Year 7 Maths: Personalised Learning Checklist (PLC) – Core & Extension

Learning Journey

7.1	Numbers & the Number System 1
7.2	Measuring 1
7.3	Calculating 1
7.4	Manipulating 1
7.5	Angles 1
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7.7	Representing 1
7.8	2D & 3D Shapes 1
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7.11	Units 1
7.12	Perimeter, Area & Volume 1
7.13	Ratio 1
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7.16	Analysing 1
7.17	Fractions 2
7.18	Symmetry & Transformations 1
7.19	Probability 1

Unit 1 – Numbers & the Number System 1	**MathsWatch**
Find multiples of a number	N11
Find lowest common multiples of numbers	N31b
Find factors of a number	N10
Find highest common factor of numbers	N31a
Recognise the prime numbers 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, …	N30a
Find the prime factors of a number using a calculator	
Find the prime factors of a number using a factor tree	N30b
Recognise and use square numbers 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, …	N25
Recognise and use cube numbers 1, 8, 27, 64, 125, …	N25
Read, write and evaluate powers	
Find square roots, cube roots and other roots (including use of $\sqrt{}$ and $\sqrt[3]{}$)	N25
Use a scientific calculator to find powers and roots	N44

Key Vocabulary		**Careers**
Multiple Lowest Common Multiple (LCM) Factor Highest Common Factor (HCF) Divisible Prime Prime Factor Decomposition Product Factor Tree	Square Number Cube Number Index (Power) Exponent (Power) Indices (Powers) Square Root Cube Root Root	• Cyber Security • Computer Programming • Construction • Distribution and Resource Management  **Career Transferable Skill** **Problem Solving Skills.** Be flexible and approach the same problem from different points of view.

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Unit 2 – Measuring 1	**MathsWatch**
Name different types of angles: Acute – less than 90 degrees Right – 90 degrees Obtuse – between 90 and 180 degrees Reflex – over 180 degrees	G10a G13
Estimate the size of different types of angles	
Use a protractor to measure and draw angles Know the label for a right angle Understand and use labelling notation for angles	G10a G10b G10c
Use a ruler to measure and draw line segments Understand and use labelling notation for lengths Know the label for parallel lines and equal lengths	G1
Use compasses to draw arcs and circles	
Use ruler and protractor to construct a triangle from a description	G15

Key Vocabulary		**Careers**
Acute Right Angle Obtuse Reflex Full Turn Vertex Arm Degree Estimate	Ruler Protractor Compasses Accurate Construct Measure Line Segment Parallel Equal Arc Circle	• Architects • Visual Design • Construction and Installation • Production  **Career Transferable Skill** Useful Personality Traits. Creativity

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Unit 3 – Calculating 1	**MathsWatch**
Add whole numbers (integers) and decimals	N3b, N13a, N13b
Subtract whole numbers and decimals	N4b N14a, N14b
Multiply with whole numbers	N5 N15a, N28a
Divide a whole number or decimal by a one or two digit number	N6, N16 N29a, N29b
Use negative numbers in context such as temperature	N18
Use the signs <, > to compare negative numbers	N9
Use a compound inequality to compare numbers (e.g. -1 < 0.5 < 4)	N9
Add and subtract with negative numbers	N19a
Multiply and divide with negative numbers	N19b
Order of operations (BIDMAS)	N20
Use a scientific calculator	N44

Key Vocabulary	
Operation	Order of operations
Add	Brackets
Sum	Indices
Total	Evaluate
Subtract	Negative
Difference	Positive
Multiply	Integer
Product	Decimal
Divide	Increase
Quotient	Decrease
Inverse operation	Inequality
Estimate	Interval

Careers

- Finance and Human Resources
- Computer Programming
- Data Entry
- Healthcare
- Management



Career Transferable Skill

Good Working Habits.

Be thorough and painstaking in your work.

