**Primary Mathematics Scheme of Work: Stage 2**

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| *Unit* | *Lessons* | *Key ‘Build a Mathematician’ (BAM) Indicators* | *Essential knowledge* |
| [Numbers and the number system](#NNS) | 8 | * [Read and write numbers up to 100 in numerals and in words](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M1_BAM.pdf)
* [Compare and order whole numbers up to 100](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M2_BAM.pdf)
* [Count from zero in multiples of 2, 3 and 5](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M3_BAM.pdf)
* [Count in tens from any number, forwards and backwards](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M4_BAM.pdf)
* [Add and subtract numbers including a two-digit number and ones, a two-digit number and tens, two two-digit numbers, and three one-digit numbers](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M5_BAM.pdf)
* [Derive addition and subtraction facts to 100 using known facts to 20](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M6_BAM.pdf)
* [Write multiplication and division statements using correct symbols](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M7_BAM.pdf)
* [Understand that addition and multiplication of two numbers can be done in any order (commutative) and subtraction and division cannot](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M8_BAM.pdf)
* [Recognise and name the fractions 1/3, 1/4, 2/4, 3/4](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M9_BAM.pdf)
* [Tell the time to the nearest five minutes using an analogue clock, including ‘quarter past’ and ‘quarter to’.](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M10_BAM.pdf)
* [Use a ruler to measure lengths in millimetres and centimetres](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M11_BAM.pdf)
* [Identify and describe 2D and 3D shapes](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M12_BAM.pdf)
* [Use mathematical vocabulary to describe position, direction and movement](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M13_BAM.pdf)
 | * Know the place value headings of ones and tens
* Know that zero is a placeholder
* Know the symbols =, <, >, ×, ÷
* Know the meaning of odd and even numbers
* Know doubles and halves up to 20
* Know addition and subtraction facts to 20
* Know multiplication facts for the 2, 5 and 10 multiplication tables
* Know division facts related to the 2, 5 and 10 multiplication tables
* Know that 60 minutes = 1 hour
* Know that 24 hours = 1 day
* Know the symbols for pounds (£) and pence (p)
* Know the standard units for length (m, cm), mass (kg, g), temperature (°C) and capacity (litres/ml)
* Know the names and number of sides of 2D shapes
* Known the meaning of ‘edges’, ‘faces’ and ‘vertices’
* Know the names and number of faces of 3D shapes
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| [Counting and comparing](#CC) | 8 |
| [Investigating properties of shapes](#IPS) | 12 |
| [Calculating: addition and subtraction](#CAS) | 16 |
| [Exploring time](#ET) | 8 |
| [Calculating: multiplication and division](#CMD) | 16 |
| [Exploring fractions](#EF) | 12 |
| [Mathematical movement](#MM) | 8 |
| [Measuring space](#MS) | 16 |
| [Exploring money](#EM) | 8 |
| [Presentation of data](#PD) | 12 |
| Preventing the gap / Going deeper | 16 |  |  |
| Total: | 140 | [Stage 2 BAM Progress Tracker Sheet](http://kangaroomaths.com/free_resources/planning/stage2_tracker.pdf) |  |

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| **Maths Calendar** | *Based on 4 maths lessons per week, with at least 35 'quality teaching' weeks per year*  |
| Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 | Week 13 |
| [Numbers and the number system](#NNS) | [Counting and comparing](#CC) | [Investigating properties of shapes](#IPS) | [Calculating: addition and subtraction](#CAS) | [Exploring time](#ET) |
| [2M1 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M1_BAM.pdf) | [2M2 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M2_BAM.pdf)**,** [2M3 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M3_BAM.pdf)**,** [2M4 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M4_BAM.pdf) | [2M12 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M12_BAM.pdf) | [2M5 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M5_BAM.pdf)**,** [2M6 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M6_BAM.pdf) | [2M10 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M10_BAM.pdf) |
| Week 14 | Week 15 | Week 16 | Week 17 | Week 18 | Week 19 | Week 20 | Week 21 | Week 22 | Week 23 | Week 24 | Week 25 | Week 26 |
| Assessment and enrichment | [Calculating: multiplication and division](#CMD) | [Exploring fractions](#EF) | [Mathematical movement](#MM) | Preventing the gap / Going deeper |
|  | [2M7 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M7_BAM.pdf)**,** [2M8 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M8_BAM.pdf) | [2M9 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M9_BAM.pdf) | [2M13 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M13_BAM.pdf) |  |
| Week 27 | Week 28 | Week 29 | Week 30 | Week 31 | Week 32 | Week 33 | Week 34 | Week 35 | Week 36 | Week 37 | Week 38 | Week 39 |
| Assess / enrich | [Measuring space](#MS) | [Exploring money](#EM) | [Presentation of data](#PD) | Assess / enrich | Preventing the gap / Going deeper |
|  | [2M11 BAM](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M11_BAM.pdf) |  |  |  |  |

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| *Numbers and the number system* | *8 lessons* |
| **Key concepts (National Curriculum statements)** | **The Big Picture**: [Number and Place Value progression map](http://kangaroomaths.com/free_resources/planning/KM_MathematicsProgression_NumberPlaceValue.xlsx) |
| * recognise the place value of each digit in a two-digit number (tens, ones)
* read and write numbers to at least 100 in numerals and in words
* use place value and number facts to solve problems
* identify, represent and estimate numbers using different representations, including the number line
 |
| [Return to overview](#Overview) |
| Possible themes | Possible key learning points |
| * Explore the value of numbers
* Explore where numbers live in our number system
* Solve problems comparing the value of numbers
* Represent numbers in different ways
 | * Explain the value of each digit in a two- digit number
* Read numbers to 100 in numerals and words
* Read numbers to 500 in numerals and words
* Write numbers to 100 in numerals and words
* Write numbers to 500 in numerals and words
* Represent and estimate numbers using a number line
* Compare the value of numbers explaining if they are more/ less than or equal to another number or numbers
* Represent numbers different ways using partitioning
 |
| Prerequisites | Mathematical language | Pedagogical notes |
| * Read and write numbers from 1 to 20 in numerals and words
* Identify and represent numbers using objects and pictorial representations including the number line
* Use the language of more than/ less than (fewer), most, least, equal to when comparing the value of numbers
 | Place value Digit One-digit Two-digit Three-digitHundreds, tens, ones (units) Number words to one hundredEstimate Represent Partition Exchange | Pupils need to understand that when counting in our number system we count objects into groups of ten and then groups of one hundred, one thousand etc.. NCETM: [Glossary](https://www.ncetm.org.uk/public/files/17308038/National%2BCurriculum%2BGlossary.pdf)**Common approaches***Numerals to 100 and beyond –* *It would help to use three different consistent colours to represent the notation of the hundreds, tens and units digits so that the pupils understand that they read the left (or red) digit first etc.**When counting objects pupils should be encouraged to count into groups of ten and then to discuss whether they have enough objects to make another group of ten or whether they have some ‘ones/units’ left over.* |
| Reasoning opportunities and probing questions | Suggested activities | Possible misconceptions |
| * Show me a number that has more/ less tens/units than this number. And Another. And Another.
* Convince me that 53 is less than 58
* Kenny says that 67 is greater than 97. Is he correct?
* What is the same and what is different about these two numbers: 16 and 61?
* Always/Sometimes/Never: A number with 7 in the units will always be greater than a number with 5 in the units?

