Maths Long Term Plan

**At Usworth Colliery, we …**

**Go places, do things, meet people and learn new things.**



**Maths Curiculum Intent**

At Usworth Colliery:

* We want to inspire our children to be great mathematicians who are engaged in their learning and passionate about their work.
* Through careful planning that is linked to real life experience and cross-curricular content, we want to build resilient problem solvers who are challenged to try hard, reason using accurate vocabulary, think creatively and flexibly and are able to work collaboratively by communicating their ideas coherently. This could be through using practical resources, pictorial representations or formal written methods and explanations.
* We want our children to be excited and confident about their work and proud to share it with their peers, staff and visitors.

***Teaching and Delivering Mathematics***

In short term, daily planning, teachers will ensure that all lessons have the following structure:

1. **Explore**: children are given a problem, picture, stimulus or equipment to discuss. This gives teachers the opportunity to formatively assess pupils’ understanding and adapt the next stage of the lesson if necessary.
2. **Structure and Model**: The teacher may model themselves or use rapid graspers to model new methods and strategies for certain skills or their thinking for reasoning and problem solving. This will be in a ping-pong style where the teacher allows opportunities for children to work practically, record or discuss before feeding back to the class. Again, formative assessment will be happening throughout this stage to set groupings for independent work and identify those who need further support or challenge.
3. **Intelligent Practise**: Children will work independently or in groups to complete the same task wherever possible. Support and challenge will be highlighted on the IWB screen, so children know where to go next or for support. They may self-select this or be guided by the teacher.
4. **Review/Assess**: Finally, there will be a chance to apply learning from the lesson to a new context or to share findings from the lesson and give the teacher a final chance to assess children. They will identify from this point who needs immediate intervention to be completed before the next lesson to help children with gaps to keep up with the lesson sequence.

Throughout each lesson, there will be opportunities to use CPA recording, to reason and solve problems. Variation is also used, either conceptually or procedurally, to ensure maximum progression and allow deep understanding:

**Procedural variation –** This is a deliberate change in the type of examples used and questions set, to draw attention to certain features.  
**Conceptual variation** – When a concept is presented in different ways, to show what a concept is, in all of its different forms.

**Reception: Long Term Plan**

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|  | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **TERM 1** | **BASELINE** | | | Number & place value *(within 5)* | | | 2D shape | | Addition & subtraction  *(within 5)* | | | 3D shape | |  |  |
| **TERM 2** | Addition & subtraction  *(within 5)* | | | Number & place value *(within 10)* | | | Size, weight & capacity | | | Money | Time | |  | | |
| **TERM 3** | Number & place value *(within 20)* | | | Multiplication & division | | | Position & direction | | |  |  |  |  | | |

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| **Reception Autumn Term Medium Term Planning** | | | | |
| **Concept** | **Counting & recognition within 5** | | | |
| **Early Years** | Recognise some numerals of personal significance  Use some number names and number language spontaneously  Uses some number names accurately in play, rhymes and stories  Recognise, say and identify numerals 1 to 5  Count forwards to 5 from 1  Count backwards from 5 to 1  Count forwards and backwards from a given number, within 5  Say the number that comes after a given number within the number sequence 1 – 5 | Say the number that comes before a given number within the number sequence 1 – 5  Perceptually subitise up to 3 (random arrangement)  Perceptually subitise up to 6 (ordered arrangement)  Match groups with the same number of objects (up to 5)  Represent numbers to 5 using concrete (including fingers), marks on paper or pictures (pictorial/abstract) | Count, up to 5 objects, by saying one number name for each item *(1:1 correspondence and stable-order principle)*  Know that numbers identify how many objects are in a set and that the last number in the count gives the total *(cardinal principle)*  Realise not only objects, but anything can be counted, including steps, claps or jumps and count within 5 *(abstraction principle)*  Count actions or objects, up to 5, which cannot be moved  Count out up to 5 objects from a larger group  Count objects in different ways up to 5 *(order-irrelevance principle)* | Select the correct numeral to represent 1 to 5 objects  Count an irregular arrangement of up to 5 objects  Order numbers to 5 (ascending and descending)  Partition a group of objects, up to 5, in different ways, recognise that the total is still the same  Estimate how many objects they can see and checks by counting them  Recognise and extend number patterns |
| **White Rose Small Steps** | ***Number & place value: Numbers to 5***  One, two, three  Four  Five | | ***Number & place value: Comparing groups***  Comparing quantities of identical objects  Comparing quantities of non-identical objects | |
| **Concept** | **2D Shape** | | | |
| **Early Years** | Use mathematical names for ‘flat’ 2D shapes, and mathematical terms to describe shapes  Select a named shape  Explore characteristic of everyday objects and shapes and use mathematical language to describe them  Sort and classify 2D shapes  Use familiar objects and common shapes to create and recreate patterns and build models | | Recognise and describe a 2-step pattern  Extend a 2-step pattern  Create a 2-step pattern  Recognise and describe a 3-step pattern  Extend a 3-step pattern  Create a 3-step pattern  Understand and recognise symmetry  Create symmetrical patterns | |
| **White Rose Small Steps** | ***Geometry: Shape & space***  Spatial awareness  2D shapes | | | |
| **Concept** | **Addition & Subtraction within 5** | | | |
| **Early Years** | Sort into groups  Use the language of ‘more’ and ‘fewer’, ‘equal to’, ‘same as’ to compare two sets of objects *(identical and non-identical groups)*  Compose numbers up to 5  Decompose numbers up to 5  Use the part, part whole model with numbers to 5  In practical activities and discussion, begin to use the vocabulary involved in adding and subtracting  Find the total number of items in two groups *(combine and subitise, count all (aggregation), use known facts)* | | Say the number that is one more than a given number, within 5  Say the number that is one less than a given number, within 5  Find one more from a group of up to five objects  Find one less from a group of up to five objects  Estimate how many objects and check by counting them  Record, using marks that they can interpret and explain  Begins to identify own mathematical problems based on own interests and fascinations | |
| **White Rose Small Steps** | ***Addition & subtraction: Sorting***  Sorting into groups  ***Addition & subtraction: Change within 5***  One more  One less | | ***White Rose Hub Small Steps: Numbers to 5***  Number bonds to 5 | |
| **Concept** | **3D Shape** | | | |
| **Early Years** | Begin to use mathematical names for ‘solid’ 3D shapes and mathematical terms to describe shapes.  Select a named shape  Use familiar objects and common shapes to create and recreate patterns and build models | | | |
| **White Rose Small Steps** | **Geometry: Shape and space**  Spatial awareness  3D shapes | | **Geometry: Exploring patterns**  Making simple patterns  Exploring more complex patterns | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems  Independently choose to scaffold thinking using concrete and pictorial representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  With support *(classroom discussion, paired or guided work)* find a starting point to break into a problem.  Use trial and trial strategy.  Use ideas gained from a trial to decide what to do next.  With support find possibilities.  With support (adult peer) check work *(e.g. look for other possibilities and errors)* | Describe  Listen to others’ descriptions |

**Reception Autumn Term SCFC (ubitising, Counting, Fact Recall, Calculation)**

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| **Reception Autumn Term SCFC** | | | | | | | |
| **Subitising** | | **Counting** | | **Fact Recall** | | **Calculation** | |
| **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** |
| Perceptually subitise 1, 2 & 3 | Conceptually subitise 2 and 3  *(1 and 1, 1, 1 and 1, 2 and 1/1 and 2)*  Perceptually subitise 1 to 6 (regular arrangement) | Count forwards in 1s, from 1 to 5  Count backwards in 1s, from 5 to 1  Count forwards in 1s, from a different starting number, within 5  Count backwards in 1s, from a different starting number, within 5 | |  | Begin to recall ‘one more’ facts, with numbers 1 to 4  Begin to recall ‘one less’ facts, with numbers 2 to 5  Recall addition doubles for 1 and 2  Recall double 1 and 2  Begin to recall number bonds, up to a total of 5  *(1+1, 1+2/2+1, 3+1/1+3, 3+2/2+3, 4+1/1+4)* |  | Find one more, within a group of up to five objects  Find one less from a group of up to five objects  Using real objects, find the total number of items in two groups, up to a total of 5  *(combine and subitise, count all (aggregation), use known facts)*  Remove real objects from a small group and find how many are left, up to a total of 5  *(take away and subitise, take away and count how many are left, use known facts)* |

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| **Reception Spring Term Planning** | | | | |
| **Concept** | **Counting & recognition within 10** | | | |
| **Early Years** | Recognise, say and identify numerals to 10  Understand zero  Count forwards to 10 from 0  Count backwards from 10 to 0  Count forwards and backwards from a given number, within 10  Say the number that comes after a given number within the number sequence 0 – 10  Say the number that comes before a given number within the number sequence 1 – 10 | Perceptually subitise up to 10 (ordered arrangement)  Conceptually subitise up to 5 (random arrangement)  Match groups with the same number of objects (up to 10)  Represent numbers to 10 using concrete (including fingers), marks on paper or pictures (pictorial/abstract) | Count, up to 10 objects, by saying one number name for each item *(1:1 correspondence and stable-order principle)*  Count actions or objects, up to 10, which cannot be moved *(abstraction principle)*  Count out up to 10 objects from a larger group  Count objects in different ways up to 10 *(order-irrelevance principle)*  Select the correct numeral to represent 0 to 10 objects | Count an irregular arrangement of up to 10 objects  Order numbers to 10 (ascending and descending)  Partition a group of objects, up to 10, in different ways, recognise that the total is still the same  Estimate how many objects they can see and checks by counting them  Recognise and extend number patterns |
| **White Rose Small Steps** | ***Number & place value: Numbers to 10***  Counting to 6, 7 and 8  Counting to 9 and 10  Comparing groups up to 10 | | | |
| **Concept** | **Size, weight & capacity** | | | |
| **Early Years** | Compare the lengths of two of the same type of objects, stating which is longest, which is the shortest  Estimate and order two or three familiar objects by length or height and by comparing directly  Understand places that are near or close  Understand places that are far away  Understand what the terms ‘light’ and ‘heavy’ and ‘weighs the same as’ mean | | Use a pan balance  Compare two objects by their weight  Estimate and order two or three items by weight  Understand full, empty and half full  Predict and measure how many cups full will it take to fill a variety of containers | |
| **White Rose Small Steps** | **Measurement: Measure**  Lengths, height & distance  Weight  Capacity | | | |
| **Concept** | **Addition & subtraction within 10** | | | |
| **Early Years** | Use the language of ‘more’ and ‘fewer’, ‘equal to’, ‘same as’ to compare two sets of objects *(identical and non-identical groups)*  Compose numbers up to 10  Decompose numbers up to 10  Use the part-whole model with numbers to 10  In practical activities and discussion, use the vocabulary involved in adding and subtracting  Find the total number of items in two groups *(combine and subitise, count all (aggregation), use known facts)*  Say the number that is one more than a given number, within 10 | | Say the number that is one less than a given number, within 10  Find one more from a group of up to 10 objects  Find one less from a group of up to 10 objects  Estimate how many objects and check by counting them  Record, using marks that they can interpret and explain  Identify own mathematical problems based on own interests and fascinations | |
| **White Rose Small Steps** | ***Addition & subtraction: Addition to 10***  Combining two groups to find the whole  Numbers bonds to 10 – ten frame  Numbers bonds to 10 – part-whole model  **White Rose Hub Small Steps: Addition & subtraction: Count on and back**  Adding by counting on  Taking away by counting back | | | |
| **Concept** | **Money** | | | |
| **Early Years** | Children use everyday language to talk about money  To understand what money is, what it is for  Use everyday language to talk about money  Understand the different forms of money | | To recognise coins  To order coins by their value  To sort coins by denomination  To use money in play and real-life situations  Solve money problems | |
| **White Rose Small Steps** |  | | | |
| **Concept** | **Time** | | | |
| **Early Years** | Name the days of the week in order  Order and discuss the order of events during the school day  Order and sequence familiar events in their life  Understand ‘new’ and ‘old’  Understand and use the language of time  Estimate and measure ‘how many times I can \_\_\_\_\_?’ in 10 seconds or a minute  Compare two, time durations (quicker, slower)  Compare two, or more, time durations (quickest, slowest etc.)  Read the time on the clock to the hour (o’clock) | | | |
| **White Rose Small Steps** | ***Measurement: Time***  My day | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems  Independently choose to scaffold thinking using concrete and pictorial representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  With support *(classroom discussion, paired or guided work)* find a starting point to break into a problem.  Use trial and trial strategy  Use ideas gained from a trial to decide what to do next  With support find possibilities  With support (adult peer) check work *(e.g. look for other possibilities and errors)* | Describe  Listen to others’ descriptions |

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| **Reception Spring Term SCFC** | | | | | | | |
| **Subitise** | | **Counting** | | **Fact Recall** | | **Calculation** | |
| **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** |
| Perceptually subitise 1 to 6 (regular arrangement) | Conceptually subitise 2 to 5  *(link to bonds)*  Perceptually subitise 1 to 10  (regular arrangement) | Count forwards in 1s, from 1 to 10  Count backwards in 1s, from 10 to 1  Count forwards in 1s, from a different starting number, within 10  Count backwards in 1s, from a different starting number, within 10 | | Recall ‘one more’ facts, with numbers 1 to 4  Recall ‘one less’ facts, with numbers 2 to 5  Recall addition doubles for 1, 2 and 5  Recall double 1, 2 and 5  Recall number bonds, up to a total of 5 | Begin to recall ‘one more’ facts, with numbers 5 to 9  Begin to recall ‘one less’ facts, with numbers 6 to 10  Begin to recall addition doubles for 4 and 3  Begin to derive and recall double 4 and 3  Recall number bonds, up to a total of 5, including zero | Find one more, within a group of up to five objects  Find one less from a group of up to five objects  Using real objects, find the total number of items in two groups, up to a total of 5  *(combine and subitise, count all (aggregation), use known facts)*  Using real objects, find the total number of items in two groups, up to a total of 5  *(combine and subitise, count all (aggregation), use known facts)* | Find one more, within a group of up to 10 objects  Find one less from a group of up to 10 objects  Add zero, within numbers to 10  Using real and mathematical objects, find the total number of items in two groups, up to a total of 10  *(combine and subitise, count all (aggregation), use known facts)*  Subtract zero, within numbers to 10  Remove real and mathematical objects from a small group and find how many are left, up to a total of 10  *(take away and subitise, take away and count how many are left, use known facts)* |

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| **Reception Summer Term Planning** | | |
| **Concept** | **Counting & recognition within 20** | |
| **Early Years** | Recognise, say and identify numerals to 20  Count forwards to 20 from 0  Count backwards from 20 to 0  Count forwards and backwards from a given number, within 20  Say the number that comes after a given number within the number sequence 0 – 20  Say the number that comes before a given number within the number sequence 1 – 20  Perceptually subitise up to 10 (ordered arrangement)  Conceptually subitise up to 5 (random arrangement)  Represent numbers to 10 using concrete (including fingers), marks on paper or pictures (pictorial/abstract) | Count, up to 20 objects, by saying one number name for each item *(1:1 correspondence and stable-order principle)*  Count actions or objects, up to 20, which cannot be moved *(abstraction principle)*  Count out up to 20 objects from a larger group  Count objects in different ways up to 10 *(order-irrelevance principle)*  Select the correct numeral to represent 0 to 20 objects  Count an irregular arrangement of up to 20 objects  Order numbers to 20 (ascending and descending)  Partition a group of objects, up to 20, in different ways, recognise that the total is still the same  Estimate how many objects they can see and checks by counting them  Recognise and extend number patterns |
| **White Rose Small Steps** | **Number & place value: Numbers to 20**  Counting to 20 | |
| **Concept** | **Multiplication & division** | |
| **Early Years** | In practical activities and discussion, begin to use the vocabulary involved in doubling, halving and sharing | |
| **White Rose Small Steps** | ***Multiplication &division: Numerical patterns***  Doubling  Halving and sharing  Odds and evens | |
| **Concept** | **Position & Direction** | |
| **Early Years** | Understand prepositions  Use prepositions and describe their relative position such as ‘behind’ or ‘next to’  Understand the concept of near/far | |
| **White Rose Small Steps** |  | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems  Independently choose to scaffold thinking using concrete and pictorial representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  With support *(classroom discussion, paired or guided work)* find a starting point to break into a problem.  Use trial and trial strategy  Use ideas gained from a trial to decide what to do next  With support find possibilities  With support (adult peer) check work *(e.g. look for other possibilities and errors)* | Describe  Listen to others’ descriptions |

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| **Reception Summer Term SCFC** | | | | | | | |
| **Subitising** | | **Counting** | | **Fact Recall** | | **Calculation** | |
| **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** |
| Perceptually subitise 1 to 10 *(regular arrangement)*  Conceptually subitise 2 to 5 *(link to bonds)* | | Count forwards in 1s, from 0 to 20  Count backwards in 1s, from 20 to 0  Count forwards in 1s, from a different starting number, within 20  Count backwards in 1s, from a different starting number, within 20 | Count forwards, in multiples of two from zero, to 20  Count forwards, in multiples of 10, from zero, to 100 | Recall ‘one more’ facts, within 10, including zero  Recall ‘one less’ facts, within 10, including zero    Recall number bonds, up to a total of 5, including zero    Recall addition doubles for all numbers to 5, up to a total of 10  Recall doubles to 5, up to a total of 10 | | Find one more, within a group of up to 20 objects  Find one less from a group of up to 20 objects  Using real and mathematical objects find the total number of items in two groups, up to a total of 10, including zero  *(combine and subitise, count all (aggregation), use known facts)*  Remove real and mathematical objects from a small group and find how many are left, up to a total of 10, including zero  *(take away and subitise, take away and count how many are left, use known facts, count back)* | |

**Year 1: Long Term Plan**

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|  | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **TERM 1** | Counting, number & place value  *(within 10)* | | | | Addition & subtraction  *(within 10)* | | | | Shape | Counting, number & place value (within 20) | |  | | | |
| **TERM 2** | Addition & subtraction  *(within 20)* | | | | Counting, number & place value  *(within 50)* | | | Length & height | | Weight & Volume | |  |  | | |
| **TERM 3** | Multiplication & division | | | Fractions | | Position & direction | Counting, number & place value *(within 100)* | | Money | Time | |  | |  | |

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| **Year 1 Autumn Term Planning** | | | | | | | |
| **Concept** | **Counting, number & place value within 10** | | | | | | |
| **National Curriculum** | Count to and across 10, forwards and backwards, beginning with 0 or 1, or from any given number  Count, read and write numbers to 10 in numerals  Read and write numbers from 1 to 10 in words  Count in multiples of twos  Given a number, identify one more and one less within 10  Use the language of: equal to, more than, less than (fewer), most, least  Identify and represent numbers within 10 using objects and pictorial representations including the number line | | | | | | |
| **KS1 TAF** | **WTS**  Count in **2s**, 5s, 10s and use this to solve problems | | | | | | |
| **White Rose Small Steps** | Sort objectives  Count objects  Represent objects  Count, read and write forwards from any number 0 to 10  Count, read and write backwards from any number 0 to 10  Count one more  Count one less  One to one correspondence to start to compare groups  Compare groups using language such as equal, more/greater, less/fewer  Introduce < > and = symbols  Compare numbers  Order groups of objects  Order numbers  Ordinal numbers (1st, 2md, 3rd …)  The number line | | | | | | |
| **Nrich** | [Writing Digits](http://nrich.maths.org/public/viewer.php?time=1228319356&obj_id=161) \* P  [Shut the Box](http://nrich.maths.org/6074) \* G  [Biscuit Decorations](http://nrich.maths.org/public/viewer.php?obj_id=154) \* P  Packing G P | [Making Sticks](http://nrich.maths.org/public/viewer.php?obj_id=231) \*\* P I  [Robot Monsters](http://nrich.maths.org/2404) \* I  Dotty Six \* G  All Change \* G I | | How We’d Count \* G I  Tug of War \* G  Count the Crayons \* P  What’s in a Name? \*\* I | | Count the Digits \* I  [Grouping Goodies](http://nrich.maths.org/public/viewer.php?obj_id=232) \*\*\* P  [Buzzy Bee](http://nrich.maths.org/public/viewer.php?obj_id=194) \* P | |
| **Question Bank** | **Spot the mistake:**  5,6,8,9 What is wrong with this sequence of numbers?  **True or False?**  I start at 2 and count in twos. I will say 9 | | | **What comes next?**  10+1 = 11, 11+1= 12, 12+1 = 13  **Do, then explain**  Look at the objects (in a collection). Are there more of one type than another? How can you find out? | | | |
| **Curriculum Links** | When teaching is focused on measurement, children will be recording lengths, heights, mass, amounts of money, capacity and time – all requiring a good understanding of number structure and place value.   * Ages of family members and friends. Teenagers are of interest! * Numerals as labels on buses, car etc., telephone numbers * Page numbers in books and magazines (ordinal) * Games of all kinds, e.g. board games, computer games, football scores * Preparing for parties, planning activities and events, counting supplies * Measuring, money and time | | | | | | |
| **Concept** | **Addition & subtraction within 10** | | | | | | |
| **National Curriculum** | Represent and use number bonds and related subtraction facts within 10  Add and subtract one-digit numbers within 10, including zero  Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs  Solve one-step problems that involve addition and subtraction within 10, using concrete objects and pictorial representations, and missing number problems | | | | | | |
| **KS1 TAF** | **WTS**  Recall 4/6 number bonds for 10 and reason about associated facts  **EXS**  Recall numbers bonds to and within 10 | | | | | | |
| **White Rose Small Steps** | Part-whole model  Addition symbol  Fact families – addition facts  Find number bonds for numbers within 10  Systematic methods for number bonds within 10  Number bonds to 10  Compare number bonds  Addition – adding more  Finding a part  Subtractions – taking away, how many left? Crossing out  Subtraction – taking away, how many left?  Introducing the subtraction symbol  Subtraction – finding a part, breaking apart  Fact families – the 8 facts  Subtraction – counting back  Subtraction – finding the difference  Comparing addition and subtraction statements a + b > c  Comparing addition and subtraction statements a + b > c + d | | | | | | |
| **Nrich** | [Domino Sorting](http://nrich.maths.org/public/viewer.php?obj_id=4940) \* I  [One Big Triangle](http://nrich.maths.org/public/viewer.php?obj_id=192) \* G  [Ladybirds in the Garden](http://nrich.maths.org/public/viewer.php?obj_id=1816) \*\* P  [Number Lines](http://nrich.maths.org/public/viewer.php?obj_id=5652) \* P | | [Pairs of Numbers](http://nrich.maths.org/7233) \* I  [Weighted Numbers](http://nrich.maths.org/public/viewer.php?obj_id=4726) \* G P  Butterfly Flower \*P | | [Two Dice](http://nrich.maths.org/150) \* I  [Find the Difference](http://nrich.maths.org/public/viewer.php?obj_id=6227) \*\* G  [Sort Them Out (1)](http://nrich.maths.org/6885) \* G | | [2,4,6,8](http://nrich.maths.org/public/viewer.php?time=1188566002&obj_id=175) \*\*\* P  [How Do You See it?](http://nrich.maths.org/8296) \* P  [What Could It Be?](https://nrich.maths.org/10479) \* I |
| **Question Bank** | **Continue the pattern**  10 + 8 = 18 11 + 7 = 18  Can you make up a similar pattern for the number 17?  How would this pattern look if it included subtraction?  **Missing numbers**  9 +? = 10, 10 -? = 9  What number goes in the missing box?  **Connected Calculations**  11 = 3 + 8 12 = 4 + 8 13 =? + 8 14 =? + 8  What numbers go in the boxes?  Can you continue this sequence of calculations? | | **Working backwards**  Through practical games on number tracks and lines ask questions such as “where have you landed?” and “what numbers would you need to throw to land on other given numbers?”  **What do you notice?**  11 – 1 = 10, 11 – 10 = 1  Can you make up some other number sentences like this involving 3 different numbers? | | **Fact families**  Which four number sentences link these numbers? 12, 15, 3 What else do you know?  If you know this: 12 – 9 = 3 What other facts do you know?  **Missing symbols**  Write the missing symbols (+ - =) in these number sentences:  17? 3? 20  18? 20? 2 | | **Convince me**  In my head I have two odd numbers with a difference of 2. What could they be? Convince me  **Missing numbers**  Fill in the missing numbers (using a range of practical resources to support)  12 +? = 19 20 -? = 3 |
| **Curriculum Links** | **Multiplication and division**  Multiplication must be understood both as ‘repeated addition’ and as ‘scaling’. Likewise, division is both ‘repeated subtraction’ and reduction (multiply by a scale factor of less than 1). You should model these concepts using manipulatives including bead strings and arrays. For example:  Give each child a bead string with 20 beads on it. Ask them to find 3 multiplied by 4 by moving 3 beads at a time four times giving 12. Next, ask them to divide 12 by 3 by taking away groups of 3. As they do this you could demonstrate what they are doing on a number line. It is important that the children use practical apparatus before using a number line because a number line alone is too abstract for some children.  Give the children 12 counters and ask them to set these out in three rows of four on a piece of paper or a whiteboard: | | Discuss how they can make 12 by adding four three times, and, if they turn their array around they can add three four times. They could record these as addition and multiplication number sentences.  **Fractions**  You could give the children opportunities to find halves and quarters of different quantities, for example 20. They could find half by dividing by two or sharing single a set of 20 objects into two piles. They could then count how many are in each half and then add them together to check that when  they do they get the whole amount. They could do the same for quarters, adding two groups to find two quarters or ½ and three for ¾.  **Measurement**  You could ask the children to measure different lengths in metres using metre sticks or centimetres using rulers. They could then find totals or differences of pairs of lengths. They could repeat this for measuring masses in kilograms and capacities or volumes in litres | | Within the geography curriculum, the children are expected to identify seasonal and daily weather patterns in the United Kingdom and the location of hot and cold areas of the world in relation to the Equator and the North and South Poles. When they do this they could use subtraction to find differences in the temperatures of the different areas.  Within the history curriculum, the children are expected to explore where the people and events they study fit within a chronological framework. This could involve using subtraction or counting on to find time differences between these events. They could use addition to find, for example the number of years the people they studied lived or the lengths of reign of different Kings and Queens.  Within the science curriculum there are opportunities to connect with addition and subtraction, for example, in the programmes of study the children are expected to use their local environment throughout the year to explore and answer questions about animals in their habitat. They need to be able to sort and group them. This would give opportunities for children add and subtract to find totals and differences. | | |

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| **Concept** | **Geometry: shape** | |
| **National Curriculum** | Recognise and name common 2-D and 3-D shapes, including:   * 2-D shapes [e.g. rectangles (including squares), circles and triangles] * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres]. | |
| **KS1 TAF** | **WTS**  Name some common 2D & 3D shapes and describe their properties | |
| **White Rose Small Steps** | Recognise and name 3D shapes  Sort 3D shapes  Recognise and name 2D shapes  Sort 2D shapes  Patterns with 3D and 2D shapes | |
| **Nrich** | [Shaping It](http://nrich.maths.org/7301) \* I  What’s Happening? \* P  Jig Shapes \* P | |
| **Question Bank** | **What’s the same, what’s different?**  Find a rectangle and a triangle in this set of shapes. Tell me one thing that’s the same about them. Tell me one thing that is different about them.  **Visualising**  Put some shapes in a bag.  Find me a shape that has more than three edges. | **True or false?**  All 2-D shapes have at least 4 sides  **Other possibilities**  Can you find shapes that can go with the set with this label? “Have straight sides” |
| **Curriculum Links** | **P.E.** - Making shapes with your own body in gymnastics and dance  **Geography** – looking at shapes within the natural environment, on maps and plans  **Small world play**– different shaped pieces and containers used in sand and water play and shapes cut out in modelling dough.  **Design Technology**– when using construction kits children can be encouraged to describe their work using vocabulary associated with the properties of shapes  Shapes in the environment, shape packaging and those in artwork and pictures. | |

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| **Concept** | **Counting, number & place value within 20** | | | |
| **National Curriculum** | Count to and across 20, forwards and backwards, beginning with 0 or 1, or from any given number  Count, read and write numbers to 20 in numerals  Read and write numbers from 1 to 20 words  Count in multiples of twos and tens  Given a number, identify one more and one less within 20  Use the language of: equal to, more than, less than (fewer), most, least  Identify and represent numbers within 20 using objects and pictorial representations including the number line | | | |
| **KS1 TAF** | **WTS**  Count in **2s**, 5s, **10s** and use this to solve problems | | | |
| **White Rose Small Steps** | Count forwards and backwards and write numbers to 20 in numerals and words  Numbers from 11 to 20  Tens and ones  Count one more and one less  Compare groups of objects  Compare numbers  Order groups of objects  Order numbers | | | |
| **Nrich** | [Writing Digits](http://nrich.maths.org/public/viewer.php?time=1228319356&obj_id=161) \* P  [Shut the Box](http://nrich.maths.org/6074) \* G  [Biscuit Decorations](http://nrich.maths.org/public/viewer.php?obj_id=154) \* P  [Grouping Goodies](http://nrich.maths.org/public/viewer.php?obj_id=232) \*\*\* P | [Buzzy Bee](http://nrich.maths.org/public/viewer.php?obj_id=194) \* P  Packing G P  [Making Sticks](http://nrich.maths.org/public/viewer.php?obj_id=231) \*\* P I  [Robot Monsters](http://nrich.maths.org/2404) \* I | Dotty Six \* G  All Change \* G I  How We’d Count \* G I  Tug of War \* G | What’s in a Name? \*\* I  Count the Digits \* I  Count the Crayons \* P |
| **Question Bank** | **Spot the mistake:**  5,6,8,9 What is wrong with this sequence of numbers?  **True or False?**  I start at 2 and count in twos. I will say 9 | | **What comes next?**  10+1 = 11, 11+1= 12, 12+1 = 13  **Do, then explain**  Look at the objects (in a collection). Are there more of one type than another?  How can you find out? | |
| **Curriculum Links** | When teaching is focused on measurement, children will be recording lengths, heights, mass, amounts of money, capacity and time – all requiring a good understanding of number structure and place value.   * Ages of family members and friends. Teenagers are of interest! * Numerals as labels on buses, car etc., telephone numbers * Page numbers in books and magazines (ordinal) * Games of all kinds, e.g. board games, computer games, football scores * Preparing for parties, planning activities and events, counting supplies * Measuring, money and time | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete and pictorial representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Begin to independently find a starting point to break into a problem  Use trial and improvement strategy  Independently find possibilities  With support *(adult, peer)* check work *(e.g. look for other possibilities, repeats, missing answers and errors)*  Independently pattern spot and copy and continue a pattern *(objects, shapes, numbers, spatial)* predicting what will come next  With support, investigate statements | Describe and explain with reasons  Listen to others’ explanations and try to make sense of them |