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Unit 4 – Manipulating 1	**MathsWatch**
Recognise: expression, equation, inequality, term, formulae, function	A2
Know and use basic algebraic notation ('rules' of algebra): ab in place of a x b 3y in place of y + y + y and 3 x y a^2 in place of a x a a^3 in place of a x a x a $\frac{a}{b}$ in place of a ÷ b use of brackets	A4
Write simple expressions from words	A4
Simplify expressions (collecting like terms)	A6
Simplify expressions using multiply and divide	A7a, A7b
Expand a single bracket	A8
Substitute positive numbers into expressions and formulae	A10
Use function machines to work out outputs and inputs	N26

Key Vocabulary	
Algebra	Simplify
Variable	Collect Like Terms
Expression	Like Terms
Equation	Unlike Terms
Inequality	Indices
Formula	Substitute
Term	Evaluate
Function	Expand
Coefficient	Input / output
Constant	Rearrange
	Changing the subject

Careers

- Computer Programmers
- Engineering (all types)
- Finance – Economists, planner, accountants.
- Scientists



Career Transferable Skill

Communication Skills

Write mathematics well.

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Unit 5 – Angles 1	**MathsWatch**
Recognise and use angle rule: vertically opposite angles are equal	G13
Recognise and use angle rule: angles around a point add to 360°	G13
Recognise and use angle rule: angles at a point on a line add to 180°	G13
Know that the angles in a triangle add to 180 degrees	G13, G17
Know that the angles in an equilateral triangle are 60 degrees	G16
Find missing angles in isosceles triangles	G16, G17
Know that the angles in a quadrilateral add up to 360 degrees	

Key Vocabulary		**Careers**
Angle Degree Full turn Vertically Opposite Adjacent Triangle Equilateral triangle Isosceles triangle Scalene triangle Quadrilateral		• Architects including landscape • Construction work • Electrical and vehicle installation • Engineering • Games programmer and Visual Design • Sports  **Career Transferable Skill** **Analytical Skills.** Pay attention to detail.

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Unit 6 – Place Value 1	**MathsWatch**
Use the signs <, ≤, >, ≥, =, ≠ to compare numbers < (less than) ≤ (less than or equal to) > greater than ≥ greater than or equal to = equal to ≠ not equal to Use a compound inequality (e.g. -1 < 0.5 < 4)	N9 A20a
Read and write numbers, identify values of digits	N1a, N1b
Order a set of integers (whole numbers) and decimals	N2a, N2b
Multiply an integer or decimal by a power of 10	N17a, N17b
Divide an integer or decimal by a power of 10	N17a, N17b
Round a number to the nearest 1000, 100, 10 or whole number	N27a
Round a number to a specified number of decimal places	N27b

Key Vocabulary		**Careers**
Inequality Compound inequality Greater than (>) Less than (<) Greater than or equal to (≥) Less than or equal to (≤) Not equal to (≠) Between Digit Place value Units or ones Ten Hundred Thousand Ten thousand Hundred thousand Million	Tenths Hundredths Thousandths Decimal Decimal point Order Compare Ascending Descending Round Round up Round down Nearest Decimal place	• Business and Finance • Management • Sports • Data Science  **Career Transferable Skill** **Analytical Skills.** Pay attention to detail

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Unit 7 – Representing 1	**MathsWatch**
Know the difference between discrete and continuous data • Discrete data is data which can be listed or counted • Continuous data is measured data	(GCSE) 63
Know the difference between primary and secondary data • Primary data is data you have collected yourself • Secondary data has been collected by someone else	
Know the difference between qualitative and quantitative data • Qualitative data is descriptive • Quantitative data is numerical	
Construct and interpret frequency tables	S3, S4
Construct and interpret pictograms	S1a, S1b
Construct and interpret bar charts	S2a, S2b, S5
Construct and interpret vertical line charts	(GCSE) 64
Construct and interpret pie charts	S9

Key Vocabulary		**Careers**
Data Sample Discrete Continuous Primary Secondary Qualitative Quantitative Interpret Frequency Frequency table Tally chart Scale Label Plot	Pictogram Key Bar chart Width Height Gap Vertical line chart Pie chart Sector Category Proportion Percentage	• Marketing • Business and Finance • Social Science • Sports • Media including journalism • And many more….



Career Transferable Skill

Analytical Skills

Construct logical arguments and expose illogical ones.