NCETM: [Place Value Reasoning](https://www.ncetm.org.uk/public/files/18416215/1_Progression_Map_Place_Value_Reasoning.pdf)  | KM: Practical counting activities where pupils are encouraged to support with everyday problems (i.e. counting out and labeling the correct number the of milk cartons, the dinner money, the register for each class etc.)KM: Partitioning patterns: Partition numbers systematically using practical apparatus into multiples of ten and units. For example, How many ways can you partition 53 into different multiples of ten? How do you know that you have found all the ways?KM: [Three in a row](http://kangaroomaths.com/free_resources/teaching/number/rl_three_in_a_line.docx)NRICH: [Two-digit Targets](http://nrich.maths.org/6343)NRICH: [Largest Even](http://nrich.maths.org/7431)NRICH: [Number Detective](http://nrich.maths.org/204)NRICH: [A story about absolutely nothing](http://nrich.maths.org/5598)**Learning review**KM: [2M1 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M1_BAM.pdf)NCETM: [NC Assessment Materials (Teaching and Assessing Mastery)](https://www.ncetm.org.uk/resources/46689) | * Some pupils may muddle the ‘teen’ and the ‘ty’ numbers
* Some pupils may read the units digit before the tens or hundreds digits.
* Some pupils may record numbers incorrectly (for example one hundred and twenty-three as 10023)
* Some pupils may not understand the importance of 0 as a place holder and may therefore make errors in recording. (For example one hundred an 5 as 15)
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| *Counting and comparing* |  *8 lessons* |
| **Key concepts (National Curriculum statements)** | **The Big Picture**: [Number and Place Value progression map](http://kangaroomaths.com/free_resources/planning/KM_MathematicsProgression_NumberPlaceValue.xlsx) |
| * compare and order numbers from 0 up to 100; use <, > and = signs
* count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
 |
| [Return to overview](#Overview) |
| Possible themes | Possible key learning points |
| * Solve problems comparing the value of numbers
* Order numbers according to their value
* Investigate number patterns
 | * Order numbers (0 to up to 100) from lowest to greatest value and vice versa
* Use = symbol
* Use < symbol when comparing numbers from 0 up to 100
* Use > symbol when comparing numbers from 0 up to 100
* Count on and back in steps of 2 from 0
* Count on and back in steps of 3 from 0
* Count on and back in steps of 5 from 0
* Count on and back in tens from any number
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| Prerequisites | Mathematical language | Pedagogical notes |
| * Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
* Count in multiples of twos, fives and tens
* Can order numbers to 20 accurately
* Understand how a number line and number grid is organised
 | Greater than / Less than, Greatest / LeastValueOrderStepsMultiple (of) TensDigitsPatternSequenceCount on/ backForward/ backwardPredictRule**Notation:**<, > and = signs  | It is vital that pupils are supported in identifying and exploring number patterns using visual resources such as the number line, number grid or practical apparatus. Also exploring a systematic approach to exploring patterns (for example starting with the lowest / highest number first can help them to see patterns more clearly.)Rather than telling the pupils that a number is a specific multiple, encourage them to spot patterns and to generalize. Questions such as ‘What do you notice?’ or why would/ wouldn’t this number be in this pattern will help the pupils to internalise their understanding.NCETM: [Glossary](https://www.ncetm.org.uk/public/files/17308038/National%2BCurriculum%2BGlossary.pdf)**Common approaches***When using the greater than and less than signs ensure that you teach the pupils to read the number sentence from left to right. It might also be beneficial to add actions to help the pupils to remember what each sign represents.* |
| Reasoning opportunities and probing questions | Suggested activities | Possible misconceptions |
| * Kenny thinks 17 is a multiple of 3. Do you agree with Kenny?
* Jenny thinks that all multiples of 2 are even numbers. Do you agree with Jenny?
* Benny says that the multiples of 3 will make a diagonal pattern on the number grid. Is he correct?
* Show me a number that is < 100. And Another. And Another.
* Show me a number with 3 in the units that is less than 50 but greater than 25. And Another. And Another.
* Convince me that 67 will not be in this sequence: 5,10,15,20 …..
* Lenny starts at 94 and counts back in tens. He thinks that he will land on the number 49. Is he correct?
* Using the following 6 digits, (5,7,8,2,1,9) can you make three two-digit numbers with the greatest/ lowest value? What do you notice?