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| **Year 1 Autumn Term CFC** | | | | |
| **Counting** | | **Fact Recall** | | **Calculation** |
| **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** |
| Count forwards in 1s, from 0 to 10  Count backwards in 1s, from 10, to 0  Count forwards in 1s, from a different starting number, within 10  Count backwards in 1s, from a different starting number, within 10  Count forwards, in multiples of two, from zero, to 24  Count backwards, in multiples of two, from 24, to zero  **WTS**  ***Count in 2s and use this to solve problems*** | Count forwards in 1s, from 0 to 20  Count backwards in 1s, from 20, to 0  Count forwards in 1s, from a different starting number, within 20  Count backwards in 1s, from a different starting number, within 20  Count forwards, in multiples of two, from zero, to 24  Count backwards, in multiples of two, from 24, to zero  **WTS**  ***Count in 2s and use this to solve problems***  Count forwards, in multiples of 10, from zero, to 120  Count backwards, in multiples of 10, from 120, to zero  **WTS**  ***Count in 10s and use this to solve problems*** | Recall ‘one more’ facts, within 10, including zero  Recall ‘one less’ facts, within 10  Recall number bonds and related subtraction facts within 5, including zero and use the commutative law  **WTS**  ***Recall at least four of the six number bonds for 10 and reason about associated facts***  **EXS**  ***Derive, recall and use systematic number bonds for 10, including zero and the commutative law***  Represent and use number bonds and related subtraction facts within 10, including zero and use the commutative law  Recall addition doubles for all number to 5, up to a total of 10  Recall doubles to 5, up to a total of 10, and the corresponding halves | Recall ‘one more’ facts, within 20, including zero  Recall ‘one less’ facts, within 20  Recall number bonds and related subtraction facts within 5, including zero and use the commutative law  **WTS**  ***Recall at least four of the six number bonds for 10 and reason about associated facts***  **EXS**  ***Derive, recall and use systematic number bonds for 10, including zero and the commutative law***  Represent and use number bonds and related subtraction facts within 10, including zero and use the commutative law  Recall addition doubles for all number to 5, up to a total of 10  Recall doubles to 5, up to a total of 10, and the corresponding halves | Add near addition doubles, up to a total of 10, using doubles to 5 *(partition, double and adjust by 1)*  Add two, 1-digit numbers, within 10, without bridging the ten boundary  *(subitise, reorder and put the larger number first, count on (augmentation), known fact)*  Subtract two, 1-digit numbers, within 10  *(subitise, count back (taking away), count on (finding the difference), known fact)*  Subtract a 1-digit number from ten  *(subitise, count back (taking away), count on (finding the difference), known fact)* |

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| **Year 1 Spring Term Medium Term Planning** | | | | | | | | | | | | |
| **Concept** | **Addition & subtraction within 20** | | | | | | | | | | | |
| **National Curriculum** | Represent and use number bonds and related subtraction facts within **20**  Add and subtract one-digit numbers within **20**, including zero  Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs  Solve one-step problems that involve addition and subtraction within **20**, using concrete objects and pictorial representations, and missing number problems | | | | | | | | | | | |
| **KS1 TAF** | **WTS**  Recall at least four of the six number bonds for 10 and reason about associated facts  **EXS**  Recall numbers bonds to and within 10, use number bonds to and within 10 to reason and calculate bonds to and within 20 | | | | | | | | | | | |
| **White Rose Small Steps** | Add by counting on  Find and make number bonds  Add by making 10  Subtraction – not crossing 10  Subtraction - crossing 10  Related facts  Compare number sentences | | | | | | | | | | | |
| **Nrich** | [Domino Sorting](http://nrich.maths.org/public/viewer.php?obj_id=4940) \* I  [One Big Triangle](http://nrich.maths.org/public/viewer.php?obj_id=192) \* G  [Ladybirds in the Garden](http://nrich.maths.org/public/viewer.php?obj_id=1816) \*\* P  [Number Lines](http://nrich.maths.org/public/viewer.php?obj_id=5652) \* P | | | [Pairs of Numbers](http://nrich.maths.org/7233) \* I  [Weighted Numbers](http://nrich.maths.org/public/viewer.php?obj_id=4726) \* G P  Butterfly Flowers \* P | | | | | [Two Dice](http://nrich.maths.org/150) \* I  [Find the Difference](http://nrich.maths.org/public/viewer.php?obj_id=6227) \*\* G  [Sort Them Out (1)](http://nrich.maths.org/6885) \* G  [2,4,6,8](http://nrich.maths.org/public/viewer.php?time=1188566002&obj_id=175) \*\*\* P | [How Do You See it?](http://nrich.maths.org/8296) \* P  [What Could It Be?](https://nrich.maths.org/10479) \* I | | |
| **Question Bank** | **Continue the pattern**  10 + 8 = 18 11 + 7 = 18  Can you make up a similar pattern for the number 17?  How would this pattern look if it included subtraction?  **Missing numbers**  9 +? = 10, 10 -? = 9  What number goes in the missing box? | | **Connected Calculations**  11 = 3 + 8 12 = 4 + 8 13 =? + 8 14 =? + 8  What numbers go in the boxes?  Can you continue this sequence of calculations?  **Working backwards**  Through practical games on number tracks and lines ask questions such as “where have you landed?” and “what numbers would you need to throw to land on other given numbers?” | | | | | **What do you notice?**  11 – 1 = 10, 11 – 10 = 1  Can you make up some other number sentences like this involving 3 different numbers?  **Fact families**  Which four number sentences link these numbers? 12, 15, 3 What else do you know?  If you know this: 12 – 9 = 3 What other facts do you know? | | | **Convince me**  In my head I have two odd numbers with a difference of 2. What could they be? Convince me  **Missing numbers**  Fill in the missing numbers (using a range of practical resources to support)  12 +? = 19 20 -? = 3  **Missing symbols**  Write the missing symbols (+ - =) in these number sentences:  17? 3? 20 and 18? 20? 2 | |
| **Curriculum Links** | **Multiplication and division**  Multiplication must be understood both as ‘repeated addition’ and as ‘scaling’. Likewise, division is both ‘repeated subtraction’ and reduction (multiply by a scale factor of less than 1). You should model these concepts using manipulatives including bead strings and arrays. For example:  Give each child a bead string with 20 beads on it. Ask them to find 3 multiplied by 4 by moving 3 beads at a time four times giving 12. Next, ask them to divide 12 by 3 by taking away groups of 3. As they do this you could demonstrate what they are doing on a number line. It is important that the children use practical apparatus before using a number line because a number line alone is too abstract for some children.  Give the children 12 counters and ask them to set these out in three rows of four on a piece of paper or a whiteboard: | | | Discuss how they can make 12 by adding four three times, and, if they turn their array around they can add three four times. They could record these as addition and multiplication number sentences.  **Fractions**  You could give the children opportunities to find halves and quarters of different quantities, for example 20. They could find half by dividing by two or sharing single a set of 20 objects into two piles. They could then count how many are in each half and then add them together to check that when  they do they get the whole amount. They could do the same for quarters, adding two groups to find two quarters or ½ and three for ¾. | | | | | **Measurement**  You could ask the children to measure different lengths in metres using metre sticks or centimetres using rulers. They could then find totals or differences of pairs of lengths. They could repeat this for measuring masses in kilograms and capacities or volumes in litres.  Within the science curriculum there are opportunities to connect with addition and subtraction, for example, in the programmes of study the children are expected to use their local environment throughout the year to explore and answer questions about animals in their habitat. They need to be able to sort and group them. This would give opportunities for children add and subtract to find totals and differences  Within the geography curriculum, the children are expected to identify seasonal and daily weather patterns in the United Kingdom and the location of hot and cold areas of the world in relation to the Equator and the North and South Poles. When they do this they could use subtraction to find differences in the temperatures of the different areas. | | | Within the history curriculum, the children are expected to explore where the people and events they study fit within a chronological framework. This could involve using subtraction or counting on to find time differences between these events. They could use addition to find, for example the number of years the people they studied lived or the lengths of reign of different Kings and Queens. |
| **Concept** | **Counting, number & place value within 50** | | | | | | | | | | | |
| **National Curriculum** | Count to and across **50**, forwards and backwards, beginning with 0 or 1, or from any given number  Count, read and write numbers to **50** in numerals  Read and write numbers from 1 to **50** words  Count in multiples of twos, fives and tens  Given a number, identify one more and one less within **50**  Use the language of: equal to, more than, less than (fewer), most, least  Identify and represent numbers within **50** using objects and pictorial representations including the number line | | | | | | | | | | | |
| **KS1 TAF** | **WTS**  Count in 2s, 5s, 10s and use this to solve problems | | | | | | | | | | | |
| **White Rose Small Steps** | Numbers to 50  Tens and ones  Represent numbers to 50  One more one less  Compare objects within 50  Compare numbers within 50  Order numbers within 50  Count in 2s  Count in 5s | | | | | | | | | | | |
| **Nrich** | [Writing Digits](http://nrich.maths.org/public/viewer.php?time=1228319356&obj_id=161) \* P  [Shut the Box](http://nrich.maths.org/6074) \* G  [Biscuit Decorations](http://nrich.maths.org/public/viewer.php?obj_id=154) \* P  [Grouping Goodies](http://nrich.maths.org/public/viewer.php?obj_id=232) \*\*\* P | Packing G P  [Making Sticks](http://nrich.maths.org/public/viewer.php?obj_id=231) \*\* P I  [Robot Monsters](http://nrich.maths.org/2404) \* I  Dotty Six \* G | | | All Change \* G I  How We’d Count \* G I  Tug of War \* G  [Buzzy Bee](http://nrich.maths.org/public/viewer.php?obj_id=194) \* P | | | | | Count the Crayons \* P  What’s in a Name? \*\* I  Count the Digits \* I | | |
| **Question Bank** | **Spot the mistake:**  5,6,8,9 What is wrong with this sequence of numbers?  **True or False?**  I start at 2 and count in twos. I will say 9 | | | | **What comes next?**  10+1 = 11, 11+1= 12, 12+1 = 13  **Do, then explain**  Look at the objects (in a collection). Are there more of one type than another?  How can you find out? | | | | | | | |
| **Curriculum Links** | When teaching is focused on measurement, children will be recording lengths, heights, mass, amounts of money, capacity and time – all requiring a good understanding of number structure and place value.   * Ages of family members and friends. Teenagers are of interest! * Numerals as labels on buses, car etc., telephone numbers * Page numbers in books and magazines (ordinal) * Games of all kinds, e.g. board games, computer games, football scores * Preparing for parties, planning activities and events, counting supplies * Measuring, money and time | | | | | | | | | | | |
| **Concept** | **Length & height** | | | | | | | | | | | |
| **National Curriculum** | Compare, describe and solve practical problems for:   * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * Measure and begin to record **lengths and heights** | | | | | | | | | | | |
| **KS1 TAF** | **EXS**  Read scales in divisions of 1s, 2s, 5s & 10s | | | | | | | | | | | |
| **White Rose Small Steps** | Compare lengths and heights  Measure length | | | | | | | | | | | |
| **Nrich** | [Wallpaper](http://nrich.maths.org/public/viewer.php?obj_id=4964) \*\* P  [Sizing Them Up](http://nrich.maths.org/public/viewer.php?obj_id=4962) \* G  [The Animals’ Sports Day](http://nrich.maths.org/7789) \* I  [Different Sizes](http://nrich.maths.org/8117) \* P I  [Bottles (1)](https://nrich.maths.org/10337) \* P | | | | | Bottles (2) \* P  [The Games’ Medals](http://nrich.maths.org/7763) \*\* I  [How Tall?](http://nrich.maths.org/7536) \* I  Can You Do it Too? \*\* G | | | | | | |
| **Question Bank** | **Top tips**  How do you know that this (object) is longer / taller than this one? Explain how you know. | | | | | **Application**  Which two pieces of string are the same length as this book? | | | | | | |
| **Curriculum Links** | Addition and Subtraction You could ask the children to measure different lengths in metres using metre sticks or centimetres using rulers. They could then find totals of or differences between pairs of lengths. Fractions You could give the children opportunities to measure half a metre and to find the equivalence in the smaller unit of centimetres  Within the science curriculum there are opportunities to connect with measurement, for example, the children are expected to use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. | | | | | | They can also connect measurement with the four seasons by observing and describing how day length varies.  Within the history curriculum, the children are expected to explore where the people and events they study fit within a chronological framework. This could involve plotting the years of different events on a number line.  Within the design and technology curriculum there are opportunities to connect with measurement when the children carry out practical activities that might require accurate measuring of lengths. | | | | | |
| **Concept** | **Weight & volume** | | | | | | | | | | | |
| **National Curriculum** | Compare, describe and solve practical problems for:   * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter]   Measure and begin to record **mass/weight and capacity and volume** | | | | | | | | | | | |
| **KS1 TAF** | **EXS**  Read scales in divisions of 1s, 2s, 5s & 10s | | | | | | | | | | | |
| **White Rose Small Steps** | Introduce weight and mass  Measure mass  Compare mass  Introduce capacity and volume  Measure capacity  Compare capacity | | | | | | | | | | | |
| **Nrich** | [Wallpaper](http://nrich.maths.org/public/viewer.php?obj_id=4964) \*\* P  [Sizing Them Up](http://nrich.maths.org/public/viewer.php?obj_id=4962) \* G  [The Animals’ Sports Day](http://nrich.maths.org/7789) \* I  [Different Sizes](http://nrich.maths.org/8117) \* P I  [Bottles (1)](https://nrich.maths.org/10337) \* P | | | | | Bottles (2) \* P  [The Games’ Medals](http://nrich.maths.org/7763) \*\* I  [How Tall?](http://nrich.maths.org/7536) \* I  Can You Do it Too? \*\* G | | | | | | |
| **Question Bank** |  | | | | | | | | | | | |
| **Curriculum Links** | Addition and Subtraction You could ask the children to measure different masses in kilograms or capacities or volumes in litres They could then find totals of or differences. Fractions You could give the children opportunities to measure half a kilogram/litre and to find the equivalence in the smaller unit of grams/millilitres. | | | | | | Within the science curriculum there are opportunities to connect with measurement, for example, the children are expected to use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. They can also connect measurement with the four seasons by observing and describing how day length varies.  Within the history curriculum, the children are expected to explore where the people and events they study fit within a chronological framework. This could involve plotting the years of different events on a number line.  Within the design and technology curriculum there are opportunities to connect with measurement when the children carry out practical activities that might require accurate measuring of lengths. | | | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete and pictorial representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Begin to independently find a starting point to break into a problem  Use trial and improvement strategy  Independently find possibilities  With support *(adult, peer)* check work *(e.g. look for other possibilities, repeats, missing answers and errors)*  Independently pattern spot and copy and continue a pattern *(objects, shapes, numbers, spatial)* predicting what will come next  With support, investigate statements | Describe and explain with reasons  Listen to others’ explanations and try to make sense of them |

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| **Year 1 Spring Term CFC** | | |
| **Counting** | **Fact Recall** | **Calculation** |
| Count forwards in 1s, from 0 to 50  Count backwards in 1s, from 50 to 0  Count forwards in 1s, from a different starting number, within 50  Count backwards in 1s, from a different starting number, within 50  Count forwards, in multiples of two, from zero and any other multiple, up to 50  Count backwards, in multiples of two, from 50 and any other multiple, to zero  **WTS**  ***Count in 2s and use this to solve problems***  Count forwards, in multiples of 10, from zero or any other multiple, to 120  Count backwards, in multiples of 10, from 120, or any other multiple, to zero  **WTS**  ***Count in 10s and use this to solve problems***  Count forwards, in multiples of five, from zero, or any other multiple, up to 60  Count backwards, in multiples of five, from 60 or any other multiple, to zero  **WTS**  ***Count in 5s and use this to solve problems*** | Recall ‘one more’ facts, within 50, including zero  Recall ‘one less’ facts, within 50  ***WTS***  ***Recall at least four of the six number bonds for 10 and reason about associated facts***  **EXS**  ***Recall and use systematic number bonds for 10 and 20, including zero and the commutative law***  Represent, use and recall addition and subtraction facts, for all numbers within 10, including zero, and those for 10 and use the commutative law  Derive, recall and use systematic number bonds for 20, including zero and the commutative law  Derive and recall addition doubles for numbers 6 to 10, up to a total of 20  Derive and recall doubles for numbers 6 to 10, up to a total of 20, and the corresponding halves | Add near addition doubles, up to a total of 20, using doubles to 10 *(partition, double and adjust by 1)*  Add three, one-digit numbers, without bridging the ten boundary  *(subitise, reorder and put the larger number first, count on (augmentation), partition to bridge the ten, known fact)*  Add two, one-digit numbers, bridging the ten boundary, within 20  Add a one-digit number and 10, making a teens number, within 20  Add a one-digit number to a two-digit number (teens numbers), within 20  *(subitise, reorder putting the larger number first, counting on (augmentation), partition and combine ones and ten, known fact)*  Subtract ten from a two-digit number (teens number)  Subtract a one-digit number from a two-digit number (teens numbers), within 20, without bridging the ten boundary  *(subitise, count back (taking away), count on (finding the difference), known fact)*  Subtract a one-digit number from a two-digit number (teens numbers), within 20, bridging the ten boundary  *(subitise, count back (taking away), count on (finding the difference), known fact)* |

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| **Year 1 Summer Term Medium Term Planning** | | | | |
| **Concept** | **Multiplication & division** | | | |
| **National Curriculum** | Count in multiples of twos, fives and tens  Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher | | | |
| **KS1 TAF** | **WTS**  Count in 2s, 5, 10s and use this to solve problems | | | |
| **White Rose Small Steps** | Count in 10s  Make equal groups  Add equal groups  Make arrays  Make doubles  Make equal groups – grouping  Make equal groups - sharing | | | |
| **Nrich** | [Lots of Biscuits!](http://nrich.maths.org/6883) \* P  [Share Bears](http://nrich.maths.org/public/viewer.php?obj_id=2358) \* G | | | |
| **Question Bank** |  | | | |
| **Curriculum Links** | **Money** - when shopping and recognising prices of items, ordering items by price, finding quantities in multiple purchases, sales prices, sharing costs.  **Measurement** - calculating area and perimeter, finding journey distances, reading and calculating scales, adjusting recipe quantities.  **Data** - interpreting and evaluating data, calculating amounts from pie charts and pictograms. | | | |
| **Concept** | **Fractions** | | | |
| **National Curriculum** | Recognise, find and name a half as one of two equal parts of an object, shape or quantity  Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity | | | |
| **KS1 TAF** | **EXS**  Identify **¼**, 1/3, **½**, 2/4, ¾ of a number or shape and know all parts must be equal | | | |
| **White Rose Small Steps** | Halving shapes or objects  Halving a quantity  Find a quarter of a shape or object  Find a quarter of a quantity | | | |
| **Nrich** | [Halving](http://nrich.maths.org/public/viewer.php?obj_id=1788) \*\* I  [Happy Halving](http://nrich.maths.org/217) \*\*\* P | | | |
| **Question Bank** | **What do you notice?**  Choose a number of counters. Place them onto 2 plates so that there is the same number on each half.  When can you do this and when can’t you?  What do you notice? | | **True or false?**  Sharing 8 apples between 4 children means each child has 1 apple. | |
| **Curriculum Links** | Number and place value  Addition and subtraction Multiplication and divisionMeasurement Fractions, halves and quarters, can be linked to many different ‘real-life’ contexts. Children naturally use the term ‘half’ or ‘halve’ in general conversation. Encourage them, and the adults working with them, to refine their use of the word, and try to use it accurately. | | | |
| **Concept** | **Geometry: position & direction** | | | |
| **National Curriculum** | Describe position, direction and movement, including half, quarter and three-quarter turns. | | | |
| **KS1 TAF** |  | | | |
| **White Rose Small Steps** | Describe turns  Describe positions | | | |
| **Nrich** | [Tangram Tangle](http://nrich.maths.org/2398) \*\*\* G  [Olympic Rings](http://nrich.maths.org/7551) \*\* I  [2 Rings](http://nrich.maths.org/public/viewer.php?obj_id=5330) \* I | | | |
| **Question Bank** | **Working backwards**  The shape below was turned three quarter of a full turn and ended up looking like this.  What did it look like when it started? (practical) | | | |
| **Curriculum Links** | Work within geometry relating to position Aspects of position, direction and movement can be integrated with work in other areas of the curriculum.  PE and dance lessons prove easy contexts in which to apply and consolidate skills. Games can include instructions relating to position and direction, e.g. labelling the corners of a room the ‘N, S, E and W’  Action songs, rhymes and games such as ‘Simon Says…’ can be adapted to include directional instructions  Many popular children’s stories can provide engaging contexts for this mathematical work. *‘We’re Going on a Bear Hunt’*(Rosen, M.& Oxenbury, H.,1997, Walker Books) is a good example where the vocabulary of position, direction and movement can be used in context. *‘Rosie’s Walk’* (Hutchins, P, 1998, Bodley Head) and *‘Katie Morag Delivers the Mail’*(Hedderiwck, M, 2-1-, Red Fox): both provide superb contexts in which to teach an understanding of directional maps and models  Small world play resources, using play mats and figures, can provide excellent settings for creating real life scenarios (traffic following set routes, animals being delivered to a zoo, stacking classroom shop shelves with supplies etc.) to physically demonstrate and practise key skills.  and direction can be linked to other areas of the mathematics curriculum. For example, when using clock faces and hoops relating to position, key elements can be reinforced. | | | |
| **Concept** | **Counting, number & place value within 100** | | | |
| **National Curriculum** | Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number  Count, read and write numbers to 100 in numerals  Read and write numbers from 1 to 100 in words  Count in multiples of twos, fives and tens  Given a number, identify one more and one less within 100  Use the language of: equal to, more than, less than (fewer), most, least  Identify and represent numbers within 100 using objects and pictorial representations including the number line | | | |
| **KS1 TAF** | **WTS**  Read and write numerals up to 100, partition two-digit numbers  Recognise the place value of each digit in a two-digit number (tens, ones) | | | |
| **White Rose Small Steps** | Count to 100  Partition numbers  Compare numbers  Order numbers  One more and one less | | | |
| **Nrich** | [Writing Digits](http://nrich.maths.org/public/viewer.php?time=1228319356&obj_id=161) \* P  [Shut the Box](http://nrich.maths.org/6074) \* G  [Biscuit Decorations](http://nrich.maths.org/public/viewer.php?obj_id=154) \* P  [Grouping Goodies](http://nrich.maths.org/public/viewer.php?obj_id=232) \*\*\* P  [Buzzy Bee](http://nrich.maths.org/public/viewer.php?obj_id=194) \* P | Packing G P  [Making Sticks](http://nrich.maths.org/public/viewer.php?obj_id=231) \*\* P I  [Robot Monsters](http://nrich.maths.org/2404) \* I  Dotty Six \* G | All Change \* G I  How We’d Count \* G I  Tug of War \* G | Count the Digits \* I  Count the Crayons \* P  What’s in a Name? \*\* I |
| **Question Bank** | **Spot the mistake:**  5,6,8,9 What is wrong with this sequence of numbers?  **True or False?**  I start at 2 and count in twos. I will say 9 | | **What comes next?**  10+1 = 11, 11+1= 12, 12+1 = 13  **Do, then explain**  Look at the objects (in a collection). Are there more of one type than another?  How can you find out? | |
| **Curriculum Links** | When teaching is focused on measurement, children will be recording lengths, heights, mass, amounts of money, capacity and time – all requiring a good understanding of number structure and place value.   * Ages of family members and friends. Teenagers are of interest! * Numerals as labels on buses, car etc., telephone numbers * Page numbers in books and magazines (ordinal) | | * Games of all kinds, e.g. board games, computer games, football scores * Preparing for parties, planning activities and events, counting supplies * Measuring, money and time | |
| **Concept** | **Money** | | | |
| **National Curriculum** | Recognise and know the value of different denominations of **coins and notes** | | | |
| **KS1 TAF** | **WTS**  Know the value of different coins | | | |
| **White Rose Small Steps** | Recognising coins  Recognising notes  Counting in coins | | | |
| **Nrich** |  | | | |
| **Question Bank** | **Possibilities**  Ella has two silver coins.  How much money might she have? | | | |
| **Curriculum Links** | Addition and Subtraction When working on measurement and/or addition and subtraction, there are opportunities to make connections between them, for example:  The children could use coins to find totals and differences of small amounts of money, for example one 10 pence and two 2 pence coins. | | | |
| **Concept** | **Time** | | | |
| **National Curriculum** | Compare, describe and solve practical problems for:   * time [e.g. quicker, slower, earlier, later]   Sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]  Measure and begin to record **time** (hours, minutes, seconds)  Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.  Recognise and use language relating to dates, including days of the week, weeks, months and years | | | |
| **KS1 TAF** | **EXS**  Read scales in divisions of 1s, 2s, 5s & 10s | | | |
| **White Rose Small Steps** | Before and after  Fates  Time to the hour  Time to the half our  Writing time  Comparing time | | | |
| **Nrich** | [The Animals’ Sports Day](http://nrich.maths.org/7789) \* I  [The Games’ Medals](http://nrich.maths.org/7763) \*\* I  Times of Day \* P I | | | |
| **Question Bank** | **Explain thinking**  Ask pupils to reason and make statements about to the order of daily routines in school e.g. daily timetable e.g. we go to PE after we go to lunch. Is this true or false? What do we do before break time? etc. | | | |
| **Curriculum Links** | Fractions You could give the children clocks and ask them to find different half past times. You could ask problems such as, ‘I got to school at half past seven, Bertie arrived an hour later. Show me what time he got to school.’  Within the science curriculum there are opportunities to connect with measurement, for example, the children are expected to use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. They can also connect measurement with the four seasons by observing and describing how day length varies.  Within the history curriculum, the children are expected to explore where the people and events they study fit within a chronological framework. This could involve plotting the years of different events on a number line. | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations (concrete, pictorial, abstract)  Independently choose to scaffold thinking using concrete and pictorial representations, if required.  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Use trial and improvement strategy.  Independently find possibilities.  With support (adult, peer) check work (e.g. look for other possibilities, repeats, missing answers and errors).  Independently pattern spot and copy and continue a pattern (objects, shapes, numbers, spatial) predicting what will come next.  With support, investigate statements. | Describe and explain with reasons.  Listen to others’ explanations and try to make sense of them. |

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| **Year 1 Summer Term CFC** | | | | | |
| **Counting** | | **Fact Recall** | | **Calculation** | |
| **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** |
| Count forwards and backwards, in multiples of two, from zero and any other multiple  **WTS**  ***Count in 2s and use this to solve problems***  Count forwards and backwards, in multiples of five, from zero or any other multiple  **WTS**  ***Count in 5s and use this to solve problems***  Count forwards and backwards, in multiples of 10, from zero or any other multiple  **WTS**  ***Count in 10s and use this to solve problems*** | Count forwards in 1s, from 0 to 100  Count backwards in 1s, from 100 to 0  Count forwards in 1s, from a different starting number, within 100  Count backwards in 1s, from a different starting number, within 100  Count forwards and backwards, in multiples of two, from zero and any other multiple  **WTS**  ***Count in 2s and use this to solve problems***  Count forwards and backwards, in multiples of five, from zero or any other multiple  **WTS**  ***Count in 5s and use this to solve problems***  Count forwards and backwards, in multiples of 10, from zero or any other multiple  **WTS**  ***Count in 10s and use this to solve problems*** | Represent and use addition and subtraction facts, for all numbers within 20, including zero, and those for 10 and 20 and the commutative law  ***WTS***  ***Recall at least four of the six number bonds for 10 and reason about associated facts***  **EXS**  ***Recall and use systematic number bonds for 10 and 20, including zero and the commutative law***  Recall addition doubles to 10, up to a total to 20  Recall doubles to 10, up to a total to 20, and the corresponding halves | Recall ‘one more’ facts, within 100, including zero  Recall ‘one less’ facts, within 100  ***WTS***  ***Recall at least four of the six number bonds for 10 and reason about associated facts***  **EXS**  ***Recall and use systematic number bonds for 10 and 20, including zero and the commutative law***  Represent and use addition and subtraction facts, for all numbers within 20, including zero, and those for 10 and 20 and the commutative law  Recall addition doubles to 10, up to a total to 20  Recall doubles to 10, up to a total to 20, and the corresponding halves | Add near addition doubles, up to a total of 20, using doubles to 10 *(partition, double and adjust by 1)*  Add three, one-digit numbers, without bridging the ten boundary  *(subitise, reorder and put the larger number first, count on (augmentation), partition to bridge the ten, known fact)*  Add two, one-digit numbers, bridging the ten boundary, within 20  Add a one-digit number and 10, making a teens number, within 20  Add a one-digit number to a two-digit number (teens numbers), within 20  *(subitise, reorder putting the larger number first, counting on (augmentation), partition and combine ones and ten, known fact)*  Subtract ten from a two-digit number (teens number)  Subtract a one-digit number from a two-digit number (teens numbers), within 20, without bridging the ten boundary  *(subitise, count back (taking away), count on (finding the difference), known fact)*  Subtract a one-digit number from a two-digit number (teens numbers), within 20, bridging the ten boundary  *(subitise, count back (taking away), count on (finding the difference), known fact)* | |