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Unit 8 – 2D & 3D Shapes 1	**MathsWatch**
Line symmetry	G3
Rotational symmetry	G7
Properties of scalene/isosceles/equilateral triangles	G16
Names and properties of different quadrilaterals	G14
Names of 2D shapes based on the number of sides	G1
Vocabulary for circle parts	G2
Know the names and properties of 3D shapes	G12a
Planes of symmetry in 3D shapes (these cut a 3D shape into 2 equal and symmetrical halves)	
Number of faces, edges and vertices of a 3D shape	G12b
Know the link between faces, edges and vertices in a 3D shape	
Nets of 3D shapes (identify shapes from nets or draw nets)	G12c

Key Vocabulary		**Careers**
Line of symmetry Rotational symmetry Rotate Order Scalene triangle Isosceles triangle Equilateral triangle Equal Square Rectangle Parallelogram Rhombus Trapezium Kite Opposite Parallel Adjacent Arc	Circumference Radius Diameter Sector Chord Segment Tangent Face Edge Vertex (vertices) Net Cube Cuboid Prism Cylinder Pyramid Cone Sphere	• Construction • Games Design including illustration and animation • Engineers • Architects including Interior Design • Fashion • Marketing including advertising



Career Transferable Skill

Useful Personality Traits.

Creativity

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Unit 9 – Equations 1	**MathsWatch**
Rewrite problems using algebra notation	A4
Solve an equation with one step	A12
Solve an equation with two or more steps	A12
Solve an equation where you need to expand brackets	A19a
Solve equations where the solution is a positive or negative integer, or fraction.	A12
Solve equations where the unknown is the numerator of a fraction	A19a

Key Vocabulary		**Careers**
Algebraic expression Represent Variable Unknown Term Coefficient Constant Operation Inverse operation Equation Linear equation	Equal Balance Solve Step Solution Value Expand Simplify Check	• Engineering (all types) • Finance and Accounting • Computer Programming • Scientist • Operational Research  **Career Transferable Skill** **Problem Solving Skills.** Present a solution clearly, making your assumptions explicit.

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Unit 10 – Fractions 1	**MathsWatch**
Shade or interpret fraction diagrams	N23a
Construct fractions	R3
Convert between improper and mixed numbers	N35
Equivalent fractions	N23b
Simplify fractions	N23c
Order fractions using common denominators or by writing as decimals	N34
Know fractions represent division with decimal answers	
Convert between fractions and decimals with or without a calculator	N32 (GCSE) 84
Find a fraction of an amount with or without a calculator	N33

Key Vocabulary		**Careers**
Fraction Whole Part Equal parts Numerator Denominator Proper fraction Improper fraction Mixed number Unit fraction Equivalent	Simplify Cancel Factor Highest common factor (HCF) Lowest terms Compare Order Common denominator Convert Decimal Quotient	• Healthcare • Sales • Food related careers • Agriculture • Construction and Vehicle Maintenance  **Career Transferable Skill** **Analytical Skills.** Manipulate precise and intricate ideas.

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Unit 11 – Units 1	**MathsWatch**
Convert between metric units of length 1 km = 1000 m 1 m = 100 cm or 1 m = 1000 mm 1 cm = 10 mm	N7a R2 N1c
Convert between metric units of mass 1 tonne = 1000 kg 1 kg = 1000 g 1 g = 1000 mg	N7a R2 N1c
Convert between metric units of volume and capacity 1 litre = 1000 ml or 1 litre = 100 cl 1 cl = 10 ml	N7a R2 N1c
Convert units of length, mass and capacity	R2
Using clocks Convert between times in AM and PM	N7b
Convert units of time 1 day = 24 hours 1 hour = 60 minutes 1 minute = 60 seconds	N7b
Use and interpret bus, train or other timetables	N21b
Use calendars 1 year = 12 months or 365 days (366 in a leap year)	
Convert between units of money	N7c

Key Vocabulary		**Careers**
Metric Unit Convert, conversion Length Distance Height Width Millimetre Centimetre Metre Kilometre Mass Weight Tonne Kilogram Gram Milligram Capacity	Volume Litre Millilitre Centilitre Hour Minute Second Timetable Arrival Departure Year Month Week Day Money Change Budget Cost Price	• Scientists • Medical professions • Construction • Chefs • Graphic Design • And many more!  **Career Transferable Skill** **Deductive Reasoning** The ability to apply general rules to specific problems to produce answers that make sense