NCETM: [Place Value Reasoning](https://www.ncetm.org.uk/public/files/18416215/1_Progression_Map_Place_Value_Reasoning.pdf) | KM: Pattern spotting: Use practical apparatus alongside the number line or number grid to explore patterns. Encourage pupils to discuss what they notice and what they expect the pattern to look like if continued. Ask them to consider whether larger numbers would or would not fall in the pattern and explain their reasoning.KM: Dice, dominoes, practical apparatus: Create, build and order numbers according to their value. Support through the use of the number line or number grid. KM: [Equals Sign Base Board](http://kangaroomaths.com/free_resources/teaching/number/rl_equals_sign_base_board.docx)NRICH: [The Thousands Game](http://nrich.maths.org/2646)  NRICH: [Four-digit Targets](http://nrich.maths.org/6342)**Learning review**KM: [2M2 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M2_BAM.pdf)**,** [2M3 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M3_BAM.pdf)**,** [2M4 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M4_BAM.pdf)NCETM: [NC Assessment Materials (Teaching and Assessing Mastery)](https://www.ncetm.org.uk/resources/46689) | * Pupils may think that all numbers ending in 3 are multiples of 3
* Pupils may not spot patterns because they are not secure in the stable order of our number system
* Pupils may not understand that the position of the digits in a number represents the value
* Pupils may misread the greater than > and less than < signs
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| *Investigating properties of shapes* | *12 lessons* |
| **Key concepts (National Curriculum statements)** | **The Big Picture**: [Properties of Shape progression map](http://kangaroomaths.com/free_resources/planning/KM_MathematicsProgression_GeometryPropertiesShape.xlsx) |
| * identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
* identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
* compare and sort common 2-D and 3-D shapes and everyday objects
* identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
 |
| [Return to overview](#Overview) |
| Possible themes | Possible key learning points |
| * Explore 2 –D shapes
* Explore 3 –D shapes
* Compare 2-D and 3-D shapes
 | * Identify and describe the properties of pentagons
* Identify and describe the properties of hexagons
* Identify and describe the properties of octagons
* Identify symmetry properties of 2-D shapes using vertical lines
* Compare and sort 2-D shapes
* Identify and describe 2-D shapes on the surface of 3-D shapes
* Identify and describe the properties of 3-D shapes including the number of edges
* Identify and describe the properties of 3-D shapes including the number of vertices
* Identify and describe the properties of cylinders
* Identify and describe the properties of cones
* Compare and sort 3-D shapes
 |
| Prerequisites | Mathematical language | Pedagogical notes |
| * Recognise and name different 2 –D shapes
* Find everyday examples of 2-D shapes
* Recognise and name different 3 –D shapes
* Find everyday examples of 3-D shapes
 | 2-D shape (polygon)Rectangle, Square, Circle, Triangle and other 2-D shapes QuadrilateralCircular, Triangular, Rectangular3-D shapeCuboid, Cube, Cone, Cylinder, Pyramid, Sphere, PrismSide, Corner, Line symmetry, VerticalMirror line, Reflection, FoldEdge, Vertex, Vertices, FaceRegularIrregular | Note that a square is a rectangle but a rectangle is not necessarily a square.Pupils may also know names of other polygons such as pentagon (5 sides), hexagon (6 sides), heptagon (7 sides), octagon (8 sides), nonagon (9 sides), decagon (10 sides) and dodecagon (12 sides).Most sets of shapes that are available to buy represent shapes often in their regular form. Be careful not to only present shapes in a regular form or in a specific orientation as this could lead to possible misconceptions.Ensure that pupils understand that line symmetry is where you can draw a line of symmetry (mirror line) across a shape or picture and both sides of the line are identical (a mirror image). NCETM: [Glossary](https://www.ncetm.org.uk/public/files/17308038/National%2BCurriculum%2BGlossary.pdf)**Common approaches***Make sure that pupils refer to the properties of 3-D shapes as edges, vertices and faces and 2-D shapes as sides and corners.**Every classroom displays shapes in different orientations.**Every classroom displays regular and irregular hexagons, pentagons, octagons and decagons* |
| Reasoning opportunities and probing questions | Suggested activities | Possible misconceptions |
| * Look at the shapes in front of you…What can you tell me about the shapes?
* Show me a shape with four sides. And Another. And Another.
* Convince me that this is a square is a rectangle.
* Always/Sometimes/Never**:** A shape with 4 straight sides is a square.
* Always/Sometimes/Never**:** A pyramid has one square face
* Kenny says that a circle has one vertical line of symmetry. Is he correct?

NCETM: [Geometry - Properties of Shapes Reasoning](https://www.ncetm.org.uk/public/files/18438967/8_Progression_Map_Geometry_properties_of_shapes_Reasoningv2.pdf) | KM: [Barrier Games](http://kangaroomaths.com/free_resources/teaching/geometry/rl_barrier_games.docx)KM: [Can I come to the party?](http://kangaroomaths.com/free_resources/teaching/geometry/rl_can_i_come_to_the_party.docx)NRICH: [Take a ... Geoboard](http://nrich.maths.org/10674)NRICH: [Properties of Shapes KS1](http://nrich.maths.org/9020)NRICH: [Stringy Quads](http://nrich.maths.org/2913)NRICH: [Let us reflect](http://nrich.maths.org/1873)**Learning review**KM: [2M12 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M12_BAM.pdf)NCETM: [NC Assessment Materials (Teaching and Assessing Mastery)](https://www.ncetm.org.uk/resources/46689) | * Some pupils may think that a rectangle and square are the same shape.
* Some pupils may think that a cuboid and cube are the same solid.
* Some pupils may misuse the language used to describe the properties of shapes (for example using edges rather than sides when describing 2-D shapes)
* Some pupils may only recognise shapes when they are in a specific (often horizontal orientation)
* Some pupils think that all hexagons, pentagons, octagons and decagons are regular
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| *Calculating: addition and subtraction* | *16 lessons* |
| **Key concepts (National Curriculum statements)** | **The Big Picture**: [Calculation progression map](http://kangaroomaths.com/free_resources/planning/KM_MathematicsProgression_NumberCalculation.xlsx) |
| * recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
* add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers
* show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
* recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
* solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods
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| [Return to overview](#Overview) |
| Possible themes | Possible key learning points |  |
| * Explore addition and subtraction facts
* Explore mental strategies to solve calculations
* Use the inverse relationship between addition and subtraction
* Solve problems addition or subtraction
 | * Recall and use addition facts within 20
* Derive addition facts within 100
* Understand why addition is commutative
* Add a two-digit number and ones using concrete objects, pictorial representations, and mentally
* Add a two-digit number and tens using concrete objects, pictorial representations, and mentally
* Add two two-digit numbers using concrete objects, pictorial representations, and mentally
* Add three one-digit numbers using concrete objects, pictorial representations, and mentally
* Recall and use subtraction facts within 20
 | * Derive subtraction facts within 100
* Understand why subtraction is not commutative
* Subtract ones from a two-digit number using concrete objects, pictorial representations, and mentally
* Subtract tens from a two-digit number using concrete objects, pictorial representations, and mentally
* Subtract two two-digit number using concrete objects, pictorial representations, and mentally
* Solve problems involving addition or subtraction using concrete objects and pictorial representations
* Solve missing number problems
* Check calculations using the correct inverse operation
 |
| Prerequisites | Mathematical language | Pedagogical notes |
| * Understand the value of digits in two-digit numbers
* Interpret a mathematical statement involving the symbols + and = or – and =
* Add and subtract one- and two-digit numbers to 20, including 0
 | Add, subtract Count on, count back More, lessPlus, minus, total, sumDifference betweenPartitionBridgeRound, adjustInverseNumber lineNumber factsMultiple of ten, tens boundary | To help develop conceptual understanding concrete apparatus (base-10 equipment, Numicon, etc.) need to be used alongside pictorial representations (an empty number line, partitioning, etc.) Model each of the possible strategies during the unit and create a ‘toolkit’ (bank of examples) that the pupils can refer to.KM: [Progression: Addition and Subtraction](http://www.kangaroomaths.com/free_resources/hod/bouncebuzz_addition_subtraction.pdf) and [Calculation overview](http://kangaroomaths.com/free_resources/teaching/number/calculation_overview_bouncebuzz.pdf)NCETM: [Designing a calculation policy](https://www.ncetm.org.uk/resources/44577), [The Bar Model](https://www.ncetm.org.uk/resources/44567) and [Subtraction](https://www.ncetm.org.uk/resources/40532)NCETM: [Glossary](https://www.ncetm.org.uk/public/files/17308038/National%2BCurriculum%2BGlossary.pdf)NRICH: [Developing Number Fluency - What, Why and How](file:///C%3A%5CUsers%5CKangaroo%20Maths%5CDownloads%5CDeveloping%20number%20fluency-What%2C%20Why%20and%20How)**Common approaches***To avoid confusion with language, all teachers use ‘sum’ to refer to calculations that only involve addition.* *Teachers avoid saying ‘2 take away 7’ is not possible.*  |
| Reasoning opportunities and probing questions | Suggested activities | Possible misconceptions |
| * If I know that 13 + 7 = 20, what else do I know?
* Convince me that 36 + 7 = 43
* Sam says that it doesn’t matter which way round you put the numbers when you subtract. Is he correct?
* Show me a calculation that is equal to 17. And another. And another.
* Show me a subtraction calculation where it is easier to count on (use addition) to find the difference in value.