**Year 2: Long Term Plan**

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|  | **1** | **2** | **3** | **4** | **5** | **6** | | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **TERM 1** | Counting, number & place value  *WTS: Read and write numerals up to 100, partition two-digit numbers*  *EXS: Partition two-digit numbers into different combinations* | | | Addition & subtraction  *WTS: Reacll4/6 number bonds for 10 and reason about associated facts, +/- two-digit and ones no regrouping, +/- two-digit and tens no regrouping*  *EXS: Recall numbers bonds to and within 10, use number bonds to and within 10 to reason and calculate bonds to and within 20, +/- two, two-digits using an efficient strategy, explain method*  *GDS: Use reasoning about numbers and relations to solve more complex problems and explain thinking, solve unfamiliar word problems involving more than one step* | | | | | Position & direction | Money  *WTS: Know the value of different coins*  *EXS: Use different coins to make the same amount* | | Multiplication & division  *WTS: Count in 2s, 5, 10s and use this to solve problems*  *EXS: Use x/÷facts for 2, 5 & 10 to solve simple problems*  *GDS: Recall and use x/÷ facts for 2, 5 & 10 to make deductions outside known facts, solve unfamiliar word problems involving more than one step* | | Properties of shapes  *WTS: Name some common 2D & 3D shapes and describe their properties*  *EXS: Name and describe properties of 2D&3D shapes*  *GDS: Describe similarities and differences of 2D&3D shapes* | | |
| **TERM 2** | Multiplication & division  *WTS: Count in 2s, 5, 10s and use this to solve problems*  *EXS: Use x/÷facts for 2, 5 & 10 to solve simple problems*  *GDS: r*  *Recall and use x/÷ facts for 2, 5 & 10 to make deductions outside known facts, solve unfamiliar word problems involving more than one step* | | Statistics  *EXS: Read scales in divisions of 1s, 2s, 5s & 10s*  *GDS: Read scales were not all numbers are given & estimate points in between* | | Fractions  *EXS: Identify ¼, 1/3, ½, 2/4, ¾ of a number or shape and know all parts must be equal* | | | | Length & height  *EXS: Read scales in divisions of 1s, 2s, 5s & 10s*  *GDS: Read scales were not all numbers are given & estimate points in between* | Mass, capacity & temperature  *EXS: Read scales in divisions of 1s, 2s, 5s & 10s*  *GDS: Read scales were not all numbers are given & estimate points in between* | | Time  *EXS: Read time to nearest 15mins*  *GDS: Read time to nearest 5mins* | | **Test Administration Window**  **May** | | |
| **TERM 3** | Problem solving & efficient strategies  *WTS: +/- two-digit and ones no regrouping, +/- two-digit and tens no regrouping, count in 2s, 5, 10s and use this to solve problems*  *EXS: +/- two, two-digits using an efficient strategy, explain method, use x/÷facts for 2, 5 & 10 to solve simple problems*  *GDS: Use reasoning about numbers and relations to solve more complex problems and explain thinking, solve unfamiliar word problems involving more than one step, solve unfamiliar word problems involving more than one step* | | | | | | **KS1 Moderation Week June**  Investigations | | | | | | | |  | |

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| **Year 2 Autumn Term Medium Term Planning** | | | | | |
| **Concept** | **Counting, number & place value within 100** | | | | |
| **National Curriculum** | Count in steps of 2, 3, and 5 from 0, and in tens from any number, forwards and backwards  Compare and order numbers from 0 up to 100; use <, > and = signs  Identify, represent and estimate numbers using different representations, including the number line  Read and write numbers to at least 100 in numerals and in words  Recognise the place value of each digit in a two-digit number (tens, ones)  Use place value and number facts to solve problems | | | | |
| **KS1 TAF** | **WTS**  Read and write numerals up to 100, partition two-digit numbers  Recognise the place value of each digit in a two-digit number (tens, ones)  **EXS**  Partition two-digit numbers into different combinations  Use place value and number facts to solve problems | | | | |
| **White Rose Small Steps** | Count objects to 100 and read and write numbers in numerals and words  Represent numbers to 100  Tens and ones with a part whole model  Tens and ones using addition  Use a place value chart  Compare objects  Compare numbers  Order objects and numbers  Count in 2s, 5s and 10s  Count in 3s | | | | |
| **Nrich** | [Buzzy Bee](http://nrich.maths.org/public/viewer.php?obj_id=194) \* P  [Sort Them Out (1)](http://nrich.maths.org/6885) \* G  [Domino Sequences](http://nrich.maths.org/public/viewer.php?obj_id=241) \* P  [Domino Number Patterns](http://nrich.maths.org/public/viewer.php?obj_id=225) \*\* P | [Next Domino](http://nrich.maths.org/public/viewer.php?obj_id=168) \* P  [100 Square Jigsaw](http://nrich.maths.org/public/viewer.php?obj_id=5572) \* G  [That Number Square!](http://nrich.maths.org/8169) \* P I  [How We’d Count](http://nrich.maths.org/8123) \* G I | | [Tug of War](http://nrich.maths.org/public/viewer.php?obj_id=5897) \* G  [Count the Crayons](https://nrich.maths.org/10653) \* P  [Snail One Hundred](http://nrich.maths.org/8303) \* G  [I Like …](http://nrich.maths.org/6962) \* G | [Light the Lights](http://nrich.maths.org/7044) \*\*\* G  [Largest Even](http://nrich.maths.org/7431) \* G P  [Round the Two Dice](https://nrich.maths.org/10435) \* P I |
| **Question Bank** | **Spot the mistake**:  45,40,35,25 What is wrong with this sequence of numbers?  **True or False?**  I start at 3 and count in threes. I will say 13?  **What comes next?**  41+5=46, 46+5=51, 51+5=56, ……  **True or false?**  Explain The largest three-digit number that can be made from the digits 2, 4 and 6 is 264. Is this true or false? Explain your thinking. | | | **Do, then explain**  37 13 73 33 3  If you wrote these numbers in order starting with the smallest, which number would be third?  Explain how you ordered the numbers.  **Do, then explain**  Show the value of the digit 2 in these numbers?  32 27 92 Explain how you know.  **Make up an example**  Create numbers where the ones digit is one less than the tens digit. What is the largest/smallest number? | |
| **Curriculum Links** | Addition and subtraction, multiplication and division, measurement  Within the science curriculum there are opportunities to connect with number and place value, for example, in the notes and guidance it suggests that the children might work scientifically by sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. The results from their findings can be compared and ordered. | | | Within the geography curriculum, the children are expected to identify seasonal and daily weather patterns in the United Kingdom and the location of hot and cold areas of the world in relation to the Equator and the North and South Poles. When they do this, they could order the different temperatures and compare using the greater and less than symbols.  Within the history curriculum, the children are expected to explore where the people and events they study fit within a chronological framework. This could involve ordering the dates of events and the coronations of different Kings and Queens and placing these on a class number line. | |
| **Concept** | **Addition & subtraction** | | | | |
| **National Curriculum** | 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   Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change | | | | |
| **KS1 TAF** | **WTS**  Reacll4/6 number bonds for 10 and reason about associated facts  **EXS**  Recall numbers bonds to and within 10, use number bonds to and within 10 to reason and calculate bonds to and within 20  **WTS**  +/- two-digit and ones no regrouping, +/- two-digit and tens no regrouping  **EXS**  +/- two, two-digits using an efficient strategy, explain method  **GDS**  Use reasoning about numbers and relations to solve more complex problems and explain thinking, solve unfamiliar word problems involving more than one step | | | | |
| **White Rose Small Steps** | Fact families – addition and subtraction bonds to 20  Check calculations  Compare number sentences  Related facts  Bonds to 100 (tens)  Add and subtract 1s  10 more and 10 less  Add and subtract 10s  Add a 2-digit and 1-digit number – crossing ten  Subtract a 1-digit number from a 2-digit number – crossing ten  Add two 2-digit numbers – not crossing ten – add ones and add tens  Add two 2-digit numbers – crossing ten – add ones and add tens  Subtract a 2-digit number from a 2-digit number – not crossing ten  Subtract a 2-diit number from a 2-digit number – crossing ten – subtract ones and tens  Bonds to 100 (tens and ones)  Add three 1-digit numbers | | | | |
| **Nrich** | [Number Round Up](http://nrich.maths.org/188) \*\*\* G P  [4 Dom](http://nrich.maths.org/public/viewer.php?obj_id=179) \*\*\* G P  [Strike it Out](http://nrich.maths.org/6589) \* G  [Cuisenaire Environment](http://nrich.maths.org/public/viewer.php?obj_id=4348) \* G  [Jumping Squares](http://nrich.maths.org/7471) \*\* G  [Number Balance](http://nrich.maths.org/public/viewer.php?obj_id=4725) \*\* I | [Unit Differences](https://nrich.maths.org/10480) \* P I  [The Add and Take-away Path](http://nrich.maths.org/7281) \* I  [Secret Number](http://nrich.maths.org/public/viewer.php?obj_id=5651) \*\* G  [How Many?](http://nrich.maths.org/6927) \* G P  [What Was in the Box?](http://nrich.maths.org/7819) \* G P | | [Doing and Undoing](http://nrich.maths.org/8292) \* I  [Getting the Balance](http://nrich.maths.org/public/viewer.php?obj_id=5676) \*\*\* I  [Noah](http://nrich.maths.org/public/viewer.php?obj_id=136) \*\* P  [Eggs in Baskets](http://nrich.maths.org/public/viewer.php?obj_id=2002) \*\* P  [The Brown Family](http://nrich.maths.org/public/viewer.php?obj_id=2003) \*\*\* G P | [Birthday Cakes](http://nrich.maths.org/public/viewer.php?obj_id=246) \*\* P  [Sitting Round the Party Tables](http://nrich.maths.org/7228) \* P I  [Cuisenaire Counting](http://nrich.maths.org/2724) \*\*\* G P  [Two Spinners](https://nrich.maths.org/10391) \* I |
| **Question Bank** | **Continue the pattern**  90 = 100 – 10, 80 = 100 – 20  Can you make up a similar pattern starting with the numbers 74, 26 and 100?  **Missing numbers**  91 + ? = 100  100 - ? = 89  What number goes in the missing box?  **Connected Calculations**  Put the numbers 19, 15 and 4 in the boxes to make the number sentences correct.  ? = ? - ?  ? = ? + ? | **True or false?**  Are these number sentences true or false?73 + 40 = 113  98 – 18 = 70 46 + 77 = 123 92 – 67 = 35 Give your reasons.  **Hard and easy questions**  Which questions are easy / hard?  23 + 10 = 93 + 10 = 54 + 9 = 54 + 1 =  Explain why you think the hard questions are hard?  **Other possibilities**  ? + ? + ? = 14  What single digit numbers could go in the boxes? How many different ways can you do this? | | **Fact families**  Which four number sentences link these numbers?  100, 67, 33  **What else do you know?**  If you know this: 87 = 100 – 13 what other facts do you know?  **Missing symbols**  Write the missing symbols (+ - =) in these number sentences:  80 ? 20 ? 100  100 ? 70 ? 30  87 ? 13 ? 100 | **Making an estimate**  Which of these number sentences have the answer that is between 50 and 60?  74 - 13 55 + 17 87 – 34  **Always, sometimes, never**  Is it always, sometimes or never true that if you add three numbers less than 10 the answer will be an odd number  **Convince me**  What digits could go in the boxes?  7 ? - 2? = 46  Try to find all of the possible answers.  How do you know you have them all? Convince me |
| **Curriculum Links** | Number and place value, measurement  Within the science curriculum there are opportunities to connect with addition and subtraction, for example, in the notes and guidance it suggests that the children might work scientifically by sorting and classifying things according to various criteria, and recording their findings using charts. This could include finding totals and differences using the strategies for addition and subtraction that they have covered in class.  Within the geography curriculum, the children are expected to identify seasonal and daily weather patterns in the United Kingdom and the location of hot and cold areas of the world in relation to the Equator and the North and South Poles. When they do this, they could the numerical differences in the seasonal average temperatures. | | | Within the history curriculum, the children are expected to explore events beyond living memory that are significant nationally or globally. When they do this, they could plot relevant dates on a number line and compare how long they went on for by counting on or back along it. They also need to explore the lives of significant individuals in the past who have contributed to national and international achievements. The children could plot the years in which they were born and died on a number line and work out, by counting on or back, for how many years they lived. They could then compare the ages of different people and work out how much older one person was than another. | |
| **Concept** | **Geometry: position & direction** | | | | |
| **National Curriculum** | 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 | | | | |
| **KS1 TAF** |  | | | | |
| **White Rose Small Steps** | Describe movement  Describe turns  Describe movement and turns  Make patterns with shapes | | | | |
| **Nrich** | [Turning Man](http://nrich.maths.org/public/viewer.php?obj_id=5560) \* I  [Walking Round a Triangle](http://nrich.maths.org/8084) \* P | | | | |
| **Question Bank** | **Working backwards**  If I face forwards and turn three quarter turns clockwise then a quarter turn anti-clockwise describe my finishing position. | | | | |
| **Curriculum Links** | **Geometry: properties of shape**  You could give the children a selection of 3D-shapes, discuss their properties in terms of numbers of faces, sides and vertices and shapes of faces and then ask them to make patterns using their shapes according to their own criteria, for example alternating shapes with rectangular faces and shapes with circular faces. They could show their pattern for other children to guess the rule. You could repeat this idea for pictures of 2D-shapes, discussing properties including symmetry first.  Within the science curriculum there are opportunities to connect with geometry: position and direction, for example, one of the requirements states that ‘pupils should be taught to: identify and name a variety of plants and animals in their habitats, including micro-habitats. When studying animals, including those in micro-habitats, the children could compare the way different animals move. They could record these in tables or on charts, for example, finding out animals that fly, swim, crawl or run. They could observe how they do this. #Do they travel in straight lines, move in a circular motion or dart about in different directions | | | Within the geography curriculum, the children are expected to use simple compass directions (North, South, East and West) and locational and directional language (e.g. near and far; left and right) to describe the location of features and routes on a map. Give children the opportunity to identify places on maps and to work out in which direction they need to travel to get from one place to another.  In real life we all make turns and move in different directions in everything we do without thinking about it. You could ask the children to consider turns and moves they make while listening to you. You could ask them to make a diagram of moves they make around the classroom, for example, from the classroom door to where they sit and then to the carpet area. You could also ask them to describe turns they make using the vocabulary of clockwise, anti-clockwise, right and left. You could ask them to think about their journeys to school or to a favourite place. Did they notice the directions from home to their chosen place? Probably not! Ask them to notice and make a record of this next time they make the journey. You could ask them to think about the turns and positions they make when doing simple tasks like turning a door handle or brushing their teeth. | |
| **Concept** | **Money** | | | | |
| **National Curriculum** | 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 | | | | |
| **KS1 TAF** | **WTS**  Know the value of different coins  **EXS**  Use different coins to make the same amount | | | | |
| **White Rose Small Steps** | Count money – pence  Count money – pounds (notes and coins)  Count money – notes and coins  Select money  Make the same amount  Compare money  Find the total  Find the difference  Find change  Two-step problems | | | | |
| **Nrich** |  | | | | |
| **Question Bank** | **Possibilities**  How many, different ways can you make 63p using only 20p, 10p and 1p coins? | | | | |
| **Curriculum Links** | Number and place value  We use money to buy the things we need. Using money involves using different mathematics skills like counting, adding, and subtracting amounts of money. | | Take cross-curricular opportunities to deepen children’s understanding of units of measurement. For example, ask them to:   * find out what measures their parents use in their jobs or in the home; | | |
| **Concept** | **Multiplication & division** | | | | |
| **National Curriculum** | Count in steps of 2, 3, and 5 from 0, and in tens from any number, forwards and backwards  Recall and use multiplication and division facts for the 2, 5 and 10 times-tables, including recognizing odd and even numbers  Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot  calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs  Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts | | | | |
| **KS1 TAF** | **WTS**  Count in 2s, 5, 10s and use this to solve problems  Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers  **EXS**  Use x/÷facts for 2, 5 & 10 to solve simple problems  **GDS**  Recall and use x/÷ facts for 2, 5 & 10 to make deductions outside known facts  Solve unfamiliar word problems involving more than one step | | | | |
| **White Rose Small Steps** | Recognising equal groups  Make equal groups  Add equal groups  Multiplication sentences using the x symbol  Multiplication sentences from pictures  Use arrays  2 times-table  5 times-table  10 times-table | | | | |
| **Nrich** | [Odd Times Even](http://nrich.maths.org/8062) \*\*\* I  [Two Numbers Under the Microscope](http://nrich.maths.org/8059) \*\* I  [Even and Odd](http://nrich.maths.org/6895) \* I  [Ring a Ring of Numbers](http://nrich.maths.org/public/viewer.php?obj_id=2782) \* G  [More Numbers in the Ring](http://nrich.maths.org/2783) \*\*\* G P | [How Odd](http://nrich.maths.org/7190) \*\* I  [Doing and Undoing](http://nrich.maths.org/8292) \* I  [Clapping Times](http://nrich.maths.org/public/viewer.php?obj_id=5482) \* G I  [Ordering Cards](http://nrich.maths.org/8058) \* G  [Which Symbol?](http://nrich.maths.org/6777) \* P | | [I’m Eight](http://nrich.maths.org/55) \* I  [Our Numbers](http://nrich.maths.org/7006) \* G  [Are You Well Balanced?](http://nrich.maths.org/public/viewer.php?obj_id=4734) \*\*\* G I  [Magic Plant](http://nrich.maths.org/public/viewer.php?obj_id=145) \*\* P  [The Amazing Splitting Plant](http://nrich.maths.org/public/viewer.php?obj_id=159) \*\*\* P | [The Tomato and the Bean](http://nrich.maths.org/public/viewer.php?obj_id=1079) \*\*\* P  [Lots of Lollies](http://nrich.maths.org/public/viewer.php?obj_id=2360) \*\*\* P I  [Ip Dip](http://nrich.maths.org/7185) \* I |
| **Question Bank** | **Missing numbers**  10 = 5 x ?  What number could be written in the box?  **Making links**  I have 30p in my pocket in 5p coins. How many coins do I have?  **True or false?**  When you count up in tens starting at 5 there will always be 5 units. | | | **Making links**  Write the multiplication number sentences to describe this array   |  |  |  | | --- | --- | --- | | X | X | X | | X | X | X |   What do you notice? Write the division sentences.  **Prove It**  Which four number sentences link these numbers? 3, 5, 15? Prove it. | |
| **Curriculum Links** | Money – shopping: finding quantities in multiple purchases, sales prices, sharing costs.  Measurement - calculating area and perimeter, finding journey distances, reading and calculating scales, adjusting recipe quantities.  Data – interpreting and evaluating data, calculating amounts from pie charts and pictograms. | | | | |
| **Concept** | **Properties of shape** | | | | |
| **National Curriculum** | Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line  Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces  Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]  Compare and sort common 2-D and 3-D shapes and everyday objects | | | | |
| **KS1 TAF** | **WTS**  Name some common 2D & 3D shapes and describe their properties  **EXS**  Name and describe properties of 2D&3D shapes  **GDS**  Describe similarities and differences of 2D&3D shapes | | | | |
| **White Rose Small Steps** | Recognise 2D and 3D shapes  Count sides on 2D shapes  Count vertices on 2D shapes  Draw 2D shapes  Lines of symmetry  Sort 2D shapes  Make patterns with 2D shapes  Count faces on 3D shapes  Count edges on 3D shapes  Count vertices on 3D shapes  Sort 3D shapes  Make patterns with 3D shapes | | | | |
| **Nrich** | [Shapely Lines](http://nrich.maths.org/7009) \* I  [Chain of Changes](http://nrich.maths.org/public/viewer.php?obj_id=221) \*\* P  [Colouring Triangles](http://nrich.maths.org/public/viewer.php?obj_id=171) \*\* P I  [Exploded Squares](http://nrich.maths.org/7008) \* P  [Complete the Square](http://nrich.maths.org/public/viewer.php?obj_id=2910) \*\*\* G | [Let’s Investigate Triangles](http://nrich.maths.org/public/viewer.php?obj_id=93) \* P  [Poly Plug Rectangles](http://nrich.maths.org/7511) \* G I  [Square It](http://nrich.maths.org/2526) \* G  [Inside Triangles](http://nrich.maths.org/5648) \*\*\* G P | | [Building with Solid Shapes](http://nrich.maths.org/public/viewer.php?obj_id=239) \* I  [Skeleton Shapes](http://nrich.maths.org/public/viewer.php?obj_id=1156) \*\* P I  [Rolling That Cube](http://nrich.maths.org/7299) \* I  [Cubes](http://nrich.maths.org/42) \* I  [Shadow Play](http://nrich.maths.org/public/viewer.php?obj_id=2350) \*\*\* P | [Matching Triangles](http://nrich.maths.org/public/viewer.php?obj_id=5638) \* G  [Data Shapes](http://nrich.maths.org/7523) \* P |
| **Question Bank** | **What’s the same, what’s different?** Pick up and look at these 3-D shapes.  Do they all have straight edges and flat faces? What is the same and what is different about these shapes?  **Visualising**  In your head picture a rectangle that is twice as long as it is wide. What could its measurements be? | | | **Always, sometimes, never**  Is it always, sometimes or never true that when you fold a square in half you get a rectangle?  **Other possibilities**  Can you find shapes that can go with the set with this label?  “Have straight sides and all sides are the same length” | |
| **Curriculum Links** | Geometry (position and direction)  Children need to be encouraged to use the language associated with shape in order to describe the physical world and their environment. Understanding how things fit together (or when and why they do not) is important for making connections.  For example, building anything involves a lot of critical consideration about shape in three dimensions, as well as angles. Reading maps and simple plans also involves an understanding of the relationship between 2-D and 3-D shape. | | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Independently find a starting point to break into a problem  With support work systematically  Independently find possibilities  Independently check work *(e.g. look for other possibilities, repeats, missing answers and errors)*  Pattern spot and predict what will come next in a pattern/sequence (numbers, shapes, spatial | Explain with reasons and beginning to use given sentence stems and connectives to expand  Listen to others’ explanations, make sense of them and compare and evaluate  Begin to edit and improve their own and a peer’s explanation  With support, investigate statements and conjectures  Investigate ‘what if?’ questions |

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| **Year 2 Autumn Term CFC** | | | | | |
| **Counting** | | **Fact Recall** | | **Calculation** | |
| **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** |
| Count forwards and backwards in 1s, from 0/100 or any other number, within 100 and beyond 100, crossing the 100 boundary | ***WTS***  ***Count forwards and backwards, in multiples of 2, from zero, or any other multiple, up to 12x2***  ***WTS***  ***Count forwards and backwards, in multiples of 10, from zero, or any other multiple, up to 12x10***  ***WTS***  ***Count forwards and backwards, in multiples of 5, from zero, or any other multiple, up to 12x5*** | Recall ‘10 more’ facts, within 100  Recall ‘10 less’ facts, within 100  Derive and recall what must be added to any two-digit number to make the next multiple of 10, within 100 *(56+? = 60)*  Derive and recall adding a one-digit number and a multiple of 10, within 100  Add multiples of 10, using knowledge of bonds up to 10, within 100 *(20+50, using knowledge of 2+5)*  Subtract multiples of 10, within 100, using knowledge of bonds up to 10, within 100 *(70-30, using knowledge of 7-3)*  Derive and recall addition doubles to 20, up to a total of 40  Derive and recall addition doubles for multiples of 10, up to a total of 100  ***WTS***  ***Recall 4/6 number bonds for 10 and reason about associated facts***  ***EXS***  ***Represent, use and recall addition and subtraction facts, for all numbers within 20, including zero, and those for 10 and 20 and the commutative law*** | Derive and recall doubles to 20, up to a total of 40, and the corresponding halves  Derive and recall doubles, for multiples of 10, up to a total of 100  Double any multiple of 5, up to a total of 50  Halve any multiple of 10, up to 100  Halve any even number, up to 40  ***EXS***  ***Recall multiples of 10, up to 12x10, in any order, including missing numbers and related division facts***  ***GDS***  ***Make deductions outside known facts*** | Derive complements (bonds) to 100, using knowledge of bonds for 10 and bonds for 100 *(23+77=100, using knowledge of 20+70 (2+7) and 3+7)*  Add three, one-digit numbers, including bridging the ten boundary  ***WTS***  ***Add a one-digit number to any two-digit number, without bridging the ten boundary, within 100***  Add a one-digit number to any two-digit number, bridging the ten boundary, within 100  ***WTS***  ***Add a multiple of 10 and a two-digit number, within 100***  Add 9 to any two-digit number, within 100 *(adding ten and subtracting 1 to adjust)*  Add 11 to any two-digit number, within 100 *(adding ten and 1)*  Add 19, 29 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and subtracting 1 to adjust)*  Add 21, 31 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and 1)*  Add two, two-digit numbers, without bridging the ten boundary, within 100  ***EXS***  ***Add two, two-digit numbers, bridging the ten boundary, within 100***  ***EXS***  ***Add two, two-digit numbers, bridging the ten boundary and the 100 boundary***  Add near addition doubles up to a total of 40, using doubles to 20 *(partition, double and adjust by 1)*  Subtract a one-digit number from a multiple of 10, within 100  **WTS**  ***Subtract a one-digit number from a two-digit number, without bridging the ten boundary, within 100***  Subtract a one-digit number from a two-digit number, bridging the ten boundary, within 100  ***WTS***  ***Subtract a multiple of ten from any two-digit number, within 100***  Subtract 9 from any two-digit number, within 100 *(subtract ten and add 1 to adjust)*  Subtract 11 from any two-digit number, within 100 *(subtract ten and 1)*  Subtract 19, 29 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and subtracting 1 to adjust)*  Subtract 21, 31 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and 1)*  Subtract two, two-digit numbers, without bridging the ten boundary, within 100  ***EXS***  ***Subtract two, two-digit numbers, bridging the ten boundary, within 100*** | |