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Unit 12 – Perimeter, Area & Volume 1	**MathsWatch**
Find the perimeter of a shape or composite shape	G8a, G8b
Area of a rectangle = length x width	G20a
Area of a triangle = $\frac{1}{2}$ x base x height	G20c
Area of a parallelogram = base x height	G20b
Area of a trapezium = $\frac{1}{2}$ (a + b) x height	G20d
Area of compound shapes involving triangles and rectangles	G24
Volume of a cuboid = length x width x height	G21a
Find the surface area of a cuboid	G21b

Key Vocabulary		**Careers**
Perimeter Length Width Side Distance Units Base Height Dimensions Formula Area Square units Perpendicular Compound shape Volume Surface area Cubic units Cross-section		• Construction • Dentist • Surveyor • Architect • Animation and art-based careers  **Career Transferable Skill** **Critical thinking** Observation, analysis and inference

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Unit 13 – Ratio 1	**MathsWatch**
Use ratio notation to describe the comparison of quantities	R1a, R1b
Simplify ratios, including those with units	R5a
Convert between ratios and fractions	
Be familiar with a ratio table and multipliers	
Find missing values when given a ratio and the whole or one part	R5b

Key Vocabulary		**Careers**
Ratio Part Whole Equivalent Simplify Scale factor Proportion Fraction Convert Share		• Finance including bank, stocks and shares • Design including graphic, art and interior • Cookery • Construction



Career Transferable Skill

Information Ordering

The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules

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Unit 14 – Percentages 1	**MathsWatch**
Know that percentage means parts per hundred	N24a
Write a percentage as a fraction and decimal	N24a
Know simple conversions between fractions, decimals and percentages	N32
Convert between fractions, decimals and percentages with or without a calculator	N32
Know the calculator converter function keys	
Find a percentage of an amount without a calculator	N24b
Calculate the percentage of an amount with a calculator using a decimal or fraction multiplier	
Solve problems in context by finding a percentage of an amount	
Increase or decrease by a percentage without a calculator	R9a
Complete percentage increase/decrease questions using a calculator	R9b
Use fraction/decimal multipliers to increase or decrease by a percentage	R9b
Solve problems in context using a calculator	

Key Vocabulary		**Careers**
Percentage Per cent Whole Part Value Proportion Fraction Decimal Convert Equivalent Multiplier Scale factor Multiply Divide Calculate Increase Decrease	Original Profit Loss Discount Sale Interest	• Finance including bank accounts! • Fashion and Sports • Sales including retail, real estate and travel • Administration – Data, Human Resources and office work



Career Transferable Skill

Communication Skills.

Develop your capacity to assimilate and communicate highly technical information.

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Unit 15 – Sequences 1	**MathsWatch**
Know that a sequence is a list of terms formed from a rule	N12
Use a term-to-term rule to generate a linear or non-linear sequence	A11a
Find term-to-term rules and continue sequences	N12, A11a
Understand and recognise an arithmetic sequence (the term-to-term rule involves addition or subtraction)	
Recognise a sequence of diagrams and draw the next	

Key Vocabulary		**Careers**
Sequence Term Pattern Rule Generate Continue Ascending Descending Difference Ratio Multiplier Rule Term-to-term rule Position Position-to-term rule Arithmetic sequence Common difference		• Finance and Business • Scientists • Production • Agriculture



Career Transferable Skill

Information Ordering

The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules

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Unit 16 – Analysing 1	**MathsWatch**
Understand that averages offer a summary of a set of data	S6
Find the mode of a list of data Mode = value that occurs the most frequently	S6
Find the mode from a bar chart or pictogram	
Find the median of a list of data Median = middle value when data is in order	S6
Calculate the mean of a list of data Mean = total of all values divided by number of values	S7
Understand the range measures spread of data (or consistency)	S6
Calculate the range from a set of data Range = largest value – lowest value	S6
Calculate the range from a bar chart or pictogram	
Be familiar with the term outlier and the effect on range Outlier = value much larger or smaller than the others	
Compare sets of data, and understand the limitations of different statistics	
Calculate the mode, range or mean from a discrete frequency table	S10a