NCETM: [Addition and Subtraction Reasoning](https://www.ncetm.org.uk/public/files/18416326/2_Progression_Map_Addition_and_Subtraction_Reasoning.pdf) | KM: Pupils are presented with a range of calculations (some correct/ incorrect) and they have to explain which are correct/ incorrect and why? KM: [If I know …](http://kangaroomaths.com/free_resources/teaching/number/rl_if_i_know.docx)KM: [How do you calculate … ?](http://kangaroomaths.com/free_resources/teaching/number/rl_how_do_you_calculate.docx)NRICH: [Sums of Pairs](http://nrich.maths.org/5533), [Sort Them Out](http://nrich.maths.org/6885), [Strike it Out for Two](http://nrich.maths.org/10091)NCETM: [Activity A](https://www.ncetm.org.uk/resources/42529), [Activity C](https://www.ncetm.org.uk/resources/42529), [Activity D](https://www.ncetm.org.uk/resources/42529)**Learning review**KM: [2M5 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M5_BAM.pdf)**,** [2M6 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M6_BAM.pdf)NCETM: [NC Assessment Materials (Teaching and Assessing Mastery)](https://www.ncetm.org.uk/resources/46689) | * Some pupils may include the first number in the count (not count on from)
* Some pupils may confuse the language of addition or subtraction, and therefore use the incorrect operation to carry out a calculation
* Some children may assume commutativity within subtraction and say ‘2 take away 7’ when they should say ‘7 take away 2’.
* Many children may think that 2 take away 7 is not possible. It is possible (when negative numbers are introduced in Stage 4), and care with language now will lessen problems with misconceptions later.
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| *Exploring time* | *8 lessons* |
| **Key concepts (National Curriculum statements)** | **The Big Picture**: [Measurement and mensuration progression map](http://kangaroomaths.com/free_resources/planning/KM_MathematicsProgression_GeometryMeasurementMensuration.xlsx) |
| * know the number of minutes in an hour and the number of hours in a day.
* compare and sequence intervals of time
* tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
 |
| [Return to overview](#Overview) |
| Possible themes | Possible key learning points |
| * Explore the relationship between units of time
* Explore ways of recording time
* Compare and sequence intervals of time
 | * Know that there are 60 minutes in one hour
* Know that there are 24 hours in one day
* Tell the time using quarter past/to the hour on an analogue clock
* Write the time using quarter past/to the hour on an analogue clock
* Tell the time to five minute intervals on an analogue clock
* Write the time to five minute intervals on an analogue clock
* Draw the hands on a clock face to show times to five minutes, including quarter past/to the hour
* Compare and order a selection of times from earliest to latest or vice versa
 |
| Prerequisites | Mathematical language | Pedagogical notes |
| * Read the time to the hour and half past
* Draw the hands on a clock face to show the time to the hour or half past
* Know the meaning of before, after, next, first, today, yesterday, tomorrow, morning, afternoon, evening and o’clock
 | Time Hour, minute, secondDayo’clockHalf pastQuarter to, quarter pastClockHandsAnalogueInterval**Notation**A colon is used to separate hours and minutes when writing the time | Construct/annotate a clock face to show that it actually represents two different scales. The minute scale (and hand) could be represented in one colour and the hour scale (and hand) in a different colour.Provide as many opportunities as possible throughout the day (and year) for pupils to practice reading or setting the time. It is helpful to construct a shared toolkit of key facts related to the relationships between units of time. This could be a class toolkit displayed for all to see or could also be in the form of a maths mat or bookmark constructed by the pupils to help them remember key facts.When comparing or sequencing times pupils should assume that the given times are within the same day. The notation of a.m. and p.m. is not introduced until Stage 3 so they should also assume that the given times are within the same morning or afternoon. NCETM: [Glossary](https://www.ncetm.org.uk/public/files/17308038/National%2BCurriculum%2BGlossary.pdf)**Common approaches***Every classroom has a set of geared mini-clocks and a larger teacher version. The classroom clock has labels for quarter past, half past and quarter to.* |
| Reasoning opportunities and probing questions | Suggested activities | Possible misconceptions |
| * True or false? There are 100 minutes in an hour. There are 12 months in one year. 25 minutes past 6 is same as saying 6:25.
* Benny says that when the minute hand is pointing to the 5 on a clock face, then it is 5 minutes past the hour. Is he correct? Explain why.
* Show me a time where the minute hand is past the hour hand. And another, and another…
* Show me a pair of times with a difference of 15 minutes. And another, and another…