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| **Year 2 Spring Term Medium Term Planning** | | | | | |
| **Concept** | **Multiplication & division** | | | | |
| **National Curriculum** | Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward  Recall and use multiplication and division facts for the 2, 5- and 10-times tables, including recognizing odd and even numbers  Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot  Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs  Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts | | | | |
| **KS1 TAF** | **WTS**  Count in 2s, 5, 10s and use this to solve problems  Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers  **EXS**  Use x/÷facts for 2, 5 & 10 to solve simple problems  **GDS**  Recall and use x/÷ facts for 2, 5 & 10 to make deductions outside known facts  **GDS**  Solve unfamiliar word problems involving more than one step | | | | |
| **White Rose Small Steps** | Make equal groups – sharing  Make equal groups – grouping  Divide by 2  Odd and even numbers  Divide by 5  Divide by 10 | | | | |
| **Nrich** | [Odd Times Even](http://nrich.maths.org/8062) \*\*\* I  [Two Numbers Under the Microscope](http://nrich.maths.org/8059) \*\* I  [Even and Odd](http://nrich.maths.org/6895) \* I  [Ring a Ring of Numbers](http://nrich.maths.org/public/viewer.php?obj_id=2782) \* G  [More Numbers in the Ring](http://nrich.maths.org/2783) \*\*\* G P | | [How Odd](http://nrich.maths.org/7190) \*\* I  [Doing and Undoing](http://nrich.maths.org/8292) \* I  [Clapping Times](http://nrich.maths.org/public/viewer.php?obj_id=5482) \* G I  [Ordering Cards](http://nrich.maths.org/8058) \* G  [Which Symbol?](http://nrich.maths.org/6777) \* P | [I’m Eight](http://nrich.maths.org/55) \* I  [Our Numbers](http://nrich.maths.org/7006) \* G  [Are You Well Balanced?](http://nrich.maths.org/public/viewer.php?obj_id=4734) \*\*\* G I  [Magic Plant](http://nrich.maths.org/public/viewer.php?obj_id=145) \*\* P  [The Amazing Splitting Plant](http://nrich.maths.org/public/viewer.php?obj_id=159) \*\*\* P | [The Tomato and the Bean](http://nrich.maths.org/public/viewer.php?obj_id=1079) \*\*\* P  [Lots of Lollies](http://nrich.maths.org/public/viewer.php?obj_id=2360) \*\*\* P I  [Ip Dip](http://nrich.maths.org/7185) \* I |
| **Question Bank** | **Missing numbers**  10 = 5 x ?  What number could be written in the box?  **Making links**  I have 30p in my pocket in 5p coins. How many coins do I have?  **True or false?**  When you count up in tens starting at 5 there will always be 5 units. | | | **Making links**  Write the multiplication number sentences to describe this array   |  |  |  | | --- | --- | --- | | X | X | X | | X | X | X |   What do you notice? Write the division sentences.  **Prove It**  Which four number sentences link these numbers? 3, 5, 15? Prove it. | |
| **Curriculum Links** | Money – shopping: finding quantities in multiple purchases, sales prices, sharing costs.  Measurement - calculating area and perimeter, finding journey distances, reading and calculating scales, adjusting recipe quantities.  Data – interpreting and evaluating data, calculating amounts from pie charts and pictograms. | | | | |
| **Concept** | **Statistics** | | | | |
| **National Curriculum** | 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 | | | | |
| **KS1 TAF** | **EXS**  Read scales in divisions of 1s, 2s, 5s & 10s  **GDS**  Reads scales were not all numbers are given & estimate points in between | | | | |
| **White Rose Small Steps** | Make tally charts  Draw pictograms (1-1)  Interpret pictograms (1-1)  Draw pictograms (2, 5 and 10)  Interpret pictograms (2, 5 and 10)  Block diagrams | | | | |
| **Nrich** | [Sticky Data](http://nrich.maths.org/7687) \* G P  [If the World Were a Village](http://nrich.maths.org/7725) \* P I  [Plants](http://nrich.maths.org/36) \*\* P | [What Shape and Colour?](http://nrich.maths.org/public/viewer.php?obj_id=2185)\* G  [Carroll Diagrams](http://nrich.maths.org/public/viewer.php?obj_id=5728) \* P  [Ladybird Count](http://nrich.maths.org/public/viewer.php?obj_id=2341) \* P | | [The Hair Colour Game](http://nrich.maths.org/6964) \*\* G P  [Mixed-up Socks](http://nrich.maths.org/public/viewer.php?obj_id=166) \*\* P I  [Sort the Street](http://nrich.maths.org/public/viewer.php?obj_id=5157) \* P | [Button-up](http://nrich.maths.org/7227) \* P  [Beads and Bags](http://nrich.maths.org/7374) \* P  [In the Playground](http://nrich.maths.org/7248) \* I |
| **Question Bank** | **True or false?**  (Looking at a simple pictogram) “More people travel to work in a car than on a bicycle”. **Is this true or false? Convince me.**  Make up your own ‘true/false’ statement about the pictogram  **What’s the same, what’s different?** Pupils identify similarities and differences between different representations and explain them to each other  **Create a questions** Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives | | | | |
| **Curriculum Links** | Number and Place Value In Science  Living things and their habitats  Non-statutory guidance: Pupils might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts.  Plants  Non-statutory guidance: Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.  Uses of everyday materials  Non-statutory guidance Pupils might work scientifically by: comparing different sound sources and looking for patterns; carrying out tests to find the best places to locate fire bells in school. | | | Sound  Non-statutory guidance Pupils should be encouraged to think about unusual and creative uses for everyday materials. They could ask questions about the movement of objects such as toy cars on different surfaces; comparing them, by measuring how far they go; ordering their findings and recording their observations and measurements, for example by constructing tables and charts, and drawing on their results to answer their questions.  **Real life connections.**  Link with activities that go on in school to give statistics work some relevance and purpose.  Ask children to plan for how they might find out;   * How many children walk to school? * What type of library books are borrowed the most often?   Discuss any graphs or tables that connect to other subjects or in papers or on the internet that the children would find interesting. Atlases are a great source of different types of graphs to discuss. | |
| **Concept** | **Fractions** | | | | |
| **National Curriculum** | Pupils should count in fractions up to 10, starting from any number and using the ½ and 2/4 equivalence on the number line  Recognise, find, name and write fractions 1/3, 1/4, 2/4 and ¾ of a length, shape, set of objects or quantity  Write simple fractions e.g. ½ of 6 = 3 and recognise the equivalence of 2/4 and ½ | | | | |
| **KS1 TAF** | **EXS**  Identify ¼, 1/3, ½, 2/4, ¾ of a number or shape and know all parts must be equal | | | | |
| **White Rose Small Steps** | Make equal parts  Recognise a half  Find a half  Recognise a quarter  Find a quarter  Recognise a third  Find a third  Unit fractions  Non-unit fractions  Equivalence of ½ and 2/4  Find three quarters  Count in fractions | | | | |
| **Nrich** | [Making Longer, Making Shorter](http://nrich.maths.org/5590) \*\* I | | | | |
| **Question Bank** | **Spot the mistake**  7, 7 ½ , 8, 9, 10  8 ½, 8, 7, 6 ½,  … and correct it  **What comes next?**  5 ½, 6 ½, 7 ½, …., ….  9 ½, 9, 8 ½, ……, …. | | **What do you notice?**  ¼ of 4 = 1, ¼ of 8 = 2, ¼ of 12 = 3  Continue the pattern. What do you notice?  **True or false?**  Half of 20cm = 5cm  ¾ of 12cm = 9cm | **Odd one out**.  Which is the odd one out in this trio:  ½ 2/4 ¼ Why?  **What do you notice?**  Find ½ of 8 | Find 2/4 of 8  What do you notice?  **Ordering**  Put these fractions in the correct order, starting with the smallest  ½ ¼ 1/3 |
| **Curriculum Links** | Number and place value, addition and subtraction, multiplication and division, measurement: Time Fractions, in particular halves and quarters, can be linked to many different ‘real-life’ contexts. Children naturally use the term ‘half’ or ‘halve’ in general conversation. Encourage them, and the adults working with them, to refine their use of the word, and try to use it accurately.  Introductions to fractions from Nrich provides a series of 7 useful activities for connecting fractions to other activities, in the form of a trail. | | | | |
| **Concept** | **Length & height** | | | | |
| **National Curriculum** | Compare and order **lengths** and record the results using >, < and =  Choose and use appropriate standard units to estimate and measure **length/height** in any direction (m/cm) to the nearest appropriate unit, using rulers | | | | |
| **KS1 TAF** | **EXS**  Read scales in divisions of 1s, 2s, 5s & 10s  **GDS**  Reads scales were not all numbers are given & estimate points in between | | | | |
| **White Rose Small Steps** | Measure length (cm)  Measure length (m)  Compare lengths  Order lengths  Four operations with lengths | | | | |
| **Nrich** |  | | | | |
| **Question Bank** | **Position the symbols**  Place the correct symbol between the measurements > or <  36cm ? 63cm  Explain your thinking  **Application** (Practical)  Draw two lines whose lengths differ by 4cm. | | | | |
| **Curriculum Links** | Number and place value  Measurement skills are extensively used in every kitchen, every recipe. In school, opportunities arise in other subjects such as science – measuring plant growth and monitoring and recording temperatures, or P.E. – measuring long jumps, counting skips, timing races etc.  Take cross-curricular opportunities to deepen children’s understanding of units of measurement. For example, ask them to:   * find out what measures their parents use in their jobs or in the home; * take measurements of jumps or throws in PE lessons; * use measures in art, design and technology lessons, discussing degrees of accuracy. | | | | |
| **Concept** | **Mass, capacity, temperature** | | | | |
| **National Curriculum** | Compare and order **mass**, **volume/capacity** and record the results using >, < and =  Choose and use appropriate standard units to estimate and measure **mass** (kg/g); **temperature** (°C); **capacity** (litres/ml) to the nearest appropriate unit, using scales, thermometers and measuring vessels | | | | |
| **KS1 TAF** | **EXS**  Read scales in divisions of 1s, 2s, 5s & 10s  **GDS**  Reads scales were not all numbers are given & estimate points in between | | | | |
| **White Rose Small Steps** | Compare mass  Measure mass in grams  Measure mass in kilograms  Compare capacity  Millilitres  Litres  Temperature | | | | |
| **Nrich** |  | | | | |
| **Question Bank** | **Top tips**  Put these measurements in order starting with the smallest.  75 grammes, 85 grammes, 100 grammes Explain your thinking  **Position the symbols**  Place the correct symbol between the measurements > or <  130ml ? 103ml  Explain your thinking | | | | |
| **Curriculum Links** | Number and place value  Measurement skills are extensively used in every kitchen, every recipe. In school, opportunities arise in other subjects such as science – measuring plant growth and monitoring and recording temperatures  Take cross-curricular opportunities to deepen children’s understanding of units of measurement. For example, ask them to:   * find out what measures their parents use in their jobs or in the home | | | | |
| **Concept** | **Time** | | | | |
| **National Curriculum** | 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  Know the number of minutes in an hour and the number of hours in a day. | | | | |
| **KS1 TAF** | **EXS**  Read time to nearest 15mins  **GDS**  Read time to nearest 5mins | | | | |
| **White Rose Small Steps** | O’clock and half past  Quarter past and quarter to  Telling time to 5 minutes  Minutes in an hour, hours in a day  Find durations of time  Compare durations of time | | | | |
| **Nrich** |  | | | | |
| **Question Bank** | **Undoing**  The film finishes two hours after it starts. It finishes at 4.30. What time did it start? Draw the clock at the start and the finish of the film.  **Explain thinking**  The time is 3:15pm. Kate says that in two hours she will be at her football game which starts at 4:15. Is Kate right? Explain why.  **Working backwards**  Draw hands on the clock faces to show when break started and when it finished 15 minutes later at 10:35.  **The answer is ….**  3 hours  What is the question? | | | **What do you notice?**  What do you notice?  1 hour = 60 minutes  ½ hour = 30 minutes  ¼ hour = 15 minutes  Write down some more time facts like these | |
| **Curriculum Links** | Number and place value  Time is a sequence of events that relates to our daily life. Clocks / watches and calendars are tools that measure time.  Measurement skills are extensively used in every kitchen, every recipe. P.E. – measuring long jumps, counting skips, timing races etc.  Take cross-curricular opportunities to deepen children’s understanding of units of measurement. For example, ask them to:   * find out what measures their parents use in their jobs or in the home; | | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Independently find a starting point to break into a problem  With support work systematically  Independently find possibilities  Independently check work *(e.g. look for other possibilities, repeats, missing answers and errors)*  Pattern spot and predict what will come next in a pattern/sequence (numbers, shapes, spatial  With support, investigate statements and conjectures | Explain with reasons and beginning to use given sentence stems and connectives to expand  Listen to others’ explanations, make sense of them and compare and evaluate  Begin to edit and improve their own and a peer’s explanation  Investigate ‘what if?’ questions |

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| **Year 2 Spring Term CFC** | | | | | |
| **Counting** | | **Fact Recall** | | **Calculation** | |
| **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** |
| ***KS1 WTS***  ***Count forwards and backwards, in multiples of 2, from zero, or any other multiple, up to 12x2***  ***KS1 WTS***  ***Count forwards and backwards, in multiples of 10, from zero, or any other multiple, up to 12x10***  ***KS1 WTS***  ***Count forwards and backwards, in multiples of 5, from zero, or any other multiple, up to 12x5*** | Count forwards and backwards, in fractions | ***KS1 EXS***  ***Recall multiples of 2, up to 12x2, in any order, including missing numbers and related division facts***  ***KS1 EXS***  ***Recall multiples of 10, up to 12x10, in any order, including missing numbers and related division facts***  ***KS1 GDS***  ***Make deductions outside known facts***  Derive and recall addition doubles to 20, up to a total of 40  Add multiples of 10, using knowledge of bonds up to 10, within 100 *(20+50, using knowledge of 2+5)*  Subtract multiples of 10, within 100, using knowledge of bonds up to 10, within 100 *(70-30, using knowledge of 7-3)* | ***KS1 EXS***  ***Recall multiples of 2, up to 12x2, in any order, including missing numbers and related division facts***  ***KS1 EXS***  ***Recall multiples of 5, up to 12x5, in any order, including missing numbers and related division facts***  ***KS1 GDS***  ***Make deductions outside known facts***  Derive and recall addition doubles for multiples of 10, up to a total of 100 | Derive complements (bonds) to 100, using knowledge of bonds for 10 and bonds for 100 *(23+77=100, using knowledge of 20+70 (2+7) and 3+7)*  Add three, one-digit numbers, including bridging the ten boundary  ***WTS***  ***Add a one-digit number to any two-digit number, without bridging the ten boundary, within 100***  Add a one-digit number to any two-digit number, bridging the ten boundary, within 100  ***WTS***  ***Add a multiple of 10 and a two-digit number, within 100***  Add 9 to any two-digit number, within 100 *(adding ten and subtracting 1 to adjust)*  Add 11 to any two-digit number, within 100 *(adding ten and 1)*  Add 19, 29 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and subtracting 1 to adjust)*  Add 21, 31 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and 1)*  Add two, two-digit numbers, without bridging the ten boundary, within 100  ***EXS***  ***Add two, two-digit numbers, bridging the ten boundary, within 100***  ***EXS***  ***Add two, two-digit numbers, bridging the ten boundary and the 100 boundary***  Add near addition doubles up to a total of 40, using doubles to 20 *(partition, double and adjust by 1)*  Subtract a one-digit number from a multiple of 10, within 100  **WTS**  ***Subtract a one-digit number from a two-digit number, without bridging the ten boundary, within 100***  Subtract a one-digit number from a two-digit number, bridging the ten boundary, within 100  ***WTS***  ***Subtract a multiple of ten from any two-digit number, within 100***  Subtract 9 from any two-digit number, within 100 *(subtract ten and add 1 to adjust)*  Subtract 11 from any two-digit number, within 100 *(subtract ten and 1)*  Subtract 19, 29 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and subtracting 1 to adjust)*  Subtract 21, 31 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and 1)*  Subtract two, two-digit numbers, without bridging the ten boundary, within 100  ***EXS***  ***Subtract two, two-digit numbers, bridging the ten boundary, within 100*** | |

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| **Year 2 Summer Term Medium Term Planning** | | | | |
| **Concept** | **Problem Solving and Reasoning** | | | |
| **National Curriculum** | Solve problems with addition and subtraction.  Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexct. | | | |
| **KS1 TAF** | WTS  +/- two-digit and ones no regrouping, +/- two-digit and tens no regrouping, count in 2s, 5, 10s and use this to solve problems  EXS  +/- two, two-digits using an efficient strategy, explain method, use x/÷facts for 2, 5 & 10 to solve simple problems  GDS  Use reasoning about numbers and relations to solve more complex problems and explain thinking, solve unfamiliar word problems involving more than one step | | | |
| **White Rose** | **Problem of the Day**  **Barvember Examples** | | | |
| **Nrich** | [Number Round Up](http://nrich.maths.org/188) \*\*\* G P  [4 Dom](http://nrich.maths.org/public/viewer.php?obj_id=179) \*\*\* G P  [Strike it Out](http://nrich.maths.org/6589) \* G  [Cuisenaire Environment](http://nrich.maths.org/public/viewer.php?obj_id=4348) \* G  [Jumping Squares](http://nrich.maths.org/7471) \*\* G  [Number Balance](http://nrich.maths.org/public/viewer.php?obj_id=4725) \*\* I | [Unit Differences](https://nrich.maths.org/10480) \* P I  [The Add and Take-away Path](http://nrich.maths.org/7281) \* I  [Secret Number](http://nrich.maths.org/public/viewer.php?obj_id=5651) \*\* G  [How Many?](http://nrich.maths.org/6927) \* G P  [What Was in the Box?](http://nrich.maths.org/7819) \* G P | [Doing and Undoing](http://nrich.maths.org/8292) \* I  [Getting the Balance](http://nrich.maths.org/public/viewer.php?obj_id=5676) \*\*\* I  [Noah](http://nrich.maths.org/public/viewer.php?obj_id=136) \*\* P  [Eggs in Baskets](http://nrich.maths.org/public/viewer.php?obj_id=2002) \*\* P  [The Brown Family](http://nrich.maths.org/public/viewer.php?obj_id=2003) \*\*\* G P | [Birthday Cakes](http://nrich.maths.org/public/viewer.php?obj_id=246) \*\* P  [Sitting Round the Party Tables](http://nrich.maths.org/7228) \* P I  [Cuisenaire Counting](http://nrich.maths.org/2724) \*\*\* G P  [Two Spinners](https://nrich.maths.org/10391) \* I |
| [Odd Times Even](http://nrich.maths.org/8062) \*\*\* I  [Two Numbers Under the Microscope](http://nrich.maths.org/8059) \*\* I  [Even and Odd](http://nrich.maths.org/6895) \* I  [Ring a Ring of Numbers](http://nrich.maths.org/public/viewer.php?obj_id=2782) \* G  [More Numbers in the Ring](http://nrich.maths.org/2783) \*\*\* G P | [How Odd](http://nrich.maths.org/7190) \*\* I  [Doing and Undoing](http://nrich.maths.org/8292) \* I  [Clapping Times](http://nrich.maths.org/public/viewer.php?obj_id=5482) \* G I  [Ordering Cards](http://nrich.maths.org/8058) \* G  [Which Symbol?](http://nrich.maths.org/6777) \* P | [I’m Eight](http://nrich.maths.org/55) \* I  [Our Numbers](http://nrich.maths.org/7006) \* G  [Are You Well Balanced?](http://nrich.maths.org/public/viewer.php?obj_id=4734) \*\*\* G I  [Magic Plant](http://nrich.maths.org/public/viewer.php?obj_id=145) \*\* P  [The Amazing Splitting Plant](http://nrich.maths.org/public/viewer.php?obj_id=159) \*\*\* P | [The Tomato and the Bean](http://nrich.maths.org/public/viewer.php?obj_id=1079) \*\*\* P  [Lots of Lollies](http://nrich.maths.org/public/viewer.php?obj_id=2360) \*\*\* P I  [Ip Dip](http://nrich.maths.org/7185) \* I |
| **Question Bank** |  | | | |
| **Curriculum Links** |  | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations (concrete, pictorial, abstract)  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Independently find a starting point to break into a problem  With support work systematically  Independently find possibilities  Independently check work (e.g. look for other possibilities, repeats, missing answers and errors)  Pattern spot and predict what will come next in a pattern/sequence (numbers, shapes, spatial  With support, investigate statements and conjectures | Explain with reasons and beginning to use given sentence stems and connectives to expand  Listen to others’ explanations, make sense of them and compare and evaluate  Begin to edit and improve their own and a peer’s explanation  Investigate ‘what if?’ questions |

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| **Year 2 Summer Term CFC** | | | | | |
| **Counting** | | **Fact Recall** | | **Calculation** | |
| **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** |
| Count forwards and backwards, in multiples of 3, from zero, or any other multiple, up to 12 x 3  Count forwards and backwards, in fractions | Count forwards and backwards, in multiples of 3, from zero, or any other multiple, up to 12 x 3 | ***KS1 EXS***  ***Recall multiples of 2, up to 12x2, in any order, including missing numbers and related division facts***  ***KS1 EXS***  ***Recall multiples of 5, up to 12x5, in any order, including missing numbers and related division facts***  ***KS1 GDS***  ***Make deductions outside known facts***  Derive and recall addition doubles to 20, up to a total of 40  Add multiples of 10, using knowledge of bonds up to 10, within 100 *(20+50, using knowledge of 2+5)*  Subtract multiples of 10, within 100, using knowledge of bonds up to 10, within 100 *(70-30, using knowledge of 7-3)* | ***KS1 EXS***  ***Recall multiples of 5 up to 12x5, in any order, including missing numbers and related division facts***  ***KS1 GDS***  ***Make deductions outside known facts***  Derive and recall addition doubles for multiples of 10, up to a total of 100 | Derive complements (bonds) to 100, using knowledge of bonds for 10 and bonds for 100 *(23+77=100, using knowledge of 20+70 (2+7) and 3+7)*  Add three, one-digit numbers, including bridging the ten boundary  ***WTS***  ***Add a one-digit number to any two-digit number, without bridging the ten boundary, within 100***  Add a one-digit number to any two-digit number, bridging the ten boundary, within 100  ***WTS***  ***Add a multiple of 10 and a two-digit number, within 100***  Add 9 to any two-digit number, within 100 *(adding ten and subtracting 1 to adjust)*  Add 11 to any two-digit number, within 100 *(adding ten and 1)*  Add 19, 29 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and subtracting 1 to adjust)*  Add 21, 31 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and 1)*  Add two, two-digit numbers, without bridging the ten boundary, within 100  ***EXS***  ***Add two, two-digit numbers, bridging the ten boundary, within 100***  ***EXS***  ***Add two, two-digit numbers, bridging the ten boundary and the 100 boundary***  Add near addition doubles up to a total of 40, using doubles to 20 *(partition, double and adjust by 1)*  Subtract a one-digit number from a multiple of 10, within 100  **WTS**  ***Subtract a one-digit number from a two-digit number, without bridging the ten boundary, within 100***  Subtract a one-digit number from a two-digit number, bridging the ten boundary, within 100  ***WTS***  ***Subtract a multiple of ten from any two-digit number, within 100***  Subtract 9 from any two-digit number, within 100 *(subtract ten and add 1 to adjust)*  Subtract 11 from any two-digit number, within 100 *(subtract ten and 1)*  Subtract 19, 29 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and subtracting 1 to adjust)*  Subtract 21, 31 etc. to any two-digit number, within 100 *(adding 20, 30 etc. and 1)*  Subtract two, two-digit numbers, without bridging the ten boundary, within 100  ***EXS***  ***Subtract two, two-digit numbers, bridging the ten boundary, within 100*** | |

**Year 3: Long Term Plan**

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| ***Y3*** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | | **10** | | **11** | **12** | **13** | **14** | **15** |
| **TERM 1** | Counting, number & place value | | | Addition & subtraction | | | | | Multiplication & division | | | | |  | | | |
| **TERM 2** | Multiplication & division | | | Money | Statistics | | Length & perimeter | | | | | Fractions | |  |  | | |
| **TERM 3** | Fractions | | | Time | | | Properties of shapes | | | Mass & capacity | | | |  | |  | |

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| **Year 3 Autumn Term Medium Term Planning** | | | | |
| **Concept** | **Counting, number & place value** | | | |
| **National Curriculum** | Count from 0 in multiples of 4, 8, 50 and 100;  Find 10 or 100 more or less than a given number  Compare and order numbers up to 1 000  Identify, represent and estimate numbers using different representations  Read and write numbers up to 1 000 in numerals and in words  Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)  Solve number problems and practical problems involving these ideas. | | | |
| **White Rose Small Steps** | Hundreds  Represent numbers to 1,000  100s, 10s and 1s (1)  100s, 10s and 1s (2)  Number line to 1,000  Find 1, 10, 100 more or less than a given number  Compare objects to 1,000  Compare numbers to 1,000  Order numbers  Count in 50s | | | |
| **Nrich** | [How Would We Count?](http://nrich.maths.org/8123) \* P  [Coded Hundred Square](https://nrich.maths.org/6554) \* P  [Which Scripts?](http://nrich.maths.org/774) \* P  [Take Three Numbers](http://nrich.maths.org/8063) \* I  [Three Neighbours](http://nrich.maths.org/8108) \*\* I  [Prison Cells](http://nrich.maths.org/public/viewer.php?obj_id=934) \*\* G P  [Spot Thirteen](http://nrich.maths.org/7513) \* G P  [Square Subtraction](http://nrich.maths.org/8065) \*\*\* I  [Planning a School Trip](http://nrich.maths.org/6969) \* p | | [Magic Vs](http://nrich.maths.org/public/viewer.php?obj_id=6274) \*\* P  [Number Differences](http://nrich.maths.org/2790) \* G P  [Sitting Round the Party Tables](http://nrich.maths.org/7228) \* P  [Dotty Six](http://nrich.maths.org/7337) \* G  [Nim-7](https://nrich.maths.org/1204) \* G  [Number Match](https://nrich.maths.org/6937) \* G  [Cubes Here and There](https://nrich.maths.org/6119) \* I  [A Mixed-up Clock](http://nrich.maths.org/2127) \* P | |
| **Question Bank** | **Spot the mistake**:  50,100,115,200  What is wrong with this sequence of numbers?  **True or False?**  38 is a multiple of 8?  **What comes next?**  936-10= 926, 926 -10 = 916, 916- 10= 906  **Do, then explain**  835 535 538 388 508  If you wrote these numbers in order starting with the smallest, which number would be third?  Explain how you ordered the numbers. | | **Do, then explain**  Show the3 value of the digit 3 in these numbers?  341 503 937  Explain how you know.  **Make up an example** Create numbers where the digit sum is three.  E.g. 120, 300, 210  What is the largest/smallest number? | |
| **Curriculum Links** | In **fractions** work:  Pupils count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10  Pupils connect tenths to place value, decimal measures and to division by 10. They begin to understand unit and non-unit fractions as numbers on the number line and deduce relations between them such as size and equivalence (non-statutory)  In work on **measures**:  Measure and compare: lengths (m/cm/mm); Mass (kg/g); volume (l/ml)  Pupils continue to measure using appropriate tools and units, progressing to a wider range of measures, including comparing and using mixed units (e.g. 1kg and 200g) and simple equivalents of mixed units (e.g. 5m = 500cm)  The comparison of measures should also include simple scaling by integers (non-statutory) | | Learners will encounter numbers and place value in many contexts and begin to explore their significance.   * Comparing quantities in real life contexts such as counting those present in school or having school dinners * Comparing measures such as length, weight or volume of different objects * Organising data can draw attention to aspects of place value for instance through collecting information about pets that others have or the distances that they travel to get to school. * School sports day can offer opportunities for counting and measuring and comparing quantities * Activities such as counting the number of seeds in a packet can support children’s understandings of large numbers and help them to see the value of strategies such as rounding to the nearest 10 | |
| **Concept** | **Addition & subtraction** | | | |
| **National Curriculum** | Add and subtract numbers mentally, including:   * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds   Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction  Estimate the answer to a calculation and use inverse operations to check answers  Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction | | | |
| **White Rose Small Steps** | Add and subtract multiples of 100  Add and subtract 3-digit numbers and ones – not crossing 10  Add 3-digit and 1-digit numbers – crossing 10  Subtract a 1-digit number from a 3-digit number – crossing 10  Add and subtract 3-idgit numbers and tens – not crossing 100  Add a 3-digit number and tens – crossing 100  Subtract tens from a 3-digit number – crossing 100  Add and subtract 100s  Spot the pattern – making it explicit  Add and subtract a 2-digit and 3-digit number – not crossing 10 or 100  Add a 2-digt and 3-digit number – crossing 10 or 100  Subtract a 2-digit number from a 3-digit number – cross the 10 or 100 Add two 3-digit numbers – not crossing 10 or 100  Add two 3-digit numbers – crossing 10 or 100  Subtract a 3-digit number from a 3-digit number – no exchange  Subtract a 3-digit number from a 3-digit number – exchange  Estimate answers to calculations  Check | | | |
| **Nrich** | [How Do You See it?](http://nrich.maths.org/8296) \* P  [Swimming Pool](http://nrich.maths.org/public/viewer.php?obj_id=5836)\* P  [First Connect Three](http://nrich.maths.org/public/viewer.php?obj_id=5865) \* G P  [Sea Level](http://nrich.maths.org/public/viewer.php?obj_id=5929) \* P I  [A Bit of a Dicey Problem](http://nrich.maths.org/1077) \*\*\* P  Totality \* G  [A Square of Numbers](http://nrich.maths.org/public/viewer.php?obj_id=2005) \* G P  [Buying a Balloon](http://nrich.maths.org/public/viewer.php?obj_id=186) \* P | | [GOT IT](http://nrich.maths.org/public/viewer.php?obj_id=1272) \*\* G  [Make 37](http://nrich.maths.org/public/viewer.php?obj_id=1885) \*\* P  [Consecutive Numbers](http://nrich.maths.org/public/viewer.php?obj_id=31) \*\* P I  [Super Shapes](http://nrich.maths.org/public/viewer.php?obj_id=1056) \* P  [Strike it Out](http://nrich.maths.org/6589) \* G  [Dice in a Corner](https://nrich.maths.org/8586) \*\*\* P I  [Domino Square](http://nrich.maths.org/146) \*\* P | |
| **Question Bank** | **True or false?**  Are these number sentences true or false?  597 + 7 = 614, 804 – 70 = 744, 768 + 140 = 908 Give your reasons.  **Hard and easy questions**  Which questions are easy / hard?  323 + 10 =, 393 + 10 =, 454 - 100 =, 954 - 120 =  Explain why you think the hard questions are hard?  **Making an estimate**  Which of these number sentences have the answer that is between 50 and 60?  174 - 119 | 333 – 276  932 - 871  **Always, sometimes, never**  Is it always, sometimes or never true that if you subtract a multiple of 10 from any number the ones digit of that number stays the same?  Is it always, sometimes or never true that when you add two numbers together you will get an even number  **Convince me**  ?? + ?? + ??  The total is 201  Each missing digit is either a 9 or a 1. Write in the missing digits. | | Is there only one way of doing this or lots of ways? Convince me  **Possibilities**  I bought a book which cost between £9 and £10 and I paid with a ten-pound note.  My change was between 50p and £1 and was all in silver coins.  What price could I have paid?  **Connected Calculations**  Put the numbers 3, 12, 36 in the boxes to make the number sentences correct.  ? = ? x ?  ? = ? ÷ ? |
| **Curriculum Links** | Children need to be able to apply the concept of addition to real−life applications, for example the total cost of two items costing 48p and 36p. They may then need to be able to convert their answer into the appropriate units.   * To complement a garden centre/shop role-play area, or similar class theme, ask children to explore the cost of buying combinations of different items on paper or on a spreadsheet. The shop/market stall could link to a historical theme e.g. in Roman times. * Give children a limited budget to buy items for a party. Often shops have free coloured leaflets with listed items for sale or on special offer , e.g. ‘buy one get one free’ or ‘three for two’. | | * Make collections of biscuits/cakes/healthy snacks to sell and raise money for school fund or charity like Comic Relief or Children in Need. * Visit a local shop or museum shop as part of a class trip. You have £2, £3 or £4, what can you buy with your money? What can’t you buy? How much more money might you need? How much change will you get? Have you got the correct change? | |
| **Concept** | **Multiplication & division** | | | |
| **National Curriculum** | Count from 0 in multiples of 4, 8, 50 and 100  Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables  Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods  Estimate the answer to a calculation and use inverse operations to check answers  Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects | | | |
| **White Rose Small Steps** | Multiplication – equal groups  Multiplying by 3  Dividing by 3  The 3 times-table  Multiplying by 4  Dividing by 4  The 4 times-table  Multiplying by 8  Dividing by 8  The 8 times-table | | | |
| **Nrich** | [Ordering Cards](http://nrich.maths.org/8058) \* G P  [Music to My Ears](http://nrich.maths.org/public/viewer.php?obj_id=5483) \* P I  [A Square of Numbers](http://nrich.maths.org/public/viewer.php?obj_id=2005) \* G P  [What do you Need?](http://nrich.maths.org/public/viewer.php?obj_id=5950) \* P  [This Pied Piper of Hamelin](http://nrich.maths.org/8315) \*\* P | | [Follow the Numbers](http://nrich.maths.org/7127) \* P I  [What's in the Box?](http://nrich.maths.org/public/viewer.php?obj_id=5576) \* P  [How Do You Do It?](http://nrich.maths.org/6901) \* P  [Ip Dip](https://nrich.maths.org/7185) \* I | |
| **Question Bank** | **Missing numbers**  24 = ? x ?  Which pairs of numbers could be written in the boxes?  **Making links** Cards come in packs of 4. How many packs do I need to buy to get 32 cards?  **Use a fact**  20 x 3 = 60.  Use this fact to work out  21 x 3 = 22 x 3 = 23 x 3 = 24 x 3 =  **Making links**  4 × 6 = 24  How does this fact help you to solve these calculations?  40 x 6 =, 20 x 6 =, 24 x 6 =  **Use the inverse**  Use the inverse to check if the following calculations are correct  23 x 4 = 82  117 ÷ 9 = 14 | | **Size of an answer**  Will the answer to the following calculations be greater or less than 80?  23 x 3=, 32 x 3 =, 42 x 3 =, 36 x 2=  **Prove It**  What goes in the missing box?   |  |  |  | | --- | --- | --- | | x | ? | ? | | 4 | 80 | 12 |   Prove it.  **How close can you get?**  ?? × ?  Using the digits 2, 3 and 4 in the calculation above how close can you get to 100? What is the largest product? What is the smallest product?  **Connected Calculations**  Put the numbers 3, 12, 36 in the boxes to make the number sentences correct.  ? = ? x ?  ? = ? ÷ ? | |
| **Curriculum Links** | When focusing on aspects of ‘Number and Place Value’ in Year 3, in particular when counting in steps of 4, 8, 50 and 100, children will have the opportunity to link with work on multiplication and division.  When interpreting and presenting data using bar charts, pictograms and tables in Year 3, children can use their knowledge of multiplication facts when creating and reading scales and data sets.  Learners will encounter aspects of multiplication and division when working on area, relating to arrays. Problem solving work involving finding all possibilities and combinations also draws on knowledge of multiplication tables facts.  Fractions work within other curriculum areas and in real life links naturally to multiplication and division work.  The notion of equal groups can emerge in many different activities and contexts, e.g. when packing boxes, purchasing quantities of items for several people etc. | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Independently find an efficient way to solve a range of problems  Independently work systematically  Independently find possibilities using patterns spotted to support  Independently check and improve work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve)*  Pattern spot and predict what will come next in a pattern/sequence *(numbers, shape or spatial)*  Independently investigate conjectures and provide examples and counter-examples  When they have solved a problem, pose a similar problem for a peer | Provide a convinced argument  Reflect on others’ convinced explanations and use this to improve their work  Edit and improve their own and a peer’s convinced explanation  Investigate ‘what if?’ questions  Create ‘what if?’ questions |

