

Year 8 Theta Mathematics 2018-2019



This booklet lists every objective you will cover this year.

To keep track of how well you have done, you need to self-assess your understanding of each objective once you have learnt it in lesson or practiced it for homework.




You should also use this booklet as a revision guide to help you prepare for your three termly assessments this year. Your assessments will be on the following dates:

Assessment	Units to be covered	Approximate date
Autumn	1 & 2	Between 12/11 and 28/11
Spring	3 - 6	Between 04/03 and 20/03
End of year	1 - 9	Between 10/06 and 21/06




Tips for revision

- Pick an objective that you did not understand. Eg. You ticked ☹️ or 😐
- Watch the mathswatch clip associated with this objective, pausing to answer the in clip questions
- Answer some interactive questions on mathswatch to get instant feedback
- Repeat this process
- Ask other students in your form
- Attend maths drop-in session

Unit 1 - Number




	Objective	Strand	Step	MW	Key Question			
1	Use written methods to add and subtract decimals	N	5	N13b, N14b	Ex 1.1 Q9			
2	Use mental calculation	N	5	N3a, N4a	Ex 1.1 Q6			
3	Calculate with money	N	5	N7c	Ex 1.1 Q11			
4	Estimate answers to calculations	N	5	N43a, N43b	Ex 1.1 Q14			
5	Add, subtract, multiply and divide positive and negative numbers	N	5	N18, N19a, N19b	Ex 1.2 Q4, 9,11			
6	Calculate using squares, square roots, cubes and cube roots	N	4	N25	Ex 1.3 Q11			
7	Give whole numbers that a square root lies between	N	5		Ex 1.3 Q5			
8	Use mental methods to calculate combinations of powers, roots and brackets	N	6		Ex 1.4 Q1			
9	Substitute numbers into formulae involving powers, roots and brackets	N	6	95	Ex 1.4 Q10			
10	Use index notation	N	4	29	Ex 1.5 Q5			
11	Write a number as a product of its prime factors	N	5	N31a	Ex 1.5 Q7			
12	Use prime factor decomposition to find the highest common factor (HCF) and lowest common multiple (LCM)	N	6	N31a, N31b	Ex 1.5 Q10, 12			

Unit 2 - Area and Volume

	Objective	Strand	Step	MW	Key Question			
1	Derive and use the formula for the area of a triangle	G&M	5	G20c	Ex 2.1 Q3			
2	Calculate the area of compound shapes made from rectangles and triangles	G&M	5	G24	Ex 2.1 Q6			
3	Derive and use the formula for the area of a parallelogram	G&M	5	G20b	Ex 2.2 Q4, 5			
4	Use the formula for the area of a trapezium	G&M	6	G20d	Ex 2.2 Q6			
5	Calculate the volumes of cubes and cuboids	G&M	5	G21a	Ex 2.3 Q7			
6	Solve volume problems	G&M	6	115	Ex 2.3 Q11			




7	Sketch nets of 3D solids	G&M	5	G12c	Ex 2.4 Q5			
8	Use 2D representations of 3D solids	G&M	6		Ex 2.5 Q3			
9	Calculate the surface area of cubes and cuboids	G&M	6	G21b	Ex 2.5 Q7			
10	Solve problems in everyday contexts involving measures	G&M	6	112	Ex 2.6 Q3			
11	Convert between different measures for area, volume and capacity	G&M	6	R2	Ex 2.6 Q9			
12	Use tonnes and hectares	G&M	5		Ex 2.6 Q10			
13	Correctly enter metric measures on a calculator	G&M	5		Ex 2.6 Q10, 11, 13			
14	Know rough metric equivalents of imperial measures	G&M	5		Ex 2.6 Q11			