NCETM: [Measurement Reasoning](https://www.ncetm.org.uk/public/files/18436766/7_Progression_Map_Measurement_Reasoning.pdf) | KM: [Build and explore a clock](http://kangaroomaths.com/free_resources/teaching/geometry/rl_build_and_explore_a_clock.docx) NRICH: [What Is the Time?](http://nrich.maths.org/7377)NRICH: [Two Clocks](http://nrich.maths.org/4806)NCETM: [Activity D (Telling the time ITP)](https://www.ncetm.org.uk/resources/42718)**Learning review**KM: [2M10 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M10_BAM.pdf)NCETM: [NC Assessment Materials (Teaching and Assessing Mastery)](https://www.ncetm.org.uk/resources/46689) | * Some pupils may confuse the two different scales on the clock face (the hour scale and the minute scale); e.g. read 10 past 5 as 2 past 10.
* Some pupils may incorrectly record the minutes on the clock face; i.e. not appreciate the fact that when the minutes are past the hour, the minute hand must be carefully positioned in relation to how many minutes past the hour it is and not point to the hour.
* Some pupils may decimalise time and incorrectly use 100 seconds = 1 minute or 100 minutes = 1 hour
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| *Calculating: multiplication and division* | *16 lessons* |
| **Key concepts (National Curriculum statements)** | **The Big Picture**: [Calculation progression map](http://kangaroomaths.com/free_resources/planning/KM_MathematicsProgression_NumberCalculation.xlsx) |
| * recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
* calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
* show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
* solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
 |
| [Return to overview](#Overview) |
| Possible themes | Possible key learning points |  |
| * Develop arithmetic skills
* Develop knowledge of multiplication tables
* Explore properties of numbers
* Explore ways of writing calculations
* Solve problems involving multiplication and division
 | * Recall and use multiplication facts for the 2 times table
* Recall and use multiplication facts for the 5 times table
* Recall and use multiplication facts for the 10 times table, linking multiplying by 10 to place value
* Understand that multiplication is commutative
* Recall and use division facts for the 2 times table
* Recall and use division facts for the 5 times table
* Recall and use division facts for the 10 times table
* Understand that division is not commutative
 | * Create mathematical statements for multiplication
* Create mathematical statements for division
* Recognise odd and even numbers
* Use knowledge of commutativity when multiplying and dividing mentally
* Understand the connection between multiplication and repeated addition
* Identify the correct operation(s) required in order to solve a problem
* Solve missing number problems involving multiplication
* Solve missing number problems involving division
 |
| Prerequisites | Mathematical language | Pedagogical notes |
| * Count from zero in 2s, 5s and 10s
* Use concrete objects to solve problems involving multiplication and division
* Use pictorial representations to solve problems involving multiplication and division
* Use arrays to solve problems involving multiplication and division
 | Calculation, CalculateMultiplication table, Times tableOdd, EvenMultiply, Multiplication, Times, ProductRepeated additionArrayMathematical statementCommutativeDivide, DivisionInverseOperation**Notation:**×, ÷ and = signs | Pupils make the connection between arrays and commutativity of multiplication. It may be helpful to encourage pupils to read ‘5 × 2’ as ‘five multiplied by 2’ and make the connection with the array: xxxxxxxxxxUseful resources: Counters, Hundred squares, Times table squares, Counting stick, Cuisenaire rods, Place value discsKM: [Progression: Multiplication and Division](http://kangaroomaths.com/free_resources/hod/bouncebuzz_multiplication_division_v4.pdf) and [Calculation overview](http://kangaroomaths.com/free_resources/hod/bouncebuzz_calculation_overview_v4.pdf)NCETM: [The Bar Model](https://www.ncetm.org.uk/resources/44568) NCETM: [Multiplication](https://www.ncetm.org.uk/resources/40530), [Division](https://www.ncetm.org.uk/resources/43589), [Multiplicative reasoning](https://www.ncetm.org.uk/resources/43669)NCETM: [Glossary](https://www.ncetm.org.uk/public/files/17308038/National%2BCurriculum%2BGlossary.pdf)**Common approaches***All classrooms display a* [*times table poster with a twist*](http://kangaroomaths.com/free_resources/display/chinese_tables.docx)*Teachers say ‘complete these calculations’ instead of ‘complete these sums’ for calculations involving multiplication and division.**Number tiles, such as Numicon, are used to help pupils visualise odd and even numbers* |
| Reasoning opportunities and probing questions | Suggested activities | Possible misconceptions |
| * Show me an odd (even) number. And another. And other
* Convince me that the product of two even (odd) numbers is even (odd)
* If 2 × 6 = 12 then ….
* Convince me 0 is even

NCETM: [Multiplication and Division Reasoning](https://www.ncetm.org.uk/public/files/18438909/3_Progression_Map_Multiplication_and_Division_Reasoningv2.pdf) | KM: [Stick on the Maths L2ALG1: Odd and even](http://www.kangaroomaths.com/free_resources/teaching/sotm/level2/2alg1_ewb.doc)NRICH: [Multiplication Table – Matching Cards](http://nrich.maths.org/1252)NRICH: [Odd times even](http://nrich.maths.org/8062)NRICH: [Even and Odd](http://nrich.maths.org/6895)NCETM: [Activity C: Triangle of Numbers](http://www.topmarks.co.uk/Flash.aspx?f=triangularcardsv4), [Activity D: How many chairs?](http://www.bbc.co.uk/education/clips/zppfgk7)**Learning review**KM: [2M7 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M7_BAM.pdf)**,** [2M8 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M8_BAM.pdf)NCETM: [NC Assessment Materials (Teaching and Assessing Mastery)](https://www.ncetm.org.uk/resources/46689) | * Some pupils may not see and/or understand the connection between the multiplication statements 2 × 5 and 5 × 2
* Some pupils may the see the times tables as a list of isolated, unconnected statements
* Some pupils may write statements such as 2 ÷ 8 = 4
* Some pupils may think that 30 is odd because ‘3’ is odd
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| *Exploring fractions* | *12 lessons* |
| **Key concepts (National Curriculum statements)** | **The Big Picture**: [Fractions, decimals and percentages progression map](http://kangaroomaths.com/free_resources/planning/KM_MathematicsProgression_NumberFDP.xlsx) |
| * recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity
* write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2
 |
| [Return to overview](#Overview) |
| Possible themes | Possible key learning points |  |
| * Explore fractions