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| **Year 3 Autumn Term CFC** | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | |
| **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** |
| Count forwards and backwards, in multiples of 50, from zero or any other multiple  Count forwards and backwards, in multiples of 100, from zero or any other multiple  Count forwards and backwards, in multiples of 3, from zero, or any other multiple, up to 12x3 | Count forwards and backwards, in multiples of 4, from zero, or any other multiple, up to 12x4  Count forwards and backwards, in multiples of 8, from zero, or any other multiple, up to 12x8 | Recall ‘1, 10 and 100 more’ facts, within 1000  Recall ‘1, 10 and 100 less’ facts, within 1000  Derive and recall addition facts, within 100, using bonds to 10 to support *(27+3, 36+14)*  Derive and recall sums of multiples of 10 *(40+30, 50+80 (bridge))*    Derive and recall addition doubles for all numbers to 50, up to a total of 100 *(42+42, 46+46 (bridging))*  Derive and recall addition doubles for multiples of 10, up to a total of 200  Derive and recall addition doubles for multiples of 100, up to a total of 1000  Derive and recall differences of multiples of 10 *(80-40, 120-90 (bridge))*  Derive and recall what must be added to any three-digit number to make the next multiple of 100 *(521+? =600)*  Add multiples of 100, within 1000  Subtract multiples of 100, within 1000  Add a multiple of 100 and a three-digit number *(200+356 or 356+200)*  Subtract a multiple of 100 from a three-digit number, within 1000 *(872-300)* | Derive and recall doubles to 20, up to a total to 40, and the corresponding halves  Derive and recall doubles of multiples of 10, up to a total of 200, and the corresponding halves  Double any multiple of 5, up to a total of 100  Halve any multiple of 10 up to 200,  Halve any even number to 100  Recall multiples of 3, up to 12x3, in any order, including missing numbers and related division facts | Add near addition doubles up to a total of 40, with a difference of 2, using doubles to 20 *(partition, double and adjust by 2)*  Add near addition doubles of multiples of 10, with a difference of 10 *(partition, double and adjust by 10)*  Add a near multiple of 10 *(56 +29)*  Subtract a near multiple of 10 *(56 -29)*  Add a multiple of 10 and a three-digit number *(50+342 or 342+50, 70+342 or 342+70 (bridging))*  Subtract a multiple of ten from a three-digit number *(564-30, 742-60 (bridging))*  Add 9, 19, 29, 39 etc. to any three-digit number *(adding 10, 20, 30 etc. and subtracting 1 to adjust)*  Subtract 9, 19, 29, 39 etc. from any three-digit number  *(subtracting 10, 20, 30 etc. and adding 1 to adjust)*  Add 11, 21, 31, 41 etc. to any three-digit number *(adding 10, 20, 30 etc. and 1)*  *Subtracting 11, 21, 31, 41 etc. to any three-digit number (subtracting 10, 20, 30 etc. and 1)*  Add three-digit multiples of 10 *(620+280)*  Subtract three-digit multiples of 10 *(620-380)*  Add a three-digit number and a one-digit number, without bridging the ten boundary  Subtract a one-digit number from a three-digit number, without bridging the ten boundary  Add a three-digit number and a one-digit number, bridging the ten boundary  Subtract a one-digit number from a three-digit number, bridging the ten boundary  Add a three-digit number and a two-digit number, without bridging the ten boundary  Subtract a three-digit number and a two-digit number, without bridging the ten boundary  Add a three-digit number and a two-digit number, bridging the ten boundary  Subtract a three-digit number and a two-digit number, bridging the ten boundary  Add a three-digit number and a two-digit number, bridging the ten boundary and the 100 boundary. | Multiply by 2, 5 & 10  Divide by 2, 5 & 10  Identify the remainder when dividing by 2, 5 or 10  Multiply by 3, 4 & 8  Divide by 3, 4 & 8 | Add numbers with up to three digits, using a formal written method *(column addition)*  Subtract numbers with up to three digits, using a formal written method *(column subtraction)* | |

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| **Year 3 Spring Term Medium Term Planning** | | | | |
| **Concept** | **Multiplication & division** | | | |
| **National Curriculum** | Count from 0 in multiples of 4, 8, 50 and 100  Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables  Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods  Estimate the answer to a calculation and use inverse operations to check answers  Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects | | | |
| **White Rose Small Steps** | Comparing statements  Related calculation  Multiply 2-digits by 1-digit  Divide 2-digts by 1-digit  Scaling  How many ways? | | | |
| **Nrich** | [Ordering Cards](http://nrich.maths.org/8058) \* G P  [Music to My Ears](http://nrich.maths.org/public/viewer.php?obj_id=5483) \* P I  [A Square of Numbers](http://nrich.maths.org/public/viewer.php?obj_id=2005) \* G P  [What do you Need?](http://nrich.maths.org/public/viewer.php?obj_id=5950) \* P  [This Pied Piper of Hamelin](http://nrich.maths.org/8315) \*\* P | | [Follow the Numbers](http://nrich.maths.org/7127) \* P I  [What's in the Box?](http://nrich.maths.org/public/viewer.php?obj_id=5576) \* P  [How Do You Do It?](http://nrich.maths.org/6901) \* P  [Ip Dip](https://nrich.maths.org/7185) \* I | |
| **Question Bank** | **Missing numbers**  24 = ? x ?  Which pairs of numbers could be written in the boxes?  **Making links** Cards come in packs of 4. How many packs do I need to buy to get 32 cards?  **Use a fact**  20 x 3 = 60.  Use this fact to work out  21 x 3 = 22 x 3 = 23 x 3 = 24 x 3 =  **Making links**  4 × 6 = 24  How does this fact help you to solve these calculations?  40 x 6 =, 20 x 6 =, 24 x 6 =  **Use the inverse**  Use the inverse to check if the following calculations are correct  23 x 4 = 82  117 ÷ 9 = 14 | | **Size of an answer**  Will the answer to the following calculations be greater or less than 80?  23 x 3=, 32 x 3 =, 42 x 3 =, 36 x 2=  **Prove It**  What goes in the missing box?   |  |  |  | | --- | --- | --- | | x | ? | ? | | 4 | 80 | 12 |   Prove it.  **How close can you get?**  ?? × ?  Using the digits 2, 3 and 4 in the calculation above how close can you get to 100? What is the largest product? What is the smallest product?  **Connected Calculations**  Put the numbers 3, 12, 36 in the boxes to make the number sentences correct.  ? = ? x ?  ? = ? ÷ ? | |
| **Curriculum Links** | When focusing on aspects of ‘Number and Place Value’ in Year 3, in particular when counting in steps of 4, 8, 50 and 100, children will have the opportunity to link with work on multiplication and division.  When interpreting and presenting data using bar charts, pictograms and tables in Year 3, children can use their knowledge of multiplication facts when creating and reading scales and data sets.  Learners will encounter aspects of multiplication and division when working on area, relating to arrays. Problem solving work involving finding all possibilities and combinations also draws on knowledge of multiplication tables facts.  Fractions work within other curriculum areas and in real life links naturally to multiplication and division work.  The notion of equal groups can emerge in many different activities and contexts, e.g. when packing boxes, purchasing quantities of items for several people etc. | | | |
| **Concept** | **Money** | | | |
| **National Curriculum** | Add and subtract amounts of money to give change, using both £ and p in practical contexts | | | |
| **White Rose Small Steps** | Pounds and pence  Converting pounds and pence  Adding money  Subtracting money  Giving change | | | |
| **Nrich** |  | | | |
| **Question Bank** |  | | | |
| **Curriculum Links** | **Addition and subtraction**  Finding totals and change in money problems, e.g. Ali spent £2.50 on a packet of pencils and £4.75 on a pencil case. What was her change from £10? | | | |
| **Concept** | **Statistics** | | | |
| **National Curriculum** | Interpret and present data using bar charts, pictograms and tables  Solve one-step and two-step questions [e.g. ‘How many more?’ and ‘How many fewer?’] using information presented in scaled bar charts and pictograms and tables. | | | |
| **White Rose Small Steps** | Pictograms  Bar Charts  Tables | | | |
| **Nrich** | [Our Sports](http://nrich.maths.org/7779) \* I  [Class 5’s Names](http://nrich.maths.org/7522) \* P  [Going for Gold](http://nrich.maths.org/7800) \* I  [The Domesday Project](http://nrich.maths.org/7554) \* I  [The Car That Passes](http://nrich.maths.org/7249) \* I | | [Now and Then](http://nrich.maths.org/8171) \*\* P  [Real Statistics](http://nrich.maths.org/public/viewer.php?obj_id=4938) \*\*\* P  [If the World Were a Village](http://nrich.maths.org/7725) \* P  [It's a Tie](http://nrich.maths.org/public/viewer.php?obj_id=5516) \*\* I  [The Olympic Flame: Are You in the 95%?](http://nrich.maths.org/7822) \* P | |
| **Question Bank** | **True or false?** (Looking at a bar chart) “Twice as many people like strawberry than lime”.  **Is this true or false?**  **Convince me.**  Make up your own ‘true/false’ statement about the bar chart.  **What’s the same, what’s different?**  Pupils identify similarities and differences between different representations and explain them to each other  **Create a questions** Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives. | | | |
| **Curriculum Links** | Number and place value When working on statistics and/or number and place value, there are opportunities to make connections between them, for example:  When learning about number and place value the children are expected to count in and use multiples of 2, 3, 4, 5, 8, 10, 50 and 100. When presenting data, the children are expected to use simple scales for example, 2, 5, 10 units per centimetre, in pictograms and bar charts. The connections between the two are obvious! Give the children opportunities to practise using the required multiples when creating bar charts and pictograms. You could ask the class to pick their favourite food, pet or sport from a given list and then to make a bar chart or pictogram choosing the scale that they think is most appropriate. Addition and subtraction When working on statistics and/or addition and subtraction, there are opportunities to make connections between them, for example:  The requirements for statistics include solving one and two step problems, answering ‘How many more?’ and ‘How many fewer?’ questions using information that is presented in bar charts, pictograms and tables. Clearly, solving such problems requires the ability to add and subtract. When covering these concepts, you could provide the children with copies of bar charts, pictograms and tables and ask them to then make up and solve problems involving addition and subtraction | | Properties of shape  When working on statistics and/or geometry: properties of shape, there are opportunities to make connections between them, for example:  During the children’s work on properties of shape, give them opportunities to sort a variety of 2D and/or 3D shapes into Venn and Carroll diagrams according to criteria that they choose for themselves.  Within the science curriculum there are opportunities to work with statistics, for example, in working scientifically there is a requirement that the children record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. In the section on magnets children should sort materials into those that are magnetic and those that are not. This can be done using tables or single criteria Venn and Carroll diagrams.  Within the geography curriculum, the children are expected to describe and understand key aspects of:   physical geography, including: climate zones, biomes and vegetation belts, rivers, mountains, volcanoes and earthquakes, and the water cycle  human geography, including: types of settlement and land use, economic activity including trade links, and the distribution of natural resources including energy, food, minerals and water  Give the children opportunities to gather relevant data and present it in tables, bar charts or pictograms and then analyse their findings. | |
| **Concept** | **Length & perimeter** | | | |
| **National Curriculum** | Measure, compare, add and subtract: lengths (m/cm/mm)  Measure the perimeter of simple 2-D shapes | | | |
| **White Rose Small Steps** | Measure length  Equivalent lengths – m and cm  Equivalent lengths – mm and cm  Compare lengths  Add lengths  Subtract lengths  Measure perimeter  Calculate perimeter | | | |
| **Nrich** | [Olympic Starters](http://nrich.maths.org/8170) \* I  Car Journey \* I | | | |
| **Question Bank** | **Position the symbols**  Place the correct symbol between the measurements > or <  306cm ? Half a metre  **Testing conditions**  A square has sides of a whole number of centimetres.  Which of the following measurements could represent its perimeter?8cm 18cm 24cm 25cm | | | |
| **Curriculum Links** | **Addition and subtraction**  Adding/subtracting different lengths  **Multiplication and division**  Comparing measurements, e.g. this pencil is 5cm in length. That pencil is 3 times longer. How long is the longer pencil?  **Fractions**  A millimetre is 1/10 of a centimetre  Measurement is a practical application of mathematics in real life. For example, during most days of our lives we work with money. We often estimate and/or calculate length, mass, capacity and time e.g. how long it will take us to travel somewhere, what time we need to leave home to get to an appointment, how much water to put in the kettle to make a mug of coffee.  Within the science curriculum there are many opportunities to connect with measurement, for example in the Programme of Study: working scientifically, it states that during years 3 and 4, pupils should be taught to use practical scientific methods, processes and skills through the teaching of the programme of study content, e.g.  setting up simple practical enquiries, comparative and fair tests  making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers  Within history, see, for example: [**Roman numbers**](https://www.ncetm.org.uk/resources/11689), [**The history of our money**](https://www.ncetm.org.uk/resources/15651), [**The history of length**](https://www.ncetm.org.uk/resources/16072), [**The history of mass**](https://www.ncetm.org.uk/resources/16771), [**The history of volume and capacity**](https://www.ncetm.org.uk/resources/17510), [**The history of time**](https://www.ncetm.org.uk/resources/18012)  Within art, see for example, the [**work of Kandinsky**](https://www.ncetm.org.uk/resources/15650). | | | |
| **Concept** | **Fractions** | | | |
| **National Curriculum** | Count up and down in tenths  Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators  Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.  Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators  Solve problems that involve all the above | | | |
| **White Rose Small Steps** | Unit and non-unit fractions  Making the whole  Count in tenths  Tenths as decimals  Fractions of a number line  Fractions of a set of objects | | | |
| **Nrich** | Fraction Match \* G  [Matching Fractions](http://nrich.maths.org/8283) \* G | | | |
| **Question Bank** | **Spot the mistake**  six tenths, seven tenths, eight tenths, nine tenths, eleven tenths  … and correct it.  **What comes next?**  6/10, 7/10, 8/10, …., ….  12/10, 11/10, …., …., ….  **What do you notice?**  1/10 of 10 = 1 2/10 of 10 = 2 3/10 of 10 = 3  Continue the pattern. What do you notice?  What about 1/10 of 20? Use this to work out 2/10 of 20, etc. | **True or false?**  2/10 of 20cm = 2cm 4/10 of 40cm = 4cm 3/5 of 20cm = 12cm  Give an example of a fraction that is less than a half.  Now another example that no one else will think of.  Explain how you know the fraction is less than a half. (draw an image)  Ben put these fractions in order starting with the smallest. Are they in the correct order?  One fifth, one seventh, one sixth | **Odd one out**.  Which is the odd one out in each of these trios  ½ 3/6 5/8  3/9 2/6 4/9  Why?  **What do you notice?**  Find 2/5 of 10  Find 4/10 of 10. | What do you notice?  Can you write any other similar statements?  **What do you notice?**  1/10 + 9/10 = 1 2/10 + 8/10 = 1 3/10 + 7/10 = 1  **Continue the pattern**  Can you make up a similar pattern for eighths?  The answer is 5/10, what is the question? (involving fractions / operations) |
| **Curriculum Links** | Connect fractions to a clock face and to reading the time. It is quarter past 12. What time will it be two- and three-quarter hours later?  Begin to extend their knowledge of the number system to include decimal numbers and fractions they have met so far. Make connections with a range of representations, for example: arrow cards, Dienes, bead string, 100 sq. Understand the difference between fractions as ordinal numbers (as numbers on a number line), fractions as being a special kind of cardinal number (the answer to 1/2 of a number depends on the quantity you are using) and fractions as operators (What is ½ of 30? What is 2/3 of 45?).  Connect fractions to a range of units of measurement. For example, how many millilitres in ½ a litre? What is ¾ of 2kg?  Connect fractions to division through the concepts of equal sharing and grouping. For example, equal sharing between 2 people results in them having a half each. Equal sharing between four people results in them having a quarter each. OR There are 4 groups of 3 in 12, so 3 must be a quarter of 12.uares.  Learners will encounter fractions in:  Sharing: build on children’s earliest experiences of fractions which are associated with sharing food, toys and money etc. with family and friends.  Money – shopping: comparing prices, sales (1/2 price) Measurement: Link to scaling and proportion, for example, halving recipes  Fractions all around us: What fractions can you see in the classroom, around the school, in the local environment? For example, what fraction of the class are boys, girls or adults? What fraction of the class have pets? | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Independently find an efficient way to solve a range of problems  Independently work systematically  Independently find possibilities using patterns spotted to support  Independently check and improve work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve)*  Pattern spot and predict what will come next in a pattern/sequence *(numbers, shape or spatial)*  Independently investigate conjectures and provide examples and counter-examples  When they have solved a problem, pose a similar problem for a peer | Provide a convinced argument  Reflect on others’ convinced explanations and use this to improve their work  Edit and improve their own and a peer’s convinced explanation  Investigate ‘what if?’ questions  Create ‘what if?’ questions |

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| **Year 3 Spring Term CFC** | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | |
| **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** |
| Count forwards and backwards, in multiples of 4, from zero, or any other multiple, up to 12x4  Count forwards and backwards, in multiples of 8, from zero, or any other multiple, up to 12x8 | Count forwards and backwards, in multiples of 8, from zero, or any other multiple, up to 12x8  Count up and down in tenths | Recall multiples of 3, up to 12x3, in any order, including missing numbers and related division facts | Recall multiples of 4, up to 12x4, in any order, including missing numbers and related division facts | Multiply a two-digit by a one-digit without crossing boundaries *(13 x 3)*  Multiply a two-digit by a one-digit crossing tens boundary *(13 x 4)*  Multiply a two-digit by a one-digit crossing the tens and hundred boundary *(33x4)*  Divide a two-digit by a one-digit without crossing boundaries *(48÷4)*  Divide a two-digit by a one-digit crossing boundaries (*72÷4)*  Divide a two-digit by a one-digit with reminders | Multiple a one-digit number by 10  Divide a one-digit number by 10 *(whole number answers)*  Multiple a two-digit number by 10  Divide a one-digit number by 10 *(1.d.p.)* | Multiply a two-digit number by a one-digit number (*short multiplication)* | Add money *(2.d.p.)* using *(column addition)*  Subtract money to find change *(2.d.p.)* using *(column subtraction)* |

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| **Year 3 Summer Term Medium Term Planning** | | | |
| **Concept** | **Fractions** | | |
| **National Curriculum** | Count up and down in tenths  Compare and order unit fractions, and fractions with the same denominators  Recognise and show, using diagrams, equivalent fractions with small denominators  Add and subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7)  Solve problems that involve all of the above | | |
| **White Rose Small Steps** | Equivalent fractions  Compare fractions  Order fractions  Add fractions  Subtract fractions | | |
| **Nrich** | Fraction Match \* G  [Matching Fractions](http://nrich.maths.org/8283) \* G | | |
| **Question Bank** | **Spot the mistake**  six tenths, seven tenths, eight tenths, nine tenths, eleven tenths  … and correct it.  **What comes next?**  6/10, 7/10, 8/10, …., ….  12/10, 11/10, …., …., ….  **What do you notice?**  1/10 of 10 = 1 2/10 of 10 = 2 3/10 of 10 = 3  Continue the pattern. What do you notice?  What about 1/10 of 20? Use this to work out 2/10 of 20, etc.  **True or false?**  2/10 of 20cm = 2cm 4/10 of 40cm = 4cm 3/5 of 20cm = 12cm  Give an example of a fraction that is less than a half.  Now another example that no one else will think of.  Explain how you know the fraction is less than a half. (draw an image)  Ben put these fractions in order starting with the smallest. Are they in the correct order?  One fifth, one seventh, one sixth | **Spot the mistake**  six tenths, seven tenths, eight tenths, nine tenths, eleven tenths  … and correct it.  **What comes next?**  6/10, 7/10, 8/10, …., ….  12/10, 11/10, …., …., ….  **What do you notice?**  1/10 of 10 = 1 2/10 of 10 = 2 3/10 of 10 = 3  Continue the pattern. What do you notice?  What about 1/10 of 20? Use this to work out 2/10 of 20, etc.  **True or false?**  2/10 of 20cm = 2cm 4/10 of 40cm = 4cm 3/5 of 20cm = 12cm  Give an example of a fraction that is less than a half.  Now another example that no one else will think of.  Explain how you know the fraction is less than a half. (draw an image)  Ben put these fractions in order starting with the smallest. Are they in the correct order?  One fifth, one seventh, one sixth | |
| **Curriculum Links** | Connect fractions to a clock face and to reading the time. It is quarter past 12. What time will it be two- and three-quarter hours later?  Begin to extend their knowledge of the number system to include decimal numbers and fractions they have met so far. Make connections with a range of representations, for example: arrow cards, Dienes, bead string, 100 squares.  Understand the difference between fractions as ordinal numbers (as numbers on a number line), fractions as being a special kind of cardinal number (the answer to 1/2 of a number depends on the quantity you are using) and fractions as operators (What is ½ of 30? What is 2/3 of 45?).  Connect fractions to a range of units of measurement. For example, how many millilitres in ½ a litre? What is ¾ of 2kg?  Connect fractions to division through the concepts of equal sharing and grouping. For example, equal sharing between 2 people results in them having a half each. Equal sharing between four people results in them having a quarter each. OR There are 4 groups of 3 in 12, so 3 must be a quarter of 12 | | |
| **Concept** | **Measurement: time** | | |
| **National Curriculum** | Compare durations of events, for example to calculate the time taken by particular events or tasks  Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o’clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight  Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks  Know the number of seconds in a minute and the number of days in each month, year and leap year | | |
| **White Rose Small Steps** | Months and years  Hours in a day  Telling time to 5 minutes  Telling time to the nearest minute  AM and PM  24-hour clock  Find the duration  Compare the durations  Find start and end times  Measure time in seconds | | |
| **Nrich** | [Wonky Watches](http://nrich.maths.org/public/viewer.php?obj_id=1002) \*\* P  [Watch the Clock](http://nrich.maths.org/public/viewer.php?obj_id=980) \*\*\* P  [Two Clocks](http://nrich.maths.org/public/viewer.php?obj_id=4806) \*\* P  [Clocks](http://nrich.maths.org/public/viewer.php?obj_id=1812) \* P | [The Time Is …](http://nrich.maths.org/7384) \*\* P  [How Many Times?](http://nrich.maths.org/public/viewer.php?obj_id=981) \* I  5 on the Clock \*\*\* I | |
| **Question Bank** | **Working backwards**  Tom’s bus journey takes half an hour. He arrives at his destination at 9:25. At what time did his bus leave?  9:05 8:55 8:45  **Undoing**  A programme lasting 45 minutes finishes at 5.20. At what time did it start?  Draw the clock at the start and finish time.  **Explain thinking**  Salha says that 100 minutes is the same as 1 hour.  Is Salha right? Explain why. | **Working backwards**  Tom’s bus journey takes half an hour. He arrives at his destination at 9:25. At what time did his bus leave?  9:05 8:55 8:45  **The answer is ….**  25 minutes  What is the question?  **What do you notice?**  1 minute = 60 seconds 2 minutes = 120 seconds Continue the pattern  Write down some more time facts like these | |
| **Curriculum Links** | **Addition and subtraction**  Solving problems that involve adding times and finding the differences between them e.g. Sally went to the park at 4 o’clock, she left for home at 5:15. For how long was she at the park? The train left Leicester station at 2:15pm. It took one hour and 55 minutes to arrive in London. At what time did the train arrive in London?  **Fractions**  Showing ¼ past, ½ past and ¼ to the hour on an analogue clock ¼ of an hour is 15 minutes, ½ and hour is 30 minutes, ¾ of an hour is 45 minutes | | |
| **Concept** | **Properties of shape** | | |
| **National Curriculum** | Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them  Recognise angles as a property of shape or a description of a turn  Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle  Identify horizontal and vertical lines and pairs of perpendicular and parallel lines | | |
| **White Rose Small Steps** | Turns and angles  Right angles in shapes  Compare angles  Draw accurately  Horizontal and vertical  Parallel and perpendicular  Recognise and describe 2D shapes  Recognise and describe 3D shapes  Make 3D shapes | | |
| **Nrich** | [Building Blocks](http://nrich.maths.org/public/viewer.php?obj_id=2343) \* P [The Third Dimension](http://nrich.maths.org/public/viewer.php?obj_id=1148) \*\*\* P I  [Rolling That Cube](http://nrich.maths.org/7299) \* P  [Inky Cube](http://nrich.maths.org/7241) \*\*\* P  [Triple Cubes](http://nrich.maths.org/7128) \* I  [Sponge Sections](http://nrich.maths.org/2156) \*\* P  [A Puzzling Cube](http://nrich.maths.org/1140) \* P | | [Arranging Cubes](https://nrich.maths.org/6973) \* G  [Board Block Challenge](https://nrich.maths.org/2872) \*\*\* G  [Square Corners](https://nrich.maths.org/1142) \*\* P  [Stick Images](http://nrich.maths.org/6980) \* G P  [Square It](http://nrich.maths.org/public/viewer.php?obj_id=2526) \* G  [National Flags](http://nrich.maths.org/7749) \* P |
| **Question Bank** | **What’s the same, what’s different?** What is the same and different about these three2-D shapes?    **Visualising**  I am thinking of a 3-dimensional shape which has faces that are triangles and squares. What could my shape be? | | **Other possibilities**  One face of a 3-D shape looks like this.  What could it be?  Are there any other possibilities?  **Convince me**  Which capital letters have perpendicular and / or parallel lines?  Convince me. |
| **Curriculum Links** | **Fractions**  In the guidance for fractions it states that the children should continue to recognise fractions in the context of shape. Give children the opportunity to explore these during shape and fractions lessons in order to reinforce and consolidate their learning in both areas. For example, you could ask the children to draw a variety of regular and irregular shapes and explore which ones can be divided into halves, thirds, quarters etc. It is important that the children consider that equal fractions of a shape have the same area rather than parts that look the same which is often how they are presented in textbooks and worksheets. You could ask the children to cut up pieces of their shapes to find out if they are the same. For example, they could draw the rectangle below and its two diagonals:  The resulting parts don’t all look the same, but each is a quarter. Can the children prove this? They could, for example, cut out each triangle and then cut it in half. These pieces are eighths. Two eighths are equal to a quarter therefore the triangles are all quarters.  You might give the children a tangram like this: | | Ask them to identify each of the shapes (right angled isosceles triangles, parallelogram and square). They then cut the pieces out and explore the fractions that they can make. For example, the small red triangle is half of the parallelogram, the area of square is half that of the green triangle, the red triangle is a quarter of the green triangle.  You could give the children a selection of 3D shapes and ask them to visualise and sketch what they would become if cut in half. For example, a sphere would become a hemisphere, a cube would become a cuboid. They could make triangular prisms out of card or plasticine and explore what these would look like if cut into thirds or quarters. What is the same about them, what is different?  **Measurement**  One of the requirements in measurement is that the children should be taught to measure the perimeter of simple 2D shapes. You could ask the children to draw regular and irregular triangles, rectangles (including squares), pentagons and hexagons. Once they have, they measure their perimeters. Can they find a quick way of finding the perimeter of regular shapes? Can they make up a formula for this? They may be able to come up with l x n, where l = length and n = number of sides. So, for example a pentagon with sides of 4cm would be 4cm x 5 (20cm).  In the guidance for measurement it encourages the comparison of measurements through simple scaling by integers and link this to multiplication. You could ask the children to draw small shapes and then measure their sides to the nearest centimetre. They could then scale these up so that they are, for example, twice the size or five times bigger. They could then draw their shapes again to the new measurements and compare the two. |
| **Concept** | **Mass & capacity** | | |
| **National Curriculum** | Measure, compare, add and subtract: mass (kg/g) and volume/capacity (l/ml) | | |
| **White Rose Small Steps** | Measure mass  Compare mass  Add and subtract mass  Measure capacity  Compare capacity  Add and subtract capacity | | |
| **Nrich** |  | | |
| **Question Bank** | **Top Tips**  Put these measurements in order starting with the largest.  Half a litre, Quarter of a litre, 300 ml Explain your thinking  **Position the symbols**  Place the correct symbol between the measurements > or <  306cm ? Half a metre 930 ml ? 1 litre Explain your thinking | **Write more statements**  (You may choose to consider this practically)  If there are 630ml of water in a jug. How much water do you need to add to end up with a litre of water?  What if there was 450 ml to start with? Make up some more questions like this | |
| **Curriculum Links** | **Addition and subtraction**  Adding/subtracting different lengths, masses or capacities e.g. Sam had two litres of juice in a jug. He poured 750ml into his flask. How much juice was left in the jug?  **Fractions**  A millimetre is ½ a kilogram is 500g, 1/10 of a litre is 100ml | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Independently find an efficient way to solve a range of problems  Independently work systematically  Independently find possibilities using patterns spotted to support  Independently check and improve work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve)*  Pattern spot and predict what will come next in a pattern/sequence *(numbers, shape or spatial)*  Independently investigate conjectures and provide examples and counter-examples  When they have solved a problem, pose a similar problem for a peer | Provide a convinced argument  Reflect on others’ convinced explanations and use this to improve their work  Edit and improve their own and a peer’s convinced explanation  Investigate ‘what if?’ questions  Create ‘what if?’ questions |