Unit 3 – Statistics, graphs and charts




	Objective	Strand	Step	MW	Key Question			
1	Interpret pie charts	S	4	128a	Ex 3.1 Q3			
2	Draw pie charts	S	5	S9	Ex 3.1 Q6			
3	Calculate the mean from a frequency table	S	5	S10a	Ex 3.2 Q4			
4	Design and use two-way tables	S	4	P4	Ex 3.2 Q6			
5	Design and use tables for grouped data	S	5	S4	Ex 3.2 Q9			
6	Draw stem and leaf diagrams for data	S	6	129	Ex 3.3 Q3			
7	Interpret stem and leaf diagrams	S	6	129	Ex 3.3 Q6			
8	Comparing two sets of data using statistics or the shape of the graph	S	6		Ex 3.4 Q1, 2			
9	Construct line graphs	S	5	96	Ex 3.4 Q5			
10	Choose the most appropriate average to use	S	6		Ex 3.4 Q7			
11	Draw a scatter graph	S	6	S8	Ex 3.5 Q5			
12	Draw a line of best fit on a scatter graph	S	6	S8	Ex 3.5 Q7			
13	Describe types of correlation	S	5	S8	Ex 3.5 Q5			
14	Interpret graphs and charts	S	5	S1a, S2a	Ex 3.6 Q1			

15	Explain why a graph or chart could be misleading	S	6		Ex 3.6 Q5			
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Unit 4 – Expressions and Equations




	Objective	Strand	Step	MW	Key Question			
1	Understand and simplify algebraic powers	A	6	A7a, A7b	Ex 4.1 Q5			
2	Substitute values into formulae involving powers	A	6	95	Ex 4.1 Q9			
3	Expand brackets	A	5	A8	Ex 4.2 Q3			
4	Make and simplify algebraic expressions	A	6	7	Ex 4.2 Q7			
5	Factorise expressions	A	6	A9	Ex 4.3 Q8			
6	Find the inverse of a simple function	A	6	N26	Ex 4.4 Q2			
7	Solve simple equations using function machines	A	4		Ex 4.4 Q5			
8	Solve real-life problems using equations	A	5	A17	Ex 4.4 Q10			
9	Solve two-step equations using function machines	A	5		Ex 4.5 Q4			
10	Solve real-life problems using equations	A	5	A17	Ex 4.5 Q7			
11	Solve equations using the balancing method	A	5	A12	Ex 4.6 Q6			

Unit 5 – Real –life graphs




	Objective	Strand	Step	MW	Key Question			
1	Draw, use and interpret conversion graphs	A	6	A21b	Ex 5.1 Q5			
2	Interpret a distance-time graph	A	5	A21a	Ex 5.2 Q3			
3	Draw a simple distance-time graph	A	6	A21a	Ex 5.2 Q5			
4	Draw and use graphs to solve distance-time problems	A	6	A21a	Ex 5.2 Q6			
5	Draw and interpret line graphs	A	5	96	Ex 5.3 Q5			
6	Interpret information from a complex real-life graph, read values and discuss trends	A	5	A21b	Ex 5.4 Q5			
7	Discuss and interpret line graphs and graphs of functions from a range of sources	A	6	A21b	Ex 5.5 Q2			
8	Plot the graphs of a function derived from a real life problem	A	5	A21b	Ex 5.5 Q5			

9	Discuss and interpret linear and non-linear graphs from a range of sources	A	6		Ex 5.6 Q4, 5			
10	Solve real-life problems by drawing graphs	A	6	A21b	Ex 5.6 Q7			

Unit 6 - Decimals and ratio




	Objective	Strand	Step	MW	Key Question			
1	Round numbers to an appropriate degree of accuracy	N	6	N27a, N27b, N38	Ex 6.1 Q7			
2	Order positive and negative numbers including decimals	N	5	N2a, N2b	Ex 6.1 Q10			
3	Multiply larger numbers	N	6	N28a	Ex 6.2 Q4			
4	Multiply decimals with up to two decimal places	N	6	N28b, N40a	Ex 6.2 Q5			
5	Multiply any number by 0.1 and 0.01	N	6		Ex 6.2 Q9			
6	Add and subtract decimals of any size	N	6	N13b, N14b	Ex 6.3 Q8			
7	Multiply and divide by decimals	N	6	N15b, N40a, N40b	Ex 6.3 Q5, 6			
8	Divide by 0.1 and 0.01	N	6		Ex 6.3 Q13			
9	Use ratios involving decimals	R	5	R1a, R5a, R5b	Ex 6.4 Q4			
10	Solve proportion problem	R	6	R8	Ex 6.4 Q9			
11	Solve engineering problems using ratio and proportion	R	6	R4	Ex 6.5 Q3			
12	Use unit ratios	R	5	R4	Ex 6.5 Q6			