  | * Recognise one quarter as one of four equal parts of an object, shape or quantity and use fraction notation
* Recognise two quarters as two of four equal parts, or two of one quarter, of an object, shape or quantity and use fraction notation
* Recognise a three quarters as three of four equal parts, or three of one quarter of an object, shape or quantity and use fraction notation
* Recognise one third as one of three equal parts of an object, shape or quantity and use fraction notation
* Find one quarter of an object, shape or set of objects
* Find two quarters of an object, shape or set of objects
 | * Find three quarters of an object, shape or set of objects
* Find one third of an object, shape or set of objects
* Recognise that a half is equivalent to two quarters
* Write simple fraction statements involving the fraction 1/2 such as 1/2 of 6 = 3
* Write simple fraction statements involving the fractions 1/4, 2/4 or 3/4, such as 1/4 of 8 = 2
* Write simple fraction statements involving the fractions 1/3 such as 1/3 of 6 = 2
 |
| Prerequisites | Mathematical language | Pedagogical notes |
| * Recognise a half as one of two equal parts of an object, shape or quantity
* Recognise a quarter as one of four equal parts of an object, shape or quantity
 | PartEqualWhole Half, halvesQuarter, three quartersThirdEquivalentFractionNumeratorDenominatorUnit fraction, non-unit fraction**Notation** Horizontal bar for fractionsDiagonal bar for fractions | In these early stages fractions are developed as proportions of an amount. In future, pupils see that fractions can also be numbers in their own right.There is a difference between using a fraction as an adjective to describe a representative amount of an object (for example ‘this is ¼ of this square’) or as a verb where the fraction is used to describe an action (for example ‘I am finding ¼ of 8’). The first involves partitioning and identifying the fraction; the second involves use of multiplication or division facts to find the fractional amount.Children need opportunities to explore practically fractions of lengths / objects and shapes and then to make the links to representation of what they have found. NCETM: [Teaching fractions](https://www.ncetm.org.uk/resources/44490)NCETM: [Glossary](https://www.ncetm.org.uk/public/files/17308038/National%2BCurriculum%2BGlossary.pdf)**Common approaches***Pupils are expected to use horizontal bar notation for fractions* |
| Reasoning opportunities and probing questions | Suggested activities | Possible misconceptions |
| * Show me ½ of an amount. And another, and another …
* True or false:
* ¼ is greater than ½ because it has a 4 at the bottom and that is a bigger number
* You can only find one half of even numbers
* One quarter of 20 is smaller than ½ of 10
* Three quarters of an amount is larger than one half of an amount
* Which is the odd one out and why: 1/2, 1/4, 2/4 ?

NCETM: [Fractions Reasoning](https://www.ncetm.org.uk/public/files/18416412/4_Progression_Map_Fractions_Reasoning_.pdf) | KM: [To quarter or not quarter](http://kangaroomaths.com/free_resources/teaching/number/rl_to_quarter_or_not_to_quarter.docx)KM: [Fraction flag](http://kangaroomaths.com/free_resources/teaching/number/rl_fraction_flag.docx)NRICH: [Early Fraction Development](http://nrich.maths.org/9746)NCETM: [Activity B](https://www.ncetm.org.uk/resources/42634)NCETM: [Activity C](https://www.ncetm.org.uk/resources/42634)NCETM: [Activity D](https://www.ncetm.org.uk/resources/42634)**Learning review**KM: [2M9 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M9_BAM.pdf)NCETM: [NC Assessment Materials (Teaching and Assessing Mastery)](https://www.ncetm.org.uk/resources/46689) | * Some pupils may not understand that when splitting one whole into a fractional amount, each part must be equal
* Some pupils may think that to find ¾ you split into 4 and then each of those parts into 3
* Some pupils may think that a quarter is a larger piece than a third since 4 is greater 3
* Some pupils may not appreciate that when shading a fraction of a shape, the position of the shaded section can vary
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| *Mathematical movement* | *8 lessons* |
| **Key concepts (National Curriculum statements)** | **The Big Picture**: [Position and direction progression map](http://kangaroomaths.com/free_resources/planning/KM_MathematicsProgression_GeometryPositionDirection.xlsx) |
| * use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)
* order and arrange combinations of mathematical objects in patterns and sequences
 |
| [Return to overview](#Overview) |
| Possible themes | Possible key learning points |
| * Investigate mathematical language to describe movement
 | * Use mathematical language to describe position
* Use mathematical language to describe movement along a straight line
* Use mathematical language to describe direction of a turn, including meaning of clockwise and anti-clockwise
* Understand and use the language of right angles to describe the size of turn
* Interpret instructions for following a simple route
* Devise instructions for following a simple route
* Order combinations of mathematical objects in patterns and sequences
* Arrange combinations of mathematical objects in patterns and sequences
 |
| Prerequisites | Mathematical language | Pedagogical notes |
| * Describe position using language such as ‘behind’, ‘next to’, ‘on top of’ and ‘between’
* Describe position, direction and movement, including whole, half, quarter and three-quarter turns
* Connect moving clockwise with movement on a clock face
 | Forwards, BackwardsLeft, RightAngleRight angleTurnQuarter, Half, Three quartersRotationPositionDirectionStraightLineClockwise, anticlockwise | Pupils experience following instructions, devising and stating instructions for other pupils to follow and programming a robot with instructions.This unit is an ideal opportunity to introduce the four points of the compass.Understanding degrees as a way of measuring angles is not introduced until Stage 5.It is thought that the origin of the name ‘right angle’ is the Latin word for ‘upright’; as in perpendicular to the horizontal base in architectural contexts.NCETM: [Glossary](https://www.ncetm.org.uk/public/files/17308038/National%2BCurriculum%2BGlossary.pdf)**Common approaches***All pupils experience the ‘feel’ of a right angle by turning through quarter turns* |
| Reasoning opportunities and probing questions | Suggested activities | Possible misconceptions |
| * Show me a quarter turn. An another, and another …
* Always / Sometimes / Never: you need to know the direction of turn if you are asked to turn through two right angles
* Kenny says, ‘A turn of four right angles is the same as doing nothing at all’. Do you agree with Kenny? Explain why.