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| **Year 3 Summer Term CFC** | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | |
| **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 1** | **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** |
| Count forwards and backwards, in multiples 50, from zero or any other multiple  Count forwards and backwards, in multiples 100, from zero or any other multiple  Count forwards and backwards, in fractions | Count forwards and backwards, in multiples of 4, from zero, or any other multiple, up to 12x4  Count forwards and backwards, in multiples of 8, from zero, or any other multiple, up to 12x8 | Recall multiples of 4, up to 12x4, in any order, including missing numbers and related division facts  Recall multiples of 8, up to 12x8, in any order, including missing numbers and related division facts | Recall multiples of 8, up to 12x8, in any order, including missing numbers and related division facts |  |  | Add numbers with up to three digits, using a formal written method *(column addition)*  Subtract numbers with up to three digits, using a formal written method *(column subtraction)*  Multiply a two-digit number by a one-digit number *(short multiplication)* | |

**Year 4: Long Term Plan**

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| ***Y4*** | **1** | **2** | **3** | | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **TERM 1** | Counting, number & place value | | | | | Addition & subtraction | | | Length & perimeter | Multiplication & division | | | Investigations | | | |
| **TERM 2** | Multiplication & division | | | | Area | Fractions | | | | Decimals | | | Investigations |  | | |
| **TERM 3** | Decimals | | | Money | | Time | Statistics | | Properties of shape | | | Position & direction | Investigations | |  | |

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| **Year 4 Autumn Term Medium Term Planning** | | | | | | | | |
| **Concept** | **Counting, number & place value** | | | | | | | |
| **National Curriculum** | Count backwards through zero to include negative numbers  Count in multiples of 6, 7, 9, 25 and 1 000  Find 1 000 more or less than a given number  Order and compare numbers beyond 1 000  Identify, represent and estimate numbers using different representations  Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value  Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)  Round any number to the nearest 10, 100 or 1 000  Solve number and practical problems that involve all the above and with increasingly large positive numbers | | | | | | | |
| **White Rose Small Steps** | Roman Numerals to 100  Round to the nearest 10  Round to the nearest 100  Count in 1,000s  1,000s, 100s, 10s and 1s  Partitioning  Number line to 10,000  1,000 more or less  Compare numbers  Order numbers  Round to the nearest 1,000  Count in 25s  Negative numbers | | | | | | | |
| **Nrich** | [Some Games That May Be Nice or Nasty](http://nrich.maths.org/6605) \* G  [The Deca Tree](http://nrich.maths.org/public/viewer.php?obj_id=2006) \* P | | | | | | | |
| **Question Bank** | **Spot the mistake**:  950, 975,1000,1250 What is wrong with this sequence of numbers?  **True or False?**  324 is a multiple of 9?  **What comes next?**  6706+ 1000= 7706, 7706 + 1000 = 8706, 8706 + 1000 = 9706  **Do, then explain**  5035 5053 5350 5530 5503  If you wrote these numbers in order starting with the largest, which number would be third?  Explain how you ordered the numbers.  **Missing symbol**  Put the correct symbol < or > in each box  3.03 3.33  0.37 0.32  What needs to be added to 3.23 to give 3.53?  What needs to be added to 3.16 to give 3.2? | | | | | **Do, then explain**  Show the value of the digit 4 in these numbers?  3041 4321 5497 Explain how you know.  **Make up an example** Create four-digit numbers where the digit sum is four and the tens digit is one.  E.g. 1210, 2110, 3010 What is the largest/smallest number?  **Possible answers**  A number rounded to the nearest ten is 540. What is the smallest possible number it could be?  **What do you notice?**  Round 296 to the nearest 10. Round it to the nearest 100. What do you notice? Can you suggest other numbers like this?  **Do, then explain**  Circle each decimal which when rounded to the nearest whole number is 5.  5.3 5.7 5.2 5.8 Explain your reasoning  **Top tips**  Explain how to round numbers to one decimal place? | | |
| **Curriculum Links** | Number and place value skills are applied in many other areas of the mathematics curriculum. Knowledge of four-digit numbers and decimal numbers links to work in addition and subtraction.  Place value is also essential when estimating and using inverse operations to check answers to calculations.  Counting in multiples of 6, 7 and 9 links to the recall of multiplication and division facts for multiplication tables up to 12 × 12. Other mental multiplication and division work relies heavily on sound place value and number knowledge.  Knowledge of number and place value permeates many different aspects of everyday life. The introduction of Roman Numerals in Year 4 can be developed alongside knowledge of other number systems throughout history. Common sources will be clocks, page numbers in books, production dates on TV programmes and films. | | | | | The use of ‘Zero’ within telephone numbers and the start of the Dewey Decimal library referencing system can be explored in the classroom. Negative numbers can be introduced through the contexts of temperature, or bank accounts in the ‘red’.  When counting in multiples, try to link to ‘everyday’ items such multiples of six eggs, multiples of 6 players in a six-a-side football team, 9 players in a baseball team.  Numbers 1000 or more as dates and money.  When teaching rounding or estimating, the context of numbers of people in an audience or crowd could be used. | | |
| **Concept** | **Addition & subtraction** | | | | | | | |
| **National Curriculum** | Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate  Estimate and use inverse operations to check answers to a calculation  Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why | | | | | | | |
| **White Rose Small Steps** | Add and subtract 1s, 10s, 100s and 1,000s  Add two 4-digit numbers – no exchange  Add two 4-digit numbers – one exchange  Add two 4-digit numbers – more than one exchange  Subtract two 4-dgit numbers – no exchange  Subtract two 4-digit numbers – one exchange  Subtract two 4-digit numbers – more than one exchange  Efficient subtraction  Estimate answers  Checking strategies | | | | | | | |
| **Nrich** | [The Puzzling Sweet Shop](http://nrich.maths.org/public/viewer.php?obj_id=223) \*\* P  [Money Bags](http://nrich.maths.org/public/viewer.php?obj_id=1116) \*\* P  [Amy’s Dominoes](http://nrich.maths.org/public/viewer.php?obj_id=1044) \*\* P  [Escape from the Castle](http://nrich.maths.org/7501) \*\* P | | | | [Fifteen Cards](http://nrich.maths.org/7506) \* P I  [Sealed Solution](http://nrich.maths.org/public/viewer.php?obj_id=1177) \*\* P  [Roll These Dice](http://nrich.maths.org/53) \*\* I | | | |
| **Question Bank** | **True or false?**  Are these number sentences true or false?6.7 + 0.4 = 6.11  8.1 – 0.9 = 7.2  Give your reasons.  **Hard and easy questions**  Which questions are easy / hard?  13323 - 70 =  12893 + 300 =  19354 - 500 =  19954 + 100 =  Explain why you think the hard questions are hard? | | | | **Making an estimate**  Which of these number sentences have the answer that is between 550 and 600?  1174 - 611  3330 – 2779  9326 – 8777  **Always, sometimes, never**  Is it always sometimes or never true that the difference between two odd numbers is odd?  **Convince me**  - 666 = 8 5  What is the largest possible number that will go in the rectangular box?  What is the smallest?  Convince me | | | |
| **Curriculum Links** | Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres  Estimate, compare and calculate different measures, including money in pounds and pence  When shopping, children will be required to find totals, calculate change and estimate costs in pounds and pence.  Planning a budget for various projects will involve a great deal of calculation  Practical tasks such as designing models and packaging and calculating perimeters for fencing and borders will all involve addition and subtraction skills. | | | | | | | |
| **Concept** | **Length & perimeter** | | | | | | | |
| **National Curriculum** | Estimate, compare and calculate **different measures**  Measure and calculate the **perimeter** of a rectilinear figure (including squares) in centimetres and metres  Convert between different units of measure (e.g. kilometre to metre) | | | | | | | |
| **White Rose Small Steps** | Kilometres  Perimeter on a grid  Perimeter of a rectangle  Perimeter of rectilinear shapes | | | | | | | |
| **Nrich** | Torn Shapes \* P I  [Discuss and Choose](http://nrich.maths.org/7449) \* P | | | | | | | |
| **Question Bank** | **Testing conditions**  If the width of a rectangle is 3 metres less than the length and the perimeter is between 20 and 30 metres, what could the dimensions of the rectangle lobe?  Convince me.  **Undoing**  If the longer length of a rectangle is 13cm and the perimeter is 36cm, what is the length of the shorter side?  Explain how you got your answer. | | | | **Always, sometimes, never**  If you double the area of a rectangle, you double the perimeter.  **The answer is ….**  225 metres  What is the question? | | | |
| **Curriculum Links** | **Number and place value**  If converting, for example, 1.5km to metres they need to know that 1km is 1000m and that 0.5km is half of 1000m in order to give an answer of 1500m.  When solving problems involving measures or carrying out practical activities, it would be helpful to give the children opportunities to order different lengths, masses, capacities and volumes and also to round amounts to the nearest whole unit, ten, hundred etc. For example, you could ask the children to pick four cards and make a 4-digit number. They pretend their number represents grams and write them in as many different ways as they can, for example 4563 grams, 4kg 563g, 4.563kg. You could then ask them to round the grams to the nearest 10 (4560g), 100 (4600g) and 1000 (5000g). They could repeat this with metres and millilitres. | | **Addition and subtraction**  Freddie had a length of string which was 1m 75cm. He cut off two pieces, one 28cm and another 75cm and gave them to a friend. How much string did he have left?  They should be encouraged to decide which operations and methods to use and why.  **Multiplication and division**  2km would be multiplied by 1000 to give 2000m. When converting from smaller to larger units division would be involved, for example, 200ml divided by 1000 would be 0.2l.  When looking at perimeter the children need to explore the algebraic formula of 2(a + b) where a and b are the dimensions in the same unit. This involves doubling or multiplying by two.  The notes and guidance suggests that the children study area through arrays of squares and discover for themselves that areas can be found by multiplying the number of rows by the number of columns which is the same as the length multiplied by the width. | | | | Provide the children with opportunities to solve problems which involve multiplication and division. For example:  Hammed wants to cover his back yard with grass. His back-yard measures 12m by 10m. What area will he cover?  Ahmed is going to sow grass seed in his garden. It is a rectangular measuring 8m by 4.5m. He needs to know the perimeter and area so he can buy the grass seed and bricks for the wall he wants to build around it. What are the perimeter and area of his garden?  **Fractions**  You could encourage the children to explore simple fractions of measurement such as ½, ¼ and ¾ of different numbers of centimetres, metres, kilometres, litres and kilograms. They could also do this for hours, perimeters and areas. This would reinforce the concept of finding a fraction by division. | |
| **Concept** | **Multiplication & division** | | | | | | | |
| **National Curriculum** | Count in multiples of 6, 7, 9, 25 and 1 000  Recall multiplication and division facts for multiplication tables up to 12 × 12  Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers  Recognise and use factor pairs and commutativity in mental calculations  Multiply two-digit and three-digit numbers by a one-digit number using formal written layout  Recognise and use factor pairs and commutativity in mental calculations  Estimate and use inverse operations to check answers to a calculation  Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects | | | | | | | |
| **White Rose Small Steps** | Multiply by 10  Multiply by 100  Divide by 10  Divide by 100  Multiply by 1 and 0  Divide by 1  Multiply and divide by 6  6 times table and division facts  Multiply and divide by 9  9 times table and division facts  Multiply and divide by 7  7 times table and division facts | | | | | | | |
| **Nrich** | [Trebling](http://nrich.maths.org/public/viewer.php?obj_id=2004) \* P  All the Digits \*\* P  [Multiplication Square Jigsaw](http://nrich.maths.org/public/viewer.php?obj_id=5573) \* G P  [Shape Times Shape](http://nrich.maths.org/public/viewer.php?obj_id=5714) \* P  [Table Patterns Go Wild!](http://nrich.maths.org/6924) \*\* I  [Let’s Divide Up!](http://nrich.maths.org/8308) \* P | | | [That Number Square!](http://nrich.maths.org/8169) \* I  [Carrying Cards](http://nrich.maths.org/2726) \* P  [Light the Lights Again](http://nrich.maths.org/7035) \* GP  [Multiples Grid](http://nrich.maths.org/public/viewer.php?obj_id=5429) \* I  [Zios and Zepts](http://nrich.maths.org/1005) \* P  Times Tables Shifts \* G P | | | | |
| **Question Bank** | **Missing numbers**  72 = x  Which pairs of numbers could be written in the boxes?  **Making links** Eggs are bought in boxes of 12. I need 140 eggs; how many boxes will I need to buy?  **Use a fact**  63 ÷ 9 = 7 Use this fact to work out 126 ÷ 9 = 252 ÷ 7 =  **Making links**  How can you use factor pairs to solve this calculation?  13 x 12 (13 x 3 x 4, 13 x 3 x 2 x 2, 13 x 2 x 6)  **Always, sometimes, never?** | Is it always, sometimes or never true that an even number that is divisible by 3 is also divisible by 6?  Is it always, sometimes or never true that the sum of four even numbers is divisible by 4?  **What do you notice?**  1/10 of 100 = 10 1/100 of 100 = 1 2/10 of 100 = 20 2/100 of 100 = 2 How can you use this to work out 6/10 of 200? 6/100 of 200?  **True or false?**  1/20 of a metre= 20cm 4/100 of 2 metres = 40cm  **Undoing**  I divide a number by 100 and the answer is 0.3. What number did I start with?  **Another and another**  Write down a number with one decimal place which when multiplied by 10 gives an answer between 120 and 130. ... and another, … and another, … | | | **Use the inverse**  Use the inverse to check if the following calculations are correct:  23 x 4 = 92  117 ÷ 9 = 14  **Size of an answer**  Will the answer to the following calculations be greater or less than 300?  152 x 2= 78 x 3 = 87 x 3 = 4 x 74 = **Prove It**  What goes in the missing box?  6 x 4 = 512  Prove it. | | | **How close can you get?**  X 7  Using the digits 3, 4 and 6 in the calculation above how close can you get to 4500? What is the largest product? What is the smallest product  **Connected Calculations**  Put the numbers 7.2, 8, 0.9 in the boxes to make the number sentences correct.  = x  = ÷ |
| **Curriculum Links** | **Measurement and Fractions**  Learners will encounter multiplication and division in:  Counting – Calculating totals by counting small amounts or a proportion and then scaling up e.g. standing against a tree and using your known height to work out ‘How many of me are equal to the height of the tree?’ or counting people on one part of a stadium and multiplying to calculate the total number of spectators. | | | Money – shopping: adding multiple products of the same price, adding coins of same value, working out fraction/percentage discounts and special offers, sharing bills.  Measurement – Scaling quantities (e.g. recipes) to cater for more and less people, reading scales and unlabelled increments on measuring apparatus, calculating area for carpets, decorating etc., scaling shapes to scale geometric artwork e.g. How would you make this triangle three times its size/half its size? Comparing river lengths/building heights e.g. the River Nile is x times longer than the River X. The height of Snowdon is (fraction) of the height of Everest.  Statistics – Reading scales and determining appropriate scales for different types of graph relating to weather, temperature, sound etc., Working with proportion, fractions and percentages using pie charts, comparing data using ratio, fractions and scaling such as proportion of children missing breakfast or 1 in 7 children under 10 now has a mobile phone etc. | | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Make suggestions of ways to solve a range of problems  Develop and apply a systematic approach  Find and predict possibilities that match the context using patterns spotted to support  Independently check and improve work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve)*  Pattern spot and with support, express generalisations/rules in words  Make and investigate conjectures and provide examples and counter-examples  When they have solved a problem, pose a similar problem for a peer | Provide a clear, correct, logical justification and with support, express generalisation/rules formed in words  Reflect on others’ justifications and use this to improve their work  Edit and improve their own and a peer’s justification  Investigate ‘what if?’ questions.  Create ‘what if?’ questions |

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| **Year 4 Autumn Term CFC** | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | |
| **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** |
| Count backwards through zero to include negative numbers  Count forwards and backwards, in multiples 25, from zero or any other multiple  Count forwards and backwards, in multiples 1000, from zero or any other multiple  Count forwards and backwards, in multiples of 6, from zero, or any other multiple, up to 12x6, | Count forwards and backwards, in multiples of 7, from zero, or any other multiple, up to 12x7 | Recall ‘1, 10 , 100 and 1000 more’ facts, with numbers up to 4-digits  Recall ‘1, 10 , 100 and 1000 less facts, with numbers up to 4-digits  Recall multiples of 3, up to 12x3, in any order, including missing numbers and related division facts  Recall multiples of 4, up to 12x4, in any order, including missing numbers and related division facts  Recall multiples of 8, up to 12x8, in any order, including missing numbers and related division facts  Derive and recall addition facts, within 1000, using bonds to 10 to support *(327+23, 452+154)*  Derive and recall sums of multiples of 10, 100 or 1000 *(650+230)*  Derive and recall differences of multiples of 10, 100 or 1000 *(960-390)*  Derive and recall addition doubles of all numbers from 1 to 100 , up to a total of 200 *(63+63, 67+67 (bridging))*  Derive and recall addition doubles for multiples of 10, within 1000  Derive and recall addition doubles for multiples of 100, up to a total of 2000  Derive and recall addition doubles for multiples of 1000  Derive and recall what must be added to any four-digit number to make the next multiple of 1000  *(4087+?=5000)* | Recall multiples of 6, up to 12x3, in any order, including missing numbers and related division facts  Derive and recall doubles of all numbers from 1 to 100 and the corresponding halves  Derive and recall doubles of any multiple of 10 and 100 and the corresponding halves *(double 340, halve 680)*  Halve any even number to 200 *(halve 186)*  Multiply by 1 and 0  Divide by 1 | Add near addition doubles of multiples of 10, with a difference of 20 *(partition, double and adjust)*  Add a near multiple of 100 *(140+150)*  Subtract a near multiple of 100 *(390-370)*  Add a near multiple of 10 or 100 to any two-digit or three-digit number *(235+198)*  Subtract a near multiple of 10 or 100 from any two-digit or three-digit number *(535-198)*  Add a pair of two-digit numbers or three-digit multiples of 10 *(38+86, 350+360)*  Subtract a pair of two-digit numbers or three-digit multiples of 10 *(86+-39, 390-360)* | Multiply numbers, up to 20, by a one-digit number  Multiply a multiple of 10, up to 100, by a one-digit number *(90x6)*  Multiple a one-digit by 100  Multiple a two-digit by 100  Multiply a three-digit by 10  Multiply a three-digit by 100  Divide numbers by 10 *(whole number answers)*  Divide numbers by 100 *(whole number answers)*  Multiply by 6, 7 & 9  Divide by 6, 7 & 9  Find the remainder after dividing a two-digit number by a one-digit number  Multiply two-digit numbers by 4, using doubles *(26x4=double 26, double 52)*  Divide two-digit numbers by 4, using doubles  *(96÷4=halve 96, halve 48)*  Multiply two-digit numbers by 5, using x10 and halve  *(32x5 = (32x10)÷2 or (32÷2)x10)*  Multiply two-digit numbers by 20, using x10 and double  *(32x20 = (32x10)x2*  *or (32x2) x 10)* | Add numbers with up to 4 digits using a formal written method *(column addition)*  Subtract numbers with up to 4 digits using a formal written method *(column subtraction)* | |

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| **Year 4 Spring Term Medium Term Planning** | | | | | |
| **Concept** | **Multiplication & division** | | | | |
| **National Curriculum** | Recall and use multiplication and division facts for multiplication tables up to 12 × 12  Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers  Recognise and use factor pairs and commutativity in mental calculations  Multiply two digit and three-digit numbers by a one-digit number using formal written layout  Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects | | | | |
| **White Rose Small Steps** | 11 and 12 times-table  Multiply 3 numbers  Factor pairs  Efficient multiplication  Written methods  Multiply 2-digits by 1-digit  Multiply 3-digits by 1-digit  Divide 2-digits by 1-digit (1)  Divide 2-digits by 1-digit (2)  Divide 3-digits by 1-digit  Correspondence problems | | | | |
| **Nrich** | [Multiplication Square Jigsaw](http://nrich.maths.org/public/viewer.php?obj_id=5573) \* G P  [Shape Times Shape](http://nrich.maths.org/public/viewer.php?obj_id=5714) \* P  [Table Patterns Go Wild!](http://nrich.maths.org/6924) \*\* I  [Let’s Divide Up!](http://nrich.maths.org/8308) \* P  [That Number Square!](http://nrich.maths.org/8169) \* I  [Carrying Cards](http://nrich.maths.org/2726) \* P | | [Light the Lights Again](http://nrich.maths.org/7035) \* GP  [Multiples Grid](http://nrich.maths.org/public/viewer.php?obj_id=5429) \* I  [Zios and Zepts](http://nrich.maths.org/1005) \* P  Times Tables Shifts \* G P  [Trebling](http://nrich.maths.org/public/viewer.php?obj_id=2004) \* P  All the Digits \*\* P | | |
| **Question Bank** | **Missing numbers**  72 = x  Which pairs of numbers could be written in the boxes?  **Making links** Eggs are bought in boxes of 12. I need 140 eggs; how many boxes will I need to buy?  **Use a fact**  63 ÷ 9 = 7 Use this fact to work out 126 ÷ 9 = 252 ÷ 7 =  **Making links**  How can you use factor pairs to solve this calculation?  13 x 12 (13 x 3 x 4, 13 x 3 x 2 x 2, 13 x 2 x 6)  **Always, sometimes, never?**  Is it always, sometimes or never true that an even number that is divisible by 3 is also divisible by 6?  Is it always, sometimes or never true that the sum of four even numbers is divisible by 4? | **What do you notice?**  1/10 of 100 = 10 1/100 of 100 = 1 2/10 of 100 = 20 2/100 of 100 = 2  How can you use this to work out 6/10 of 200? 6/100 of 200?  **True or false?**  1/20 of a metre= 20cm 4/100 of 2 metres = 40cm  **Undoing**  I divide a number by 100 and the answer is 0.3. What number did I start with?  **Another and another**  Write down a number with one decimal place which when multiplied by 10 gives an answer between 120 and 130. ... and another, … and another, …  **Use the inverse**  Use the inverse to check if the following calculations are correct:  23 x 4 = 92  117 ÷ 9 = 14 | | | **Size of an answer**  Will the answer to the following calculations be greater or less than 300?  152 x 2=  78 x 3 =  87 x 3 =  4 x 74 =  **Prove It**  What goes in the missing box?  6 x 4 = 512  Prove it.  **How close can you get?**  X 7  Using the digits 3, 4 and 6 in the calculation above how close can you get to 4500? What is the largest product? What is the smallest product? |
| **Curriculum Links** | Measurement  Fractions  Counting – Calculating totals by counting small amounts or a proportion and then scaling up e.g. standing against a tree and using your known height to work out ‘How many of me are equal to the height of the tree?’ or counting people on one part of a stadium and multiplying to calculate the total number of spectators. | | Money – shopping: adding multiple products of the same price, adding coins of same value, working out fraction/percentage discounts and special offers, sharing bills.  Measurement – Scaling quantities (e.g. recipes) to cater for more and less people, reading scales and unlabelled increments on measuring apparatus, calculating area for carpets, decorating etc., scaling shapes to scale geometric artwork e.g. How would you make this triangle three times its size/half its size? Comparing river lengths/building heights e.g. the River Nile is x times longer than the River X. The height of Snowdon is (fraction) of the height of Everest.  Statistics – Reading scales and determining appropriate scales for different types of graph relating to weather, temperature, sound etc., Working with proportion, fractions and percentages using pie charts, comparing data using ratio, fractions and scaling such as proportion of children missing breakfast or 1 in 7 children under 10 now has a mobile phone etc. | | |
| **Concept** | **Area** | | | | | |
| **National Curriculum** | Find the area of rectilinear shapes by counting squares. | | | | | |
| **White Rose Small Steps** | What is area?  Counting squares  Making shapes  Comparing area | | | | | |
| **Nrich** | **Torn Shapes \* P I** | | | | | |
| **Question Bank** | **Testing conditions**  If the width of a rectangle is 3 metres less than the length and the perimeter is between 20 and 30 metres, what could the dimensions of the rectangle lobe?  Convince me.  **Always, sometimes, never**  If you double the area of a rectangle, you double the perimeter. | | | | | |
| **Curriculum Links** | Provide the children with opportunities to solve problems which involve multiplication and division. For example:   * Hammed wants to cover his back yard with grass. His back-yard measures 12m by 10m. What area will he cover? * Ahmed is going to sow grass seed in his garden. It is a rectangular measuring 8m by 4.5m. He needs to know the perimeter and area so he can buy the grass seed and bricks for the wall he wants to build around it. What are the perimeter and area of his garden? | | | | | |
| **Concept** | **Fractions** | | | | | |
| **National Curriculum** | Recognise and show, using diagrams, families of common equivalent fractions.  Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.  Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number.  Add and subtract fractions with the same denominator | | | | | |
| **White Rose Small Steps** | What is a fraction?  Equivalent fractions (1)  Equivalent fractions (2)  Fractions greater than 1  Count in fractions  Add 2 or more fractions  Subtract 2 fractions  Subtract from whole amounts  Calculate fractions of a quantity  Problem solving – calculate quantities | | | | | |
| **Nrich** | [Fractional Triangles](http://nrich.maths.org/public/viewer.php?obj_id=2124) \* P  [Bryony’s Triangle](http://nrich.maths.org/7392) \* P  [Fair Feast](http://nrich.maths.org/public/viewer.php?obj_id=2361) \* P  [Fractions in a Box](http://nrich.maths.org/public/viewer.php?obj_id=1103) \*\* P  [Chocolate](http://nrich.maths.org/public/viewer.php?obj_id=34) \*\* P I | | | | | |
| **Question Bank** | **Spot the mistake**  sixty tenths, seventy tenths, eighty tenths, ninety tenths, twenty tenths  … and correct it.  **What comes next?**  83/100, 82/100, 81/100, …., …., ….  31/100, 41/100, 51/100, …., ….,  **Odd one out.**  Which is the odd one out in each of these trio  s¾ 9/12 4/6 9/12 10/15 2/3 Why?  **What do you notice?**  Find 4/6 of 24 Find 2/3 of 24 What do you notice? Can you write any other similar statements?  **Complete the pattern by filling in the blank cells in this table:**   |  |  |  |  | | --- | --- | --- | --- | | 1  10 | 2  10 | 3  10 |  | | 10  100 | 20  100 |  | 40  100 | | 0.1 |  | 0.3 |  |   **Ordering**  Put these numbers in the correct order, starting with the smallest.  ¼ 0.75 5/10 Explain your thinking  **What do you notice?**  5/5 – 1/5 = 4/5 4/5 – 1/5 = 3/5  **Continue the pattern**  Can you make up a similar pattern for addition?  The answer is 3/5, what is the question?  **What do you notice?**  11/100 + 89/100 = 1 12/100 + 88/100 = 1 13/100 + 87/100 = 1  Continue the pattern for the next five number sentences | | | | | |
| **Curriculum Links** | Measurements – Children can be asked to find the position 1⁄10 along a metre stick. Where would ¾ be? How many centimetres along the stick is that?  Reading scales – When using a tape measure, kitchen scales, a measuring jug. They may be asked to find 1⁄10 of a metre, a kilogram, a litre.  Exploring fractions in everyday contexts – how many square pieces make half of this chocolate bar?  Data handling – which flavour crisps did ¼ of the children like best?  [**The National Gallery of Art website**](http://www.nga.gov/content/ngaweb/education/teachers/lessons-activities/counting-art/thiebaud-elem.html) provides a wonderful resource based on Thiebaud’s ‘Cakes’ picture, and provides some wonderful starting points for fractions work in mathematics. | | | | | |
| **Concept** | **Decimals** | | | | |
| **National Curriculum** | Recognise and write decimal equivalents of any number of tenths or hundredths.  Find the effect of dividing a one- or two-digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths  Solve simple measure and money problems involving fractions and decimals to two decimal places.  Convert between different units of measure [for example, kilometre to metre] | | | | |
| **White Rose Small Steps** | Recognise tenths and hundredths  Tenths as decimals  Tenths on a place value grid  Tenths on a number line  Divide 1-digit by 10  Divide 2-digits by 10  Hundredths  Hundredths as decimals  Hundredths on a place value grid  Divide 1 or 2-digits by 100 | | | | |
| **Nrich** |  | | | | |
| **Question Bank** | **Complete the pattern by filling in the blank cells in this table:**   |  |  |  |  | | --- | --- | --- | --- | | 1  10 | 2  10 | 3  10 |  | | 10  100 | 20  100 |  | 40  100 | | 0.1 |  | 0.3 |  | | | | **Another and another**  Write a decimal numbers (to one decimal place) which lies between a half and three quarters? … and another, … and another, …  **Ordering**  Put these numbers in the correct order, starting with the smallest.  ¼ 0.75 5/10  Explain your thinking | |
| **Curriculum Links** | Measurements – Children can be asked to find the position 1⁄10 along a metre stick. Where would ¾ be? How many centimetres along the stick is that?  Reading scales – When using a tape measure, kitchen scales, a measuring jug. They may be asked to find 1⁄10 of a metre, a kilogram, a litre.  Exploring fractions in everyday contexts – how many square pieces make half of this chocolate bar?  Data handling – which flavour crisps did ¼ of the children like best?  [**The National Gallery of Art website**](http://www.nga.gov/content/ngaweb/education/teachers/lessons-activities/counting-art/thiebaud-elem.html) provides a wonderful resource based on Thiebaud’s ‘Cakes’ picture and provides some wonderful starting points for fractions work in mathematics. | | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Make suggestions of ways to solve a range of problems  Develop and apply a systematic approach  Find and predict possibilities that match the context using patterns spotted to support  Independently check and improve work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve)*  Pattern spot and with support, express generalisations/rules in words  Make and investigate conjectures and provide examples and counter-examples  When they have solved a problem, pose a similar problem for a peer | Provide a clear, correct, logical justification and with support, express generalisation/rules formed in words  Reflect on others’ justifications and use this to improve their work  Edit and improve their own and a peer’s justification  Investigate ‘what if?’ questions.  Create ‘what if?’ questions |