Unit 7 - Lines and angles




	Objective	Strand	Step	MW	Key Question			
1	Classify quadrilaterals by their geometric properties	G&M	5	G14	Ex 7.1 Q1			
2	Solve geometric problems using side and angle properties of special quadrilaterals	G&M	6		Ex 7.1 Q5			
3	Identify alternate angles on a diagram	G&M	5	G18	Ex 7.2 Q5			
4	Understand a proof that the sum of the angles of a triangle is 180 and of a quadrilateral is 360.	G&M	6	G23	Ex 7.2 Q7, 8			

5	Solve geometrical problems using side and angle properties of triangles and quadrilaterals	G&M	6	G16	Ex 7.3 Q6			
6	Identify corresponding angles	G&M	5	G18	Ex 7.3 Q8			
7	Solve simple problems using properties of angles in parallel and intersecting lines	G&M	6	G18	Ex 7.3 Q9			
8	Calculate the sum of the interior and exterior angles of a polygon	G&M	6	G19	Ex 7.4 Q2			
9	Calculate the interior and exterior angles of a polygon	G&M	6	123	Ex 7.4 Q3			
10	Solve problems involving angles by setting up equations	G&M	6		Ex 7.5 Q4			
11	Solve geometrical problems showing reasoning	G&M	6		Ex 7.5 Q10			

Unit 8 – Adding and subtracting fractions




	Objective	Strand	Mountain descriptor	MW	Key Question			
1	Add and subtract fractions with any size denominator	N	4	N36, N41	Ex 8.1 Q7			
2	Multiply integers and fractions by a fraction	N	6	N37a, N42a	Ex 8.2 Q3			
3	Use appropriate methods for multiplying fractions	N	6	N37a, N42a	Ex 8.2 Q11			
4	Convert fractions to decimals	N	6	84	Ex 8.3 Q8			
5	Write one amount as a fraction of another	N	6	R3	Ex 8.3 Q6			
6	Find the reciprocal of a number	N	6	76	Ex 8.3 Q12			
7	Divide integers and fractions by a fraction	N	7	N37b, N42b	Ex 8.3 Q5, 8			
8	Use strategies for dividing fractions	N	7	N37b, N42b	Ex 8.4 Q5,8			
9	Use the four operations with mixed numbers	N	7	N35	Ex 8.5 Q3, 6, 8, 11			

Unit 9 – Straight-line graphs

	Objective	Strand	Step	MW	Key Question			
1	Recognise when values are in direct proportion	R	5	R8	Ex 9.1 Q2			
2	Plot graphs and read values to solve problems	R	6		Ex 9.1 Q9			
3	Plot a straight-line graph and work out its gradient	A	6	R14b	Ex 9.2 Q9			

4	Plot the graphs of linear functions	A	6	R14a	Ex 9.3 Q4			
5	Find midpoints of line segments	A	6	133	Ex 9.3 Q3			
6	Write the equations of straight-line graphs in the form $y = mx + c$	A	6	R14c	Ex 9.3 Q7			
7	Identify and describe practical examples of direct proportion	R	6		Ex 9.4 Q2			
8	Solve problems involving direct proportion with or without a graph	R	6		Ex 9.4 Q4			

Unit 10 - Fractions and decimals

	Objective	Strand	Step	MW	Key Question			
1	Recall equivalent fractions and decimals	N	5	N32	Ex 10.1 Q2			
2	Recognise recurring and terminating decimals	N	5		Ex 10.1 Q6, 9			
3	Order fractions by converting them to decimals or equivalent fractions	N	6	N34	Ex 10.1 Q16			
4	Recall equivalent fractions, decimals and percentages	N	5	N32	Ex 10.2 Q2			
5	Use different methods to find equivalent fractions, decimals and percentages	N	5	N32	Ex 10.2 Q2			
6	Use the equivalence of fractions, decimals and percentages to compare proportions	N	6		Ex 10.2 Q6			
7	Express one number as a percentage of another	R	5		Ex 10.3 Q6			
8	Work out a percentage increase or decrease	R	6	R9a	Ex 10.3 Q12			
9	Use a multiplier to calculate percentage increase and decrease	R	6	R9b	Ex 10.4 Q9			
10	Use the unitary method to solve percentage problems	R	7		Ex 10.4 Q11			
11	Use strategies for calculating fractions and decimals of a given number	N	6		Ex 10.5 Q3			
12	Use mental strategies of conversion and equivalence of fractions, decimals and percentages to solve word problems mentally	N	6		Ex 10.5 Q7			