frac{1}{4}$	Q5 Len said he calculates 75% by multiplying by 0.7. Is he correct? Give a reason for your answer.	Q6 $\frac{4}{5}$ of air is nitrogen. What percentage of air is not nitrogen?	
Expressed as percentage			
Q7 Theo scored 60 marks out of 80 in a test. What percentage did he score?	Q8 Sophia coloured one third of a drawing. She said that she had coloured 30%. Is she correct? Explain your answer.	Q9 In a survey, 40 people were asked what toothpaste they used. 8 said Quickfresh 12 said Cleargo 18 said whatever was on offer. The rest said they did not use any! What percentage did not use toothpaste?	
Compare quantities			
Q10 By changing these fractions into percentage, state which is the larger. $\frac{5}{8}$, $\frac{3}{5}$	Q11 Amber ate 15% of a fruit bar. Her sister ate $\frac{2}{5}$ of the bar. Who ate more? Explain how you know.	Q12 Krishnan won 53 out of 40 games he played. His target was to win 80%. By how many games did he exceed his target?	
Percentage over 100%			
Q13 What is 150% of?	Q14 The manager of a football club said, 'I want more than 100% effort from each of you. Explain what is incorrect about his statement.'	Q15 Sutina sold her bike for 120% of the price she paid for it. She sold it for £288. How much did she pay for her bike?	

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