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| **Year 4 Spring Term CFC** | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | |
| **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** |
| Count forwards and backwards, in multiples of 9, from zero, or any other multiple, up to 12x9  Count forwards and backwards, in multiples of 11, from zero or any other multiple, up to 12x11 | Count forwards and backwards, in fractions  Count up and down in tenths and hundredths | Recall multiples of 6, up to 12x3, in any order, including missing numbers and related division facts  Recall multiples of 7, up to 12x3, in any order, including missing numbers and related division facts  Derive and recall doubles of all numbers from 1 to 100 and the corresponding halves  Derive and recall doubles of any multiple of 10 and 100 and the corresponding halves  *(double 340, halve 680)*  Halve any even number to 200 *(Halve 186)* | Recall multiples of 7, up to 12x3, in any order, including missing numbers and related division facts | Multiply 3 numbers  Derive and recall factor pairs for known table facts *(20 (1x20, 2x10, 4x5))*  Divide a two-digit by a one-digit  Multiply by 11 & 12  Divide by 11 & 12 | Divide a one-digit by 10 *(1.d.p)*  Divide a two-digit by 10 *(1.d.p)*  Divide a one-digit by 100 *(2.d.p.)*  Divide a two-digit by 100 *(2.d.p.)* | Multiply a two-digit number by a one-digit number using a formal written layout *(short multiplication)*  Multiply a three-digit number by a one-digit number using a formal written layout *(short multiplication)* | Add decimals up to 2.d.p., using a formal written method *(column addition)*  Subtract decimals up to 2.d.p., using a formal written method *(column subtraction)* |

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| **Year 4 Summer Term Medium Term Planning** | | | |
| **Concept** | **Decimals** | | |
| **National Curriculum** | Compare numbers with the same number of decimal places up to two decimal places  Round decimals with one decimal place to the nearest whole number  Recognise and write decimal equivalents to ¼, ½ and ¾  Find the effect of dividing a one- or two-digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths | | |
| **White Rose Small Steps** | Make a whole  Write decimals  Compare decimals  Order decimals  Round decimals  Halves and quarters | | |
| **Nrich** |  | | |
| **Question Bank** | **Complete the pattern by filling in the blank cells in this table:**   |  |  |  |  | | --- | --- | --- | --- | | 1  10 | 2  10 | 3  10 |  | | 10  100 | 20  100 |  | 40  100 | | 0.1 |  | 0.3 |  | | | **Another and another**  Write a decimal numbers (to one decimal place) which lies between a half and three quarters? … and another, … and another, …  **Ordering**  Put these numbers in the correct order, starting with the smallest.  ¼ 0.75 5/10  Explain your thinking |
| **Curriculum Links** | Measurements – Children can be asked to find the position 1⁄10 along a metre stick. Where would ¾ be? How many centimetres along the stick is that?  Reading scales – When using a tape measure, kitchen scales, a measuring jug. They may be asked to find 1⁄10 of a metre, a kilogram, a litre.  Exploring fractions in everyday contexts – how many square pieces make half of this chocolate bar?  Data handling – which flavour crisps did ¼ of the children like best?  [**The National Gallery of Art website**](http://www.nga.gov/content/ngaweb/education/teachers/lessons-activities/counting-art/thiebaud-elem.html) provides a wonderful resource based on Thiebaud’s ‘Cakes’ picture and provides some wonderful starting points for fractions work in mathematics. | | |
| **Concept** | **Measurement: money** | | |
| **National Curriculum** | Estimate, compare and calculate different measures, including money in pounds and pence  Solve simple measure and money problems involving fractions and decimals to two decimal places | | |
| **White Rose Small Steps** | Pounds and pence  Order money  Round to estimate money  Four operations with money | | |
| **Nrich** | [Discuss and Choose](http://nrich.maths.org/7449) \* P | | |
| **Question Bank** | **Position the symbols**  Place the correct symbols between the measurements > or <  £23.61 2326p 2623p Explain your thinking | | |
| **Curriculum Links** | **Addition and subtraction**  Amy had saved £575. She bought laptop for £245.50 and a printer for £125. How much of her saving did she have left?  They should be encouraged to decide which operations and methods to use and why.  Within the history curriculum, see, for example:  **The history of our money** | | |
| **Concept** | **Measurement: time** | | |
| **National Curriculum** | Convert between different units of measure [for example, kilometre to metre; hour to minute]  Read, write and convert time between analogue and digital 12- and 24-hour clocks  Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days | | |
| **White Rose Small Steps** | Hours, minutes and seconds  Years, months, weeks and days  Analogue to digital – 12 hour  Analogue to digital – 24 hour | | |
| **Nrich** | [Discuss and Choose](http://nrich.maths.org/7449) \* P | | |
| **Question Bank** | **Undoing**  Imran’s swimming lesson lasts 50 mins. and it takes 15 mins. to change and get ready for the lesson. What time does Imran need to arrive if his lesson finishes at 6.15pm?  **Explain thinking**  The time is 10:35 am.  Jack says that the time is closer to 11:00am than to 10:00am.  Is Jack, right? Explain why | **Working backwards**  Put these times of the day in order, starting with the earliest time.  A: Quarter to four in the afternoon B: 07:56 C: six minutes to nine in the evening D: 14:36  **What do you notice?**  What do you notice?  1:00pm = 13:00 2:00pm = 14:00  Continue the pattern | |
| **Curriculum Links** | **Addition and subtraction**  Mandy left home at 10:30am. She arrived at the shopping centre 40 minutes later. What time did she get to the shopping centre?  The film started at 17:45. Bobby was 35 minutes early. At what time did he arrive at the cinema?  They should be encouraged to decide which operations and methods to use and why.  Within the science curriculum there are opportunities to connect with measurement, for example, one of the requirements for *states of matter* is that the children should be taught to identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. This could involve measuring temperatures using a thermometer and tracking the changes over, for example, a morning. The children record the temperature every 40 minutes making a note of the time in 24-hour digital format. | Within the design and technology curriculum there will be plenty of opportunities for accurate measuring, particularly of length using different units in the designing and making stages.  Within the cooking and nutrition curriculum the children should be taught to prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. As they work on these practically they will need to measure mass and volume. You could provide them with recipes and ask them to scale them up or down for different numbers of people and then to measure out the correct ingredients. If they require cooking time, the children could make up timetables to show preparation, cooking and clearing up times using 12- or 24-hour digital formats.  Within the history curriculum, see, for example:  [**The history of time**](https://www.ncetm.org.uk/resources/18012)  In real life, measurement is something that we frequently do without even thinking about it. You could ask the children to think about what they have done from waking up in the morning that has involved measuring. They might think of ideas to do with length (distance walking into school), mass (weight of their back pack),capacity and volume (filling their flask with juice), time (leaving home to get to school on time) | |
| **Concept** | **Statistics** | | |
| **National Curriculum** | Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs  Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs | | |
| **White Rose Small Steps** | Interpret charts (discrete)  Comparison, sum and difference  Introduce line graphs  Line graphs | | |
| **Nrich** | [Venn Diagrams](http://nrich.maths.org/public/viewer.php?obj_id=6290) \* P  [More Carroll Diagrams](http://nrich.maths.org/public/viewer.php?obj_id=5729) \* P  Plants \*\* I | | |
| **Question Bank** | **True or false?** (Looking at a graph showing how the class sunflower is growing over time) “Our sunflower grew the fastest in July”.  **Is this true or false?**  **Convince me.**  Make up your own ‘true/false’ statement about the graph. | **What’s the same, what’s different?**  Pupils identify similarities and differences between different representations and explain them to each other  **Create a questions** Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives. | |
| **Curriculum Links** | **Addition and subtraction**  The requirements for statistics include solving comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. Clearly, solving such problems requires the ability to add and subtract. When covering these concepts, you could provide the children with copies of bar charts, pictograms, tables and other graphs and ask them to then make up and solve problems involving addition and subtraction.  **Multiplication and division**  You could ask the children to create bar graphs and pictograms with scales going up in step sizes that will help them to practice recalling these facts. | Within the science curriculum there are opportunities to connect with statistics, for example, in working scientifically there is a requirement that the children record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. In the section on living things they should identify and name a variety of living things (plants and animals) in the local and wider environment, using classification keys to assign them to groups. This can be done using tables or Venn and Carroll diagrams.  physical geography, including: climate zones, biomes and vegetation belts, rivers, mountains, volcanoes and earthquakes, and the water cycle  human geography, including: types of settlement and land use, economic activity including trade links, and the distribution of natural resources including energy, food, minerals and water  Give the children opportunities to gather relevant data and present it in tables, bar charts or pictograms and then analyse their findings. | |
| **Concept** | **Geometry: properties of shapes** | | |
| **National Curriculum** | Identify acute and obtuse angles and compare and order angles up to two right angles by size  Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes  Identify lines of symmetry in 2-D shapes presented in different orientations  Complete a simple symmetric figure with respect to a specific line of symmetry | | |
| **White Rose Small Steps** | Identify angles  Compare and order angles  Triangles  Quadrilaterals  Lines of symmetry  Complete a symmetric figure | | |
| **Nrich** | [Let’s Reflect](http://nrich.maths.org/public/viewer.php?obj_id=1873) \* P  [National Flags](http://nrich.maths.org/7749) \* P  [Stringy Quads](http://nrich.maths.org/public/viewer.php?obj_id=2913) \*\* P  [Bracelets](https://nrich.maths.org/79) \* I  [Counters in the Middle](https://nrich.maths.org/6978) \* G P  [Nine-pin Triangles](http://nrich.maths.org/public/viewer.php?obj_id=2852) \*\*\* I  [Cut it Out](http://nrich.maths.org/public/viewer.php?obj_id=720) \*\*\* P | [Sorting Logic Blocks](https://nrich.maths.org/7192) \* G  [What Shape?](http://nrich.maths.org/6986) \* G P  [Shapes on the Playground](http://nrich.maths.org/1054) \*\* P  [A Cartesian Puzzle](http://nrich.maths.org/public/viewer.php?obj_id=1110) \* P  [Symmetry Challenge](http://nrich.maths.org/public/viewer.php?obj_id=1886) \*\*\* I  Coordinate Challenge \* P  School Fair Necklaces \*\* I | |
| **Question Bank** | What’s the same, what’s different?  What is the same and what is different about the diagonals of these 2-D shapes?  Visualising  Imagine a square cut along the diagonal to make two triangles. Describe the triangles.  Join the triangles on different sides to make new shapes. Describe them. (you could sketch them)  Are any of the shapes symmetrical? Convince me.  Always, sometimes, never | Is it always, sometimes or never true that the two diagonals of a rectangle meet at right angles?  Other possibilities  Can you show or draw a polygon that fits both of these criteria?  What do you look for?  ”Has exactly two equal sides.”  ”Has exactly two parallel sides.”  Other possibilities Can you draw a non-right-angled triangle with a line of symmetry?  Are there other possibilities.  Convince me  Ayub says that he can draw a right-angled triangle which has another angle which is obtuse.  Is he right?  Explain why. | |
| **Curriculum Links** | Connect work on Geometry with area and perimeter, e.g. calculate the area (by counting squares) and perimeter of given shapes.  Connect work on Geometry with measuring and reading scales, e.g. using rulers and protractors to draw simple shapes accurately.  Connect work on Geometry with co-ordinate positions in the first quadrant, e.g. plot given co-ordinate positions and connect the points – what polygon have you made?  The world around them – e.g. symmetry on wrapping paper, tiles, letters and digits on labels.  Design Technology – e.g. the use of different triangles in bridge building  Physical Education – e.g. using symmetry to create dance sequences, gymnastic routines  I.C.T – e.g. using programmable robots to create specific shapes or a symmetrical dance sequence.  Art – The NCETM Primary Magazine [**‘Art of Mathematics’**](https://www.ncetm.org.uk/resources/38454), features has many different articles where works of art are used as a stimulus for shape work. E.g. Islamic Patterns e.g. https://www.ncetm.org.uk/resources/18030 | | |
| **Concept** | **Geometry: Position & Direction** | | |
| **National Curriculum** | Describe positions on a 2-D grid as coordinates in the first quadrant  Plot specified points and draw sides to complete a given polygon  Describe movements between positions as translations of a given unit to the left/ right and up/ down | | |
| **White Rose Small Steps** | Describe position  Draw on a grid  Move on a grid  Describe a movement on a grid | | |
| **Nrich** |  | | |
| **Question Bank** | **Working backwards**  Here are the co-ordinates of corners of a rectangle which has width of 5.  (7, 3) and (27, 3) What are the other two co-ordinates? | | |
| **Curriculum Links** | Geography, when learning about map referencing and directions.  DT, when designing rooms, planning buildings and construction projects  Art, when looking at patterns and architecture | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Make suggestions of ways to solve a range of problems  Develop and apply a systematic approach  Find and predict possibilities that match the context using patterns spotted to support  Independently check and improve work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve)*  Pattern spot and with support, express generalisations/rules in words  Make and investigate conjectures and provide examples and counter-examples  When they have solved a problem, pose a similar problem for a peer | Provide a clear, correct, logical justification and with support, express generalisation/rules formed in words  Reflect on others’ justifications and use this to improve their work  Edit and improve their own and a peer’s justification  Investigate ‘what if?’ questions.  Create ‘what if?’ questions |

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| **Year 4 Summer Term CFC** | | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | | |
| **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** | |
| Count forwards and backwards, in multiples of 12, from zero or any other multiple, up to 12x12  Count up and down in tenths and hundredths | Count forwards and backwards, in any multiples up to 12, from zero or any other multiple, up to 12x12 | Recall multiples of 9, up to 12x8, in any order, including missing numbers and related division facts  Recall multiples of 11, up to 12x11, in any order, including missing numbers and related division facts | Recall multiples of 9, up to 12x8, in any order, including missing numbers and related division facts  Recall multiples of 12, up to 12x12, in any order, including missing numbers and related division facts | Divide a one-digit by 10 *(1.d.p)*  Divide a two-digit by 10 *(1.d.p)*  Divide a one-digit by 100 *(2.d.p.)*  Divide a two-digit by 100 *(2.d.p.)* |  | Add decimals up to 2.d.p., using a formal written method *(column addition)*  Subtract decimals up to 2.d.p., using a formal written method *(column subtraction)* | | Multiply a two-digit number by a one-digit number using a formal written layout *(short multiplication)*  Multiply a three-digit number by a one-digit number using a formal written layout *(short multiplication)* |

**Year 5: Long Term Plan**

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| ***Y5*** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **TERM 1** | Counting, number & place value | | | Addition & subtraction | | Statistics | | Multiplication & division | | Perimeter & area | |  | | | |
| **TERM 2** | Multiplication & division | | | Fractions | | | | | | Decimals & percentages | |  |  | | |
| **TERM 3** | Decimals | | | | Properties of shape | | | Position & direction | Converting units | | Volume |  | |  | |