NCETM: [Geometry: Position Direction and Movement Reasoning](https://www.ncetm.org.uk/public/files/18436990/9_Progression_Map_Geometry_position_direction_and_movement_Reasoning.pdf) | KM: [Stick on the Maths SSM4: Angle measure](http://www.kangaroomaths.com/free_resources/teaching/sotm/level2/2ssm4_ewb.doc)NRICH: [Turning Man](http://nrich.maths.org/public/viewer.php?obj_id=5560)NRICH: [Walking Round a Triangle](http://nrich.maths.org/8084)NRICH: [Poly Plug Pattern](http://nrich.maths.org/7515)NRICH: [Triple Cubes](http://nrich.maths.org/7128) NRICH: [A City of Towers](http://nrich.maths.org/public/viewer.php?obj_id=183)NRICH: [Caterpillars](http://nrich.maths.org/public/viewer.php?obj_id=5742)NRICH: [Repeating Patterns](http://nrich.maths.org/5944)NCETM: [Activity A](https://www.ncetm.org.uk/resources/42932)NCETM: [Activity B](https://www.ncetm.org.uk/resources/42932)**Learning review**KM: [2M13 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M13_BAM.pdf)NCETM: [NC Assessment Materials (Teaching and Assessing Mastery)](https://www.ncetm.org.uk/resources/46689) | * Some pupils may think that right angles have to look like this:

 * Some pupils may think that right angles have to be created from a horizontal and vertical line
* Some pupils may think that all turns have to be in a clockwise direction
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| *Measuring space* | *16 lessons* |
| **Key concepts (National Curriculum statements)** | **The Big Picture**: [Measurement and mensuration progression map](http://kangaroomaths.com/free_resources/planning/KM_MathematicsProgression_GeometryMeasurementMensuration.xlsx) |
| * choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
* compare and order lengths, mass, volume/capacity and record the results using >, < and =
 |
| [Return to overview](#Overview) |
| Possible themes | Possible key learning points |  |
| * Explore the measurement of distance
* Explore the measurement of mass
* Explore the measurement of capacity
* Measure temperature
 | * Choose appropriate units to measure a given length
* Choose appropriate units to measure a given height
* Choose appropriate units to measure a given mass
* Choose appropriate units to measure a given capacity
* Measure a given distance choosing the appropriate equipment
* Measure a given mass choosing the appropriate equipment
* Measure a given capacity choosing the appropriate equipment
* Measure a given temperature choosing the appropriate equipment
 | * Estimate a given distance
* Estimate a given mass
* Estimate a given capacity
* Compare and order lengths
* Compare and order masses
* Compare and order capacities
* Compare and order temperatures
* Compare and order measurements using >, < and =
 |
| Prerequisites | Mathematical language | Pedagogical notes |
| * Use the language long, short, tall, heavy, light, full, empty, more than, less than, double, half
* Use a ruler, weighing scale and container to measure length, mass and capacity
* Know and use the symbols >, < and =
 | UnitLength, height, distance, width, breadthMass, weightTemperatureCapacity, volumeMetre, centimetreGram, kilogramLitre, millilitreDegrees CelsiusRuler, metre stick, tape measureScale, scalesThermometerContainer, vesselOrder, Compare, greater than, less than**Notation**Abbreviations of units: m, cm, g, kg, l, ml, °CThe symbols >, < and = | Pupils are expected to know the units: * metres and centimetres, and their abbreviation
* kilograms and grams, and their abbreviations
* litres and millilitres, and their abbreviations
* degrees Celsius and its abbreviation

Teacher modeling is essential in this unit as pupils can appear to be grasping the concepts but may actually be measuring inaccurately.Wherever possible ensure that the pupils gain practical experience of using different measurements linked to real-life contexts.NCETM: [Glossary](https://www.ncetm.org.uk/public/files/17308038/National%2BCurriculum%2BGlossary.pdf)**Common approaches***Every classroom has a range of measuring equipment and scales immediately available**Every classroom has a sack of sand (25 kg), a bag of sugar (1 kg), a cheque book (1 cheque is 1 gram), a bottle of water (1 litre, and also 1 kg of water) and a teaspoon (5 ml)* |
| Reasoning opportunities and probing questions | Suggested activities | Possible misconceptions |
| * Show me something that you would measure in cm. And something else, and something else…
* Show me how to use this apparatus / read this scale
* Lenny says ‘Tall containers always have a greater capacity than shorter ones’ Do you agree?
* True or false: ‘I should measure the length of my little finger in m’; ‘I should measure the weight of this parcel in ml’

NCETM: [Measurement Reasoning](https://www.ncetm.org.uk/public/files/18436766/7_Progression_Map_Measurement_Reasoning.pdf) | KM: [Measures In Action](http://kangaroomaths.com/free_resources/teaching/geometry/rl_measures_in_action.docx)KM: [Posting a letter/parcel](http://www.royalmail.com/personal/help-and-support/Tell-me-about-size-and-weight-formats): explore the sizes of letters and parcels allowed by the Post OfficeNRICH: [Order, Order!](http://nrich.maths.org/7340), [Oh! Harry!](http://nrich.maths.org/5979), [Can You Do it Too?](http://nrich.maths.org/8327)   [More and more buckets](http://nrich.maths.org/6850)NCETM: [Activity A](https://www.ncetm.org.uk/resources/42718)**Learning review**KM: [2M11 BAM Task](http://www.kangaroomaths.com/free_resources/assessment/BAM/2M11_BAM.pdf)NCETM: [NC Assessment Materials (Teaching and Assessing Mastery)](https://www.ncetm.org.uk/resources/46689) | * Some pupils may think that you put the end of the ruler (rather than the ‘0’) at the start of a line to measure it.
* Some pupils may think that milli- refers to ‘million’
* Some pupils may think that cm (for example) is the unit for measuring anything
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| *Exploring money* | *8 lessons* |
| **Key concepts (National Curriculum statements)** | **The Big Picture**: [Measurement and mensuration progression map](http://kangaroomaths.com/free_resources/planning/KM_MathematicsProgression_GeometryMeasurementMensuration.xlsx) |
| * recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
* find different combinations of coins that equal the same amounts of money
* solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
 |
| [Return to overview](#Overview) |
| Possible themes | Possible key learning points |
| * Explore money
* Solve problems involving money
 | * Recognise and use the symbols for pounds (£) and pence (p)
* Read and say amounts of money combining the coins 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2
* Count, say and record amounts of money combining the coins 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2
* Find different combinations of coins that equal the same amounts of money
* Solve practically simple problems involving addition of money
* Solve practically simple problems of money, including giving change
 |
| Prerequisites | Mathematical language | Pedagogical notes |
| * Add and subtract one- and two-digit numbers to 20
* Recognise the coins: 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2
* Recognise the notes: £5 and £10
 | MoneyCoinChangeNote**Notation**Pounds (£)Pence (p) | This is the first time that pupils explore solving money problems in the classroom. This unit should be very practical. Pupils are expected to be able to record the solution using £ or p notation. Note: Decimal notation for money is not introduced formally until Stage 4. NCETM: [Glossary](https://www.ncetm.org.uk/public/files/17308038/National%2BCurriculum%2BGlossary.pdf)**Common approaches***All classrooms have a collection of real money**£* ***and*** *p are not yet used together to record an amount of money, for example £3.27 or 327p but not £3.27p* |
| Reasoning opportunities and probing questions | Suggested activities | Possible misconceptions |
| * Kenny thinks that ‘the larger the size of the coin, the greater the value of the coin’. Do you agree with Kenny?
* What is the same and what is different: *2p coin, 5p coin, 10p coin, 20p coin?*
* Always/Sometimes/Never: Coins are circular.