Key Vocabulary		**Careers**
Data Sample Statistics Distribution Frequency Average Typical Representative Mode Modal value Most frequent value No mode Median Ordered Middle value	Mean Total Sum Range Spread Consistent Consistency Maximum Minimum Difference Compare Outlier Limitation	• Marketing • Business and Finance • Social Science • Sports • Media including journalism • And many more….



Career Transferable Skill

Analytical Skills

Construct logical arguments and expose illogical ones.

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Unit 17 – Fractions 2	**MathsWatch**
Add and subtract fractions with different denominators	N36, N41
Add and subtract mixed fractions	N41
Multiply an integer by a fraction Multiply two fractions together	N37a, N42a
Multiply by a mixed fraction	N42a
Divide an integer by a fraction Divide a fraction by an integer Divide a fraction by a fraction	N37b, N42b
Divide with mixed fractions	N42b
Use a calculator to complete fraction or mixed fraction calculations	N44

Key Vocabulary		**Careers**
Fraction Proper fraction Improper fraction Mixed number Numerator Denominator Common denominator Equivalent fraction Simplify Cancel Factor Highest common factor Lowest terms Product Reciprocal		• Healthcare • Sales • Business • Agriculture • Construction and Vehicle Maintenance  **Career Transferable Skill** **Problem Solving Skills** Tackle a problem with confidence, even when the solution is not obvious.

Year 7 Maths: Personalised Learning Checklist (PLC) – Core & Extension

Learning Journey

7.1	Numbers & the Number System 1
7.2	Measuring 1
7.3	Calculating 1
7.4	Manipulating 1
7.5	Angles 1
7.6	Place Value 1
7.7	Representing 1
7.8	2D & 3D Shapes 1
7.9	Equations 1
7.10	Fractions 1
7.11	Units 1
7.12	Perimeter, Area & Volume 1
7.13	Ratio 1
7.14	Percentages 1
7.15	Sequences 1
7.16	Analysing 1
7.17	Fractions 2
7.18	Symmetry & Transformations 1
7.19	Probability 1

Unit 18 – Symmetry & Transformations 1	**MathsWatch**
Plot coordinates in all 4 quadrants	A1a, A1b
Solve problems relating to coordinates	
Identify a horizontal or vertical graph based on its equation	
Draw a horizontal or vertical graph from the equation	
Draw and identify $y = x$ and $y = -x$ graphs	
Draw reflections of 2D shapes	G4a, G4b
Draw translations of 2D shapes	G5
Draw rotations of 2D shapes	G6
Solve problems involving rotations, reflections and translations	

Key Vocabulary		**Careers**
Coordinate Plot Horizontal Vertical Diagonal Equation Graph Reflection Reflect Symmetrical Object Image Congruent	Rotation Rotate Clockwise Anticlockwise Angle of rotation Translation Translate Right Left Up Down Vector	• Computer Games Design • Animation • Art related careers • Architecture • Advertising  **Career Transferable Skill** **Useful Personality Traits.** Creativity

Year 7 Maths: Personalised Learning Checklist (PLC) – Core & Extension

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7.16	Analysing 1
7.17	Fractions 2
7.18	Symmetry & Transformations 1
7.19	Probability 1

Unit 19 – Probability 1	**MathsWatch**
Understand probability phrases	P1
Understand the 0 – 1 probability scale	P1
Understand randomness, fairness and bias	
Understand equally or unequally likely events	
Calculate probability and write it as a fraction, decimal or percentage	P2a
Draw and use sample space diagrams	P2b

Key Vocabulary		**Careers**
Probability Chance Likelihood Impossible Unlikely Likely Even chance Certain Random Fair Biased Event Outcome Frequency Equally likely Sample space		• Scientists • Market Research • Finance • Statisticians • And many more!  **Career Transferable Skill** **Analytical Skills.** Construct logical arguments and expose illogical ones