NCETM: [Measurement Reasoning](https://www.ncetm.org.uk/public/files/18436766/7_Progression_Map_Measurement_Reasoning.pdf) | KM: [Stick on the Maths L2CALC3: Solving problems](http://www.kangaroomaths.com/free_resources/teaching/sotm/level2/2calc3_ewb.doc)NRICH: [Five Coins](http://nrich.maths.org/142)NRICH: [Money Bags](http://nrich.maths.org/1116)NCETM: [Activity C](https://www.ncetm.org.uk/resources/42718)**Learning review**NCETM: [NC Assessment Materials (Teaching and Assessing Mastery)](https://www.ncetm.org.uk/resources/46689) | * Some pupils may think that the larger the size of the coin, the greater the value of the coin, for example, a 2p coin is greater in value than a 5p coin.
* Some pupils may think that all coins are circular.
* Some pupils may ignore the units in the first instance and simply add the numerical value of the coins, for example, 10p coin + £1 coin = 11p or £11
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| *Presentation of data* | *12 lessons* |
| **Key concepts (National Curriculum statements)** | **The Big Picture**: [Statistics progression map](http://kangaroomaths.com/free_resources/planning/KM_MathematicsProgression_Statistics.xlsx) |
| * interpret and construct simple pictograms, tally charts, block diagrams and simple tables
* ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
* ask and answer questions about totalling and comparing categorical data
 |
| [Return to overview](#Overview) |
| Possible themes | Possible key learning points |
| * Collect information
* Sort information
* Use pictures to represent information
 | * Interpret a pictogram where the symbol represents a single item
* Interpret a pictogram where the symbol represents a multiple of 2 items
* Interpret a pictogram where the symbol represents a multiple of 5 items
* Construct a pictogram where the symbol represents a single item
* Construct a pictogram where the symbol represents a multiple of 2 items
* Construct a pictogram where the symbol represents a multiple of 5 items
* Interpret and construct a tally chart
* Interpret and construct a block diagram
* Interpret information in a simple table
* Create a table to show information
* Ask and answer simple questions by counting the number of objects in each category
* Ask and answer questions about totalling and comparing categorical data
 |
| Prerequisites | Mathematical language | Pedagogical notes |
| * Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
* Compare the value of numbers
* Order numbers
 | DataPictogramTally, Tally chartBlock diagramTableCategory, Categorical dataTotalCompare**Notation**When tallying, groups of five are created by striking through each group of four | In stage 2, pictograms use a symbol for each individual unit and also many-to-one correspondence such as 2, 5 and 10 units.NCETM: [Glossary](https://www.ncetm.org.uk/public/files/17308038/National%2BCurriculum%2BGlossary.pdf)**Common approaches***Pupils need to remember that tallies are blocks of five – make links that the word ‘TALLY’ has* ***five letters*** *and tallying involves making* ***blocks of five.****Pupils always construct or identify the key for a pictogram before doing anything else.* |
| Reasoning opportunities and probing questions | Suggested activities | Possible misconceptions |
| * Show me a tally. And another. And another.
* Kenny thinks that the correct tally for ‘8’ is IIII III. Do you agree with Kenny? Explain your answer.
* Always/Sometimes/Never**:** A symbol in a pictogram represents one unit.

NCETM: [Statistics Reasoning](https://www.ncetm.org.uk/public/files/18437062/10_Progression_Map_Statistics_Reasoning.pdf) | KM: Make a ‘Human’ Block Diagram by asking pupils to stand on a giant set of axes.KM: [Stick on the Maths](http://www.kangaroomaths.com/free_resources/teaching/sotm/level2/2hd4_ewb.doc) [HD4: Recording results](http://www.kangaroomaths.com/free_resources/teaching/sotm/level2/2hd4_ewb.doc)KM: [Stick on the Maths](http://www.kangaroomaths.com/free_resources/teaching/sotm/level1/1hd2_ewb.doc) [HD2: Representing work](http://www.kangaroomaths.com/free_resources/teaching/sotm/level1/1hd2_ewb.doc)KM: [Stick on the Maths](http://www.kangaroomaths.com/free_resources/teaching/sotm/level2/2hd5_ewb.doc) [HD5: Communicating findings](http://www.kangaroomaths.com/free_resources/teaching/sotm/level2/2hd5_ewb.doc)NRICH: [Sticky Data](http://nrich.maths.org/7687)NRICH: [If the World Were a Village](http://nrich.maths.org/7725)NRICH: [Ladybird Count](http://nrich.maths.org/public/viewer.php?obj_id=2341)NCETM: [Activity E](https://www.ncetm.org.uk/resources/42886)**Learning review**NCETM: [NC Assessment Materials (Teaching and Assessing Mastery)](https://www.ncetm.org.uk/resources/46689) | * Some pupils may cross off each five when tallying, rather than crossing of each four lines with a fifth.
* Some pupils may not group in fives when tallying
* Some pupils may think that a symbol always represents one unit in a pictogram.
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