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| **Year 5 Autumn Term Medium Term Planning** | | | | | | | |
| **Concept** | **Counting, number & place value** | | | | | | |
| **National Curriculum** | Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit  Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000  Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero  Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000  Solve number problems and practical problems that involve all of the above  Read Roman numerals up to 1,000 (M) and recognise years written in Roman numerals | | | | | | |
| **White Rose Small Steps** | Numbers to 10,000  Roman Numerals to 1,000  Round to nearest 10, 100 and 1,000  Number to 100,000  Compare and order numbers to 100,000  Round numbers within100,000  Numbers to a million  Counting in 10s, 100s, 1,000s, 10,000s, and 100,000s  Compare and order numbers to one million  Round numbers to one million  Negative numbers | | | | | | |
| **Nrich** | Tug Harder! \* G  Greater Than or Less Than? \* I  Spiralling Decimals \*\*\* G  Round the Dice Decimals 1 \* P I  Round the Dice Decimals 2 \* | | | | | | |
| **Question Bank** | **Spot the mistake**:  177000,187000,197000,217000 What is wrong with this sequence of numbers?  **True or False?**  When I count in 10’s I will say the number 10100?  **What comes next?**  646000-10000= 636000 636000 –10000 = 626000 626000- 10000 = 616000 …….  **Missing numbers**  6 x 0.9 = x 0.03 6 x 0.04 = 0.008 x  Which numbers could be written in the boxes? | **Making links** Apples weigh about 170 g each. How many apples would you expect to get in a 2 kg bag?  **Do, then explain**  747014 774014 747017 774077 744444  If you wrote these numbers in order starting with the smallest, which number would be third?  Explain how you ordered the numbers. | | **Missing symbol**  Put the correct symbol < or > in each box  4.627 4.06 12.317 12.31  What needs to be added to 3.63 to give 3.13? What needs to be added to 4.652 to give 4.1?  **Do, then explain**  Show the value of the digit 5 in these numbers? 350114 567432 985376 Explain how you know.  **Possible answers**  A number rounded to the nearest thousand is 76000 What is the largest possible number it could be? | | **What do you notice?**  Round 343997 to the nearest 1000. Round it to the nearest 10000. What do you notice? Can you suggest other numbers like this?  **Do, then explain**  Circle each decimal which when rounded to one decimal place is 6.2.  6.32 6.23 6.27 6.17 Explain your reasoning  **Top tips**  Explain how to round decimal numbers to one decimal place? | |
| **Curriculum Links** | **Addition and subtraction**  When working on number and place value and/or addition and subtraction there are opportunities to make connections between them for example:  Numbers with decimals are frequently seen in real life, so give the children opportunities to add and subtract these in context. For example, you could give them catalogues or take away menus and ask them to choose two or three items to buy. You could give them a budget and ask them total the prices and find out how much of their budget is left.  You could ask the children to measure the lengths of different objects around the classroom and to find their total length. They could then represent these measurements in centimetres and metres. They could then convert them into metre measurements using decimals, for example 3m 24cm would become 3.24m. You could ask them to find out what length they would need to make a longer length that you give them, such as 10m. They could do similar activities for volume and capacity and also mass.  Encourage the children to consider whether a mental calculation strategy or a written strategy would be most efficient for their additions and subtractions. They could also make estimates of the totals and differences using rounding.  **Multiplication and division**  When working on number and place value and/or multiplication and division there are opportunities to make connections between them, for example:  You could make up problems for the children to solve that involve multiplication and division for example:   * Harris had £38. 96. He shared his money into four equal piles. How much money was in each pile? * Naomi was making some fruit juice for a party. She decided each person would need 350ml of juice. If there were 24 people at the party, how many litres of juice does she need to make?   Give the children place value grids similar to the one below and a set of digit cards:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | 1000 | 100 | 10 | 1 | . | 1/10 | 1/100 | |  |  |  |  |  |  |  |   Ask them to make a three digit number, such as 569 and place it in the grid. They can then multiply the number by ten, using the zero as a place holder. They could then divide their number by 10, 100 and 1000 and describe what is happening: the number is becoming 10/100/1000 times smaller the digits are moving to the right. | **Fractions (including decimals and percentages)**  When working on number and place value and/or fractions (including decimals and percentages) there are opportunities to make connections between them for example:  Using the place value grid suggested above and digit cards, ask the children to make a number that fills the grid. Discuss what each digit is worth. For example, with the number 2315.67 the 2 is in the thousands position so that tells us how many thousands it represents – so the value shown in that column is 2000 the 3 is in the hundreds position so is 300 and so on. When you discuss the 6 and 7 ensure that the children recognise that the 6 is in the tenths position so is worth 6/10 or 0.6 and the 7 is in the hundredths position so is worth 7/100 or 0.07. They could write the numbers they make in words so that they reinforce their place value. They should also model them with structured base 10 apparatus.  You could take five examples of the numbers that the children have made in their grids write them on the board and then ask the children to order them in ascending or descending order.  Ask problems involving mass, for example:   * Charlie has three cats. Macy weighs 3kg 250g , Tia weighs 2kg 175g and Elvis weighs 4kg 125g. What would these masses be in kilograms only? In kilograms work out the total mass of the three cats? * Georgie was making a cake; she needed 1.6kg of flour 350g of butter and 750g of sugar. What is the total mass of these ingredients? * Samir made five jugs of juice. For each he used 2 litres of water and 245ml of cordial. How many litres of liquid did he use altogether. | | **Measurement**  When working on number and place value and/or measures there are opportunities to make connections between them, for example:  Give the children a list of different metric units and ask them to write them in different ways. For example:   * 3km 50m could also be written as 3050m or 3.05km * 2m 10cm could also be written as 210cm or 2.1m * 13cm 7mm could also be written as 137mm or 13.7cm * 6l 75ml could also be written as 6075ml or 6.075l   Using maps the children could work out distances to different places. These are likely to have a scale in centimetres. The children could convert these to kilometres to find the actual distances.  Within the science curriculum there are opportunities to work with number and place value, for example, in the introduction of the Upper Key Stage 2 Programme of Study it states that pupils should select the most appropriate ways to answer science questions using different types of scientific enquiry including observing changes over different periods of time noticing patterns grouping and classifying things carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. The children could, for example, record changes over periods of time and compare them. You could discuss the differences in the place value of periods of time and the number system. They could record, for example, heights of plants accurately using decimal notation. | | Within the geography curriculum there are opportunities to connect with number and place value for example in the introduction of the Key Stage 2 Programme of Study it states that pupils should extend their knowledge and understanding beyond the local area to include the United Kingdom and Europe North and South America. This will include the location and characteristics of a range of the world’s most significant human and physical features. Children could, for example, find and compare distances between countries or cities temperatures lengths of rivers heights of mountains. These comparisons will involve finding differences which involve a secure understanding of place value.  See, for example:   * [**Weather**](https://www.ncetm.org.uk/resources/34335) * [**Environments around the world**](https://www.ncetm.org.uk/resources/28569) * [**Mathematics and geography**](https://www.ncetm.org.uk/resources/28334)   Within the history curriculum there are opportunities to work with number and place value for example in the introduction of the Key Stage 2 Programme of Study it states that pupils should continue to develop a chronologically secure knowledge and understanding of British local and world history establishing clear narratives within and across the periods they study. The children could, when studying the Roman period, focus on their number system and find out how it developed.[**A Little bit of History**](https://www.ncetm.org.uk/resources/11689) in issue 2 of the Primary Magazine has information about this. They could also look at the development of our number system. [**A Little bit of History**](https://www.ncetm.org.uk/resources/15194) in issue 8 of the Primary Magazine has information about this. | |
| **Concept** | **Addition & subtraction** | | | | | | |
| **National Curriculum** | Add and subtract numbers mentally with increasingly large numbers  Add and subtract whole numbers with more than 4digits, including using formal written methods (columnar addition and subtraction)  Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy  Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why | | | | | | |
| **White Rose Small Steps** | Add whole numbers with more than 4digits (column method)  Subtract whole numbers with more than 4digits (column method)  Round to estimate and approximate  Inverse operations (addition and subtraction)  Multi-step addition and subtraction problems | | | | | | |
| **Nrich** | [Twenty Divided into Six](http://nrich.maths.org/public/viewer.php?obj_id=1047) \*\* P  [Reach 100](http://nrich.maths.org/public/viewer.php?obj_id=1130) \*\*\* P  [Two and Two](http://nrich.maths.org/public/viewer.php?obj_id=781) \*\*\* P I  [Journeys in Numberland](http://nrich.maths.org/7285) \* I  [Maze 100](https://nrich.maths.org/91) \*\* P | | | | | | |
| **Question Bank** | **True or false?**  Are these number sentences true or false?6.17 + 0.4 = 6.57 8.12 – 0.9 = 8.3 Give your reasons.  **Hard and easy questions**  Which questions are easy / hard?  213323 - 70 = 512893 + 300 = 819354 - 500 = 319954 + 100 =  Explain why you think the hard questions are hard?  **Making an estimate**  Which of these number sentences have the answer that is between 0.5 and 0.6 | | | | 11.74 - 11.18 33.3 – 32.71  **Always, sometimes, never**  Is it always, sometimes or never true that the sum of four even numbers is divisible by 4?  **Convince me**    + 1475 = 6 24  What numbers go in the boxes? What different answers are there? Convince me | | |
| **Curriculum Links** | **Money** – when required to add prices, calculate change, add surcharges or interest, or subtract discounts;  **Measurement** – when required to add lengths, calculate remaining distance in a journey, find how much more/less liquid is needed, add quantities when cooking, calculate perimeters of regular and irregular shapes, work out time differences e.g. how many days until Christmas, how many minutes until break time etc.;  **Statistics** – comparing and combining sets of data, interpreting data.  Learners will encounter addition and subtraction in: | | | **Science** – when adding and subtracting test measurements;  **History** – when comparing historical data from different periods, calculating the duration of monarchs' reign;  **Geography** – when comparing populations, temperatures and other data for contrasting regions around the world. | | | |
| **Concept** | **Statistics** | | | | | | |
| **National Curriculum** | Solve comparison, sum and difference problems using information presented in a line graph  Complete, read and interpret information in tables including timetables | | | | | | |
| **White Rose Small Steps** | Read and interpret line graphs  Draw line graphs  Use line graphs to solve problems  Read and interpret tables  Two-way tables  Timetables | | | | | | |
| **Nrich** |  | | | | | | |
| **Question Bank** | **True or false?** (Looking at a train time table) “If I want to get to Exeter by 4 o’clock this afternoon, I will need to get to Taunton station before midday”.  **Is this true or false?**  **Convince me.**  Make up your own ‘true/false’ statement about a journey using the timetable.  **What’s the same, what’s different?**  Pupils identify similarities and differences between different representations and explain them to each other  Create a questions Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives. | | | | | | |
| **Curriculum Links** | In science, they will be required to represent and interpret data collected in science investigations.  In geography, they will be plotting and interpreting data for international and local weather as well as other geographical data for population, land use etc.  Statistics are also used in everyday life. E.g. when reading bus timetables and information charts. | | | | | | |
| **Concept** | **Multiplication & division** | | | | | | |
| **National Curriculum** | Multiply and divide numbers mentally drawing upon known facts  Multiply and divide whole numbers by 10, 100 and 1000  Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers  Recognise and use square numbers and cube numbers and the notation for squared (2) and cubed (3)  Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes  Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers  Establish whether a number up to 100 is prime and recall prime numbers up to 19 | | | | | | |
| **White Rose Small Steps** | Multiples  Factors  Common factors  Prime numbers  Square numbers  Cube numbers  Multiply by 10, 100 and 1,000  Divide by 10, 100 and 1,000  Multiples of 10, 100 and 1,000 | | | | | | |
| **Nrich** | [Sweets in a Box](http://nrich.maths.org/public/viewer.php?obj_id=84) \* P I  [Which Is Quicker?](http://nrich.maths.org/1817) \* P  [Multiplication Squares](http://nrich.maths.org/public/viewer.php?obj_id=1134) \* P I  [Flashing Lights](http://nrich.maths.org/public/viewer.php?obj_id=1014) \* P  [Abundant Numbers](http://nrich.maths.org/1011) \* I  [Factor Track](http://nrich.maths.org/7468) \*\* G P | | [Factors and Multiples Game](http://nrich.maths.org/public/viewer.php?obj_id=5468) \* G  [Pebbles](https://nrich.maths.org/48) \*\* I  [Two Primes Make One Square](http://nrich.maths.org/public/viewer.php?obj_id=1150) \*\* I  [Up and Down Staircases](http://nrich.maths.org/public/viewer.php?obj_id=2283) \* P  [One Wasn’t Square](http://nrich.maths.org/public/viewer.php?obj_id=1119) \*\* P | | [Cycling Squares](http://nrich.maths.org/public/viewer.php?obj_id=1151) \*\* P  [Picture a Pyramid …](https://nrich.maths.org/5809) \*\* P  [Curious Number](http://nrich.maths.org/7218) \*\*\* P I  [Division Rules](https://nrich.maths.org/10490) \* P I  [Make 100](http://nrich.maths.org/public/viewer.php?obj_id=1013) \*\* P I | | [Multiply Multiples 1](https://nrich.maths.org/10421) \* I  [Multiply Multiples 2](https://nrich.maths.org/10424) \* I  [Multiply Multiples 3](https://nrich.maths.org/10478) \* I  [Highest and Lowest](http://nrich.maths.org/943) \* P I  [Four Goodness Sake](http://nrich.maths.org/1081) \*\*\* P |
| **Question Bank** | **Use a fact**  3 x 75 = 225 Use this fact to work out 450 ÷ 6 = 225 ÷ 0.6 =  To multiply by 25 you multiply by 100 and then divide by 4. Use this strategy to solve  48 x 25 78 x 25 4.6 x 25  **Making links**  7 x 8 = 56 How can you use this fact to solve these calculations?  0.7 x 0.8 = 5.6 ÷ 8 =  **Use the inverse**  Use the inverse to check if the following calculations are correct:  4321 x 12 = 51852 507 ÷ 9 = 4563  **Size of an answer**  The product of a two digit and three digit number is approximately 6500. What could the numbers be?  **Prove It** | | | What goes in the missing box?  12 2 ÷ 6 = 212 14 4 ÷ 7 = 212  22 3 ÷ 7 = 321 r 6 323 x 1 = 13243  Prove it.  **Always, sometimes, never?**  Is it always, sometimes or never true that multiplying a number always makes it bigger  Is it always, sometimes or never true that prime numbers are odd?  Is it always, sometimes or never true that when you multiply a whole number by 9, the sum of its digits is also a multiple of 9  Is it always, sometimes or never true that a square number has an even number of factors? | | | |
| **Curriculum Links** | **Fractions (including decimals and percentages)**  When working on multiplication and division and/or fractions (including decimals and percentages), there are opportunities to make connections between them, for example:  You could give the children strips of paper and ask them to fold them to show you different proper and mixed fractions, for example, 5⁄8, 1 3⁄4. Next ask them to multiply these fractions by single digit numbers. They could use the strips to help them: 1 5⁄8 x 6  1x 6 = 6  5⁄8 x 6 = 30⁄8 or 3 6⁄8  1 5⁄8 x 6 = 6 + 3 6⁄8 = 9 6⁄8 or 9 3⁄4  Numbers with decimals are frequently seen in real life, for example when using money, so give the children opportunities to multiply these in context. For example, you could give them take-away menus and ask them to find out how much it would cost to buy four of a meal deal or a particular course. You could give them the total cost of six of the same dish and ask to work out which dish you chose.  You could ask the children problems that involve multiplying numbers up to 3 decimal places and link to measures, such as:   * Jessie had eight lengths of rope. Each was1m 36cm. If he put them side by side what would the total length be? * Paddy had 12 cartons of orange juice. Each carton contained 0.750l. How much juice did he have altogether? * Suzie, the baker, was making 14 loaves of bread for the local supermarket. For each loaf she needed 1.275kg of flour. What is the total amount of flour that she needed? * India took part in a sponsored bike ride at her school. She cycled 25 times around the perimeter of the school playground. The perimeter is 105.34m. How far did she travel?   **Measurement**  When working on multiplication and division and/or measurement there are opportunities to make connections between them, for example:  You could give the children opportunities to rehearse multiplying by 10, 100 and1000 by converting, for example, millimetres to centimetres, centimetres to metres, metres to kilometres. They could then multiply lengths, masses and capacities of different sizes, for example, 14.75kg by 8. You could then put these into problem format, for example:   * Benji, a party organiser, was going to make a fruit punch. For each guest he needed 0.250ml of orange juice and 0.250l of mango juice. If there are 25 guests coming to the party, what is the total amount of juice Benji needs? | | | You could give the children an approximate equivalence between miles and kilometres, for example1.6km is approximately 1 mile. Then they multiply this amount to find approximate equivalences for other miles, for example 5 miles, 8 miles, 10 miles, 14 miles. The children could make a spider diagram for this and other equivalences.  You could give the children lengths of one side of different regular polygons, for example, pentagon, octagon, decagon, dodecagon and ask them to find their perimeters by multiplying each length by the number of sides the polygon has.  You could also give the children the lengths of different sized rectangles and ask them to find their areas, for example, a rectangle 28cm by 12cm.  Set problems involving time and money for the children to use, for example:   * Samir spent 45 minutes completing his homework. It took Pete three times as long. How long did it take Pete to complete his homework? * It took Carol 1 ½ hours to drive from Oxford to London. It took Lorna a third of that time. How long did it take Lorna to travel to London? * Harry is given £3.75 a week as pocket money. He is saving it to buy a computer game. How much will he have saved over 8 weeks? What about 12 weeks? * Georgie saved £2.25 of her pocket money each week. How much will she have saved over 9 weeks? * Penny had saved £75 over a period of 12 weeks. She saved an equal amount every week. How much did she save each week?   Within the geography curriculum there are opportunities to connect with multiplication and division, for example in the introduction of the Key Stage 2 Programme of Study it states that pupils should extend their knowledge and understanding beyond the local area to include the United Kingdom and Europe, North and South America. This will include the location and characteristics of a range of the world’s most significant human and physical features. Children could, for example, find out about the currencies used in a selection of countries. They could then make up a currency converter using mental calculation strategies and then check using multiplication, for example:  £1= 1.20 Euros £2 = 2.40 Euros £3 = 3.60 Euros £4 = 4.80 Euros £5 = 6 Euros | | | |
| **Concept** | **Perimeter & area** | | | | | | |
| **National Curriculum** | Measure and calculate the perimeter of composite rectilinear shapes in cm and m  Calculate and compare the area of rectangles (including squares), and including using standard units, cm², m²estimate the area of irregular shapes | | | | | | |
| **White Rose Small Steps** | Measure perimeter  Calculate perimeter  Find unknown lengths  Area of rectangles  Area of compound shapes  Estimate and approximate area | | | | | | |
| **Nrich** | [Area and Perimeter](http://nrich.maths.org/7280) \* I  Through the Window \* I  [Numerically Equal](http://nrich.maths.org/public/viewer.php?obj_id=1045) \*\* P  [Shaping It](http://nrich.maths.org/7301) \* I | | | [Cubes](http://nrich.maths.org/42) \* P I  [Fitted](http://nrich.maths.org/public/viewer.php?obj_id=1854) \*\*\* P  [Brush Loads](http://nrich.maths.org/public/viewer.php?obj_id=4911) \* P I  [Making Boxes](http://nrich.maths.org/public/viewer.php?obj_id=89) \*\* I | | | |
| **Question Bank** | **Testing conditions**  Shape A is a rectangle that is 4m long and 3m wide.  Shape B is a square with sides 3m.  The rectangles and squares are put together side by side to make a path which has perimeter between 20 and 30 m.  For example  Can you draw some other arrangements where the perimeter is between 20 and 30 metres?  **Always, sometimes, never**  When you cut off a piece of a shape you reduce its area and perimeter. | | | | | | |
| **Curriculum Links** |  | | | | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Make suggestions of ways to solve a range of problems  Organise work from the outset, looking for ways to record and work systematically  Find and predict possibilities that match the context using patterns spotted to support  Independently check and improve work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve)*  Pattern spot and independently express generalisations/rules in words  Make and investigate conjectures and provide examples and counter-examples  When they have solved a problem, pose a similar problem for a peer | Provide a clear, correct, logical justification, expressing generalisation/rules in words.  Reflect on others’ justifications and use this to improve their work.  Edit and improve their own and a peer’s justification.  Investigate ‘what if?’ questions.  Create ‘what if? ‘questions |

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| **Year 5 Autumn Term CFC** | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | |
| **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** |
| Count forwards and backwards with positive and negative whole numbers, including through zero  Count forwards or backwards in steps of powers of 10 *(10s, 100s, 1,000s, 10,000s, 100,000s)* for any given number up to 1 000 000 | Count forwards and backwards, in any multiples up to 12, from zero or any other multiple, up to 12x12 | Recall multiples of 12, up to 12x12, in any order, including missing numbers and related division facts  Recall multiples of all times tables up to 12x12, in any order, including missing numbers and related division facts  Derive and recall addition doubles for multiples of 10, 100 and 1000 *(30+30, 400+400, 2000+2000)* | Recall multiples of all times tables up to 12x12, in any order, including missing numbers and related division facts  Recall prime numbers up to 19  Recall squares to 12 x 12  Recall cube numbers  Derive and recall factor pairs to 100 *(56 (1x56, 2x28, 4x14, 7x8))* | Add a near multiple of 10, 100 or 1000 to any number *(3235+1198)*  Subtract a near multiple of 10, 100 or 1000 from any number *(3235-1198)* | Multiply pairs of multiples of 10 *(60x30)*  Multiply a multiple of 100, by a one-digit *(400x3)*  Divide a multiple of 10 by a one-digit *(whole number answers) (80÷4, 270÷3)*  Multiply numbers, up to 100, by a one-digit *(67x3)*  Divide numbers, up to 100, by a one-digit *(68÷4)*  Divide numbers, up to 100, by a one-digit, with remainders *(69÷4)*  Multiply whole numbers, by 10, 100 and 1000 *(whole number answers)*  Divide, whole numbers, by 10, 100 and 1000 *(whole number answers)* | Add whole numbers with more than 4-digits, using a formal written methods *(column addition)*  Subtract whole numbers with more than 4-digits, using a formal written methods *(column subtraction)* | |

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| **Year 5 Spring Term Medium Term Planning** | | | | |
| **Concept** | **Multiplication & division** | | | |
| **National Curriculum** | Multiply and divide numbers mentally drawing upon known facts  Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for 2-digit numbers  Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context  Solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the use of the equals sign. | | | |
| **White Rose Small Steps** | Multiply 4-digits by 1-digit  Multiply 2-digits (area model)  Multiply 2-digits by 2-digits  Multiply 3-digits by 2-digits  Multiply 4-digits by 2-digits  Divide 4-digits by 1-digit  Divide with remainders | | | |
| **Nrich** | [Sweets in a Box](http://nrich.maths.org/public/viewer.php?obj_id=84) \* P I  [Which Is Quicker?](http://nrich.maths.org/1817) \* P  [Multiplication Squares](http://nrich.maths.org/public/viewer.php?obj_id=1134) \* P I  [Flashing Lights](http://nrich.maths.org/public/viewer.php?obj_id=1014) \* P  [Abundant Numbers](http://nrich.maths.org/1011) \* I  [Factor Track](http://nrich.maths.org/7468) \*\* G P | [Factors and Multiples Game](http://nrich.maths.org/public/viewer.php?obj_id=5468) \* G  [Pebbles](https://nrich.maths.org/48) \*\* I  [Two Primes Make One Square](http://nrich.maths.org/public/viewer.php?obj_id=1150) \*\* I  [Up and Down Staircases](http://nrich.maths.org/public/viewer.php?obj_id=2283) \* P  [One Wasn’t Square](http://nrich.maths.org/public/viewer.php?obj_id=1119) \*\* P | [Cycling Squares](http://nrich.maths.org/public/viewer.php?obj_id=1151) \*\* P  [Picture a Pyramid …](https://nrich.maths.org/5809) \*\* P  [Curious Number](http://nrich.maths.org/7218) \*\*\* P I  [Division Rules](https://nrich.maths.org/10490) \* P I  [Make 100](http://nrich.maths.org/public/viewer.php?obj_id=1013) \*\* P I | [Multiply Multiples 1](https://nrich.maths.org/10421) \* I  [Multiply Multiples 2](https://nrich.maths.org/10424) \* I  [Multiply Multiples 3](https://nrich.maths.org/10478) \* I  [Highest and Lowest](http://nrich.maths.org/943) \* P I  [Four Goodness Sake](http://nrich.maths.org/1081) \*\*\* P |
| **Question Bank** | **Use a fact**  3 x 75 = 225 Use this fact to work out 450 ÷ 6 = 225 ÷ 0.6 =  To multiply by 25 you multiply by 100 and then divide by 4. Use this strategy to solve  48 x 25 78 x 25 4.6 x 25  **Making links**  7 x 8 = 56 How can you use this fact to solve these calculations?  0.7 x 0.8 = 5.6 ÷ 8 =  **Use the inverse**  Use the inverse to check if the following calculations are correct:  4321 x 12 = 51852 507 ÷ 9 = 4563  **Size of an answer**  The product of a two digit and three digit number is approximately 6500. What could the numbers be?  **Prove It** | | What goes in the missing box?  12 2 ÷ 6 = 212 14 4 ÷ 7 = 212  22 3 ÷ 7 = 321 r 6 323 x 1 = 13243  Prove it.  **Always, sometimes, never?**  Is it always, sometimes or never true that multiplying a number always makes it bigger  Is it always, sometimes or never true that prime numbers are odd?  Is it always, sometimes or never true that when you multiply a whole number by 9, the sum of its digits is also a multiple of 9  Is it always, sometimes or never true that a square number has an even number of factors? | |
| **Curriculum Links** | **Fractions (including decimals and percentages)**  When working on multiplication and division and/or fractions (including decimals and percentages), there are opportunities to make connections between them, for example:  You could give the children strips of paper and ask them to fold them to show you different proper and mixed fractions, for example, 5⁄8, 1 3⁄4. Next ask them to multiply these fractions by single digit numbers. They could use the strips to help them: 1 5⁄8 x 6  1x 6 = 6  5⁄8 x 6 = 30⁄8 or 3 6⁄8  1 5⁄8 x 6 = 6 + 3 6⁄8 = 9 6⁄8 or 9 3⁄4  Numbers with decimals are frequently seen in real life, for example when using money, so give the children opportunities to multiply these in context. For example, you could give them take-away menus and ask them to find out how much it would cost to buy four of a meal deal or a particular course. You could give them the total cost of six of the same dish and ask to work out which dish you chose.  You could ask the children problems that involve multiplying numbers up to 3 decimal places and link to measures, such as:   * Jessie had eight lengths of rope. Each was1m 36cm. If he put them side by side what would the total length be? * Paddy had 12 cartons of orange juice. Each carton contained 0.750l. How much juice did he have altogether? * Suzie, the baker, was making 14 loaves of bread for the local supermarket. For each loaf she needed 1.275kg of flour. What is the total amount of flour that she needed? * India took part in a sponsored bike ride at her school. She cycled 25 times around the perimeter of the school playground. The perimeter is 105.34m. How far did she travel?   **Measurement**  When working on multiplication and division and/or measurement there are opportunities to make connections between them, for example:  You could give the children opportunities to rehearse multiplying by 10, 100 and1000 by converting, for example, millimetres to centimetres, centimetres to metres, metres to kilometres. They could then multiply lengths, masses and capacities of different sizes, for example, 14.75kg by 8. You could then put these into problem format, for example:   * Benji, a party organiser, was going to make a fruit punch. For each guest he needed 0.250ml of orange juice and 0.250l of mango juice. If there are 25 guests coming to the party, what is the total amount of juice Benji needs? | | You could give the children an approximate equivalence between miles and kilometres, for example1.6km is approximately 1 mile. Then they multiply this amount to find approximate equivalences for other miles, for example 5 miles, 8 miles, 10 miles, 14 miles. The children could make a spider diagram for this and other equivalences.  You could give the children lengths of one side of different regular polygons, for example, pentagon, octagon, decagon, dodecagon and ask them to find their perimeters by multiplying each length by the number of sides the polygon has.  You could also give the children the lengths of different sized rectangles and ask them to find their areas, for example, a rectangle 28cm by 12cm.  Set problems involving time and money for the children to use, for example:   * Samir spent 45 minutes completing his homework. It took Pete three times as long. How long did it take Pete to complete his homework? * It took Carol 1 ½ hours to drive from Oxford to London. It took Lorna a third of that time. How long did it take Lorna to travel to London? * Harry is given £3.75 a week as pocket money. He is saving it to buy a computer game. How much will he have saved over 8 weeks? What about 12 weeks? * Georgie saved £2.25 of her pocket money each week. How much will she have saved over 9 weeks? * Penny had saved £75 over a period of 12 weeks. She saved an equal amount every week. How much did she save each week?   Within the geography curriculum there are opportunities to connect with multiplication and division, for example in the introduction of the Key Stage 2 Programme of Study it states that pupils should extend their knowledge and understanding beyond the local area to include the United Kingdom and Europe, North and South America. This will include the location and characteristics of a range of the world’s most significant human and physical features. Children could, for example, find out about the currencies used in a selection of countries. They could then make up a currency converter using mental calculation strategies and then check using multiplication, for example:  £1= 1.20 Euros £2 = 2.40 Euros £3 = 3.60 Euros £4 = 4.80 Euros £5 = 6 Euros | |
| **Concept** | **Fractions** | | | |
| **National Curriculum** | Compare and order fractions whose denominators are multiples of the same number  Identify, name and write equivalent fractions of a given fraction, represented visually including tenths  and hundredths  Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number [for example 2/5 + 4/5 = 6/5 = 1+1/5]  Add and subtract fractions with the same denominator and denominators that are multiples of the same number  Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams  Read and write decimal numbers as fractions [ for example 0.71 = 71/100)  Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates. | | | |
| **White Rose Small Steps** | Equivalent fractions  Improper fractions to mixed numbers  Mixed numbers to improper fractions  Number sequences  Compare and order fractions less than 1  Compare and order fractions greater than 1  Add and subtract fractions  Add fractions within 1  Add 3 or more fractions  Add fractions  Add mixed numbers  Subtract fractions  Subtract mixed numbers  Subtract – breaking the whole  Subtract 2 mixed numbers  Multiply unit fractions by an integer  Multiply non-unit fractions by an integer  Multiply mixed numbers by integers  Fraction of an amount  Using fractions as operators | | | |
| **Nrich** | [Balance of Halves](https://nrich.maths.org/5677) \* P  [Route Product](http://nrich.maths.org/public/viewer.php?obj_id=5632) \*\* P I  [Forgot the Numbers](http://nrich.maths.org/public/viewer.php?obj_id=1015) \*\* I | | | |
| **Question Bank** | Give an example of a fraction that is more than three quarters.  Now another example that no one else will think of.  Explain how you know the fraction is more than three quarters.  Imran put these fractions in order starting with the smallest. Are they in the correct order?  Two fifths, three tenths, four twentieths How do you know?  **Odd one out.**  Which is the odd one out in each of these collections of 4 fractions  6/10 3/5 18/20 9/15 30/100 3/10 6/20 3/9 Why?  **What do you notice?**  Find 30/100 of 200 Find 3/10 of 200 What do you notice?  Can you write any other similar statements?  **Complete the pattern**   |  |  |  |  | | --- | --- | --- | --- | | 71  100 | ??  100 | ??  100 | ??  100 | | 0.71 | 0.81 | ??? | ??? |   Complete the table.  **Another and another** Write a fraction with a denominator of one hundred which has a value of more than 0.75? … and another, … and another, … | | **Ordering**  Put these numbers in the correct order, starting with the largest.  7/10, 0.73, 7/100, 0.073 71% Explain your thinking  **What do you notice?**  ¾ and ¼ = 4/4 = 1 4/4 and ¼ = 5/4 = 1 ¼ 5/4 and ¼ = 6/4 = 1 ½  Continue the pattern up to the total of 2.  Can you make up a similar pattern for subtraction?  The answer is 1 2/5 , what is the question  **Continue the pattern**  ¼ x 3 = ¼ x 4 = ¼ x 5 =  Continue the pattern for five more number sentences. How many steps will it take to get to 3?  5/3 of 24 = 40  Write a similar sentence where the answer is 56.  The answer is 2 ¼ , what is the question  Give your top tips for multiplying fractions. | |
| **Curriculum Links** | When converting units of measure, children need a good understanding of decimals, e.g. converting cm to m, g to kg etc.  Children should also be required to use fractions and percentages when interpreting and evaluating data.  Fractions may be used when describing turns.  **Measurement** – when calculating measures for recipes, calculating journey times and fuel consumption  **Money** – working out the result of sales offers, tips/gratuities on bills, comparing prices  **Statistics** – interpreting and evaluating data e.g. 19% of the world’s population lives in China | | | |
| **Concept** | **Decimals & percentages** | | | |
| **National Curriculum** | Read, write, order and compare numbers with up to three decimal places  Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents  Round decimals with two decimal places to the nearest whole number and to one decimal place  Solve problems involving number up to three decimal places  Recognise the per cent symbol (%) and understand that per cent relates to ‘number of parts per hundred’, and write percentages as a fraction with denominator 100, and as a decimal  Solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25 | | | |
| **White Rose Small Steps** | Decimals up to 2 d.p.  Decimals as fractions (1)  Decimals as fractions (2)  Understand thousandths  Thousands as decimals  Rounding decimals  Order and compare decimals  Understand percentages  Percentages as fractions and decimals  Equivalent F.D.P | | | |
| **Nrich** |  | | | |
| **Question Bank** | **What do you notice?**  One tenth of £41 One hundredth of £41 One thousandth of £41  Continue the pattern What do you notice?  **Which is more:**  20% of 200 or 25% of 180?  Explain your reasoning. | | | |
| **Curriculum Links** | When converting units of measure, children need a good understanding of decimals, e.g. converting cm to m, g to kg etc.  Children should also be required to use fractions and percentages when interpreting and evaluating data.  Fractions may be used when describing turns.  **Measurement** – when calculating measures for recipes, calculating journey times and fuel consumption  **Money** – working out the result of sales offers, tips/gratuities on bills, comparing prices  **Statistics** – interpreting and evaluating data e.g. 19% of the world’s population lives in China | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Make suggestions of ways to solve a range of problems  Organise work from the outset, looking for ways to record and work systematically  Find and predict possibilities that match the context using patterns spotted to support  Independently check and improve work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve)*  Pattern spot and independently express generalisations/rules in words  Make and investigate conjectures and provide examples and counter-examples  When they have solved a problem, pose a similar problem for a peer | Provide a clear, correct, logical justification, expressing generalisation/rules in words.  Reflect on others’ justifications and use this to improve their work.  Edit and improve their own and a peer’s justification.  Investigate ‘what if?’ questions.  Create ‘what if? ‘questions |

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| **Year 5 Spring Term CFC** | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | |
| **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** |
| Count forwards and backwards, in any multiples up to 12, from zero or any other multiple, up to 12x12  Count in fractions | Count up and down in decimals up to 3.d.p.  Count up and down in % | Use the recall of multiples of all times tables up to 12x12 and related division facts to recall new facts | Recall ‘0.1 and 0.01 more’ facts, with numbers up to 2.d.p.  Recall ‘0.1 and 0.01 less facts, with numbers up to 2.d.p.  Derive and recall addition complements for 1, using bonds to 10 to support (1.d.p.) *(0.7+0.3)*  Recall fraction, decimal and % equivalents | Multiply two-digits by 8, using doubling *(26x4=double 26, double 52, double 104)*  Divide two-digit by 8, using halving *(96÷8=halve 96, halve 48, halve 24)*  Multiply numbers by 5, using x10 and halving *(320x5 = (320x10)÷2 or (320÷2)x10)*  Multiply numbers by 20, using x10 and doubling *(320x20 = (320x10)x2 or (320x2)x10)*  Multiply by 25, using x100 and halve and halve again *(48x25=48x100, then halve and halve again or (48÷4)x100)*  Multiply by 50 using x100 and halve *(48x50 =(48x100)÷2 or (48÷2)x100)* or x5 and x10 *(44x50 = (44x5)x10 or (44x10)x5)* | Derive and recall addition complements, for 1, using bonds to 100 to support (2.d.p.) *(0.73+0.27)* | Multiply a 4 digit by a one-digit using a formal written method *(short multiplication)*  Multiply a 2-digit by a 2-digit using a formal written method *(long multiplication)*  Multiply a 3-digit by a 2-digit using a formal written method *(long multiplication)*  Multiply a 4 digit by a two-digit using a formal written method *(long multiplication)*  Divide a 3 digit by a one-digit using a formal written method *(short division)*  Divide a 3 digit by a one-digit using a formal written method *(short division)* and interpret remainders appropriately for the context  Divide a 4 digit by a one-digit using a formal written method *(short division)*  Divide a 4 digit by a one-digit using a formal written method *(short division)* and interpret remainders appropriately for the context | |

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| **Year 5 Summer Term Medium Term Planning** | | | | |
| **Concept** | **Decimals** | | | |
| **National Curriculum** | Solve problems involving number up to three decimal places  Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000  Use all four operations to solve problems involving measure [ for example, length, mass, volume, money] using decimal notation, including scaling | | | |
| **White Rose Small Steps** | Add decimals within 1  Subtract decimals within 1  Complements to 100  Add decimals – cross the whole  Add numbers with the same number of decimal places  Subtract numbers with the same number of decimal places  Add numbers with different numbers of decimal places  Subtract numbers with different numbers of decimal places  Add and subtract wholes and decimals  Decimal sequences  Multiply decimals by 10, 100 and 1,000  Divide decimals by 10, 100 and 1,000 | | | |
| **Nrich** |  | | | |
| **Question Bank** | 0.085 + 0.015 = 0.1  0.075 + 0.025 = 0.1  0.065 + 0.035 = 0.1  Continue the pattern for the next five number sentences. | | | |
| **Curriculum Links** |  | | | |
| **Concept** | **Geometry: properties of shapes** | | | |
| **National Curriculum** | Identify 3D shapes, including cubes and other cuboids, from 2D representations  Use the properties of rectangles to deduce related facts and find missing lengths and angles  Distinguish between regular and irregular polygons based on reasoning about equal sides and angles  Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles  Draw given angles, and measure them in degrees (o)  Identify: angles at a point and one whole turn (total 360o), angles at a point on a straight line and ½ a turn (total 180o) other multiples of 90o | | | |
| **White Rose Small Steps** | Measure angles in degrees  Measure with a protractor  Draw lines and angles accurately  Calculate angles on a straight line  Calculate angles around a point  Calculate lengths and angles in shapes  Regular and irregular polygons  Reasoning about 3D shapes | | | |
| **Nrich** | [Egyptian Rope](http://nrich.maths.org/public/viewer.php?obj_id=982) \*\* P I  [The Numbers Give the Design](http://nrich.maths.org/6919) \* I  [Six Places to Visit](http://nrich.maths.org/public/viewer.php?obj_id=5655) \* P  [How Safe Are You?](http://nrich.maths.org/public/viewer.php?obj_id=5647) \* P  [Olympic Turns](http://nrich.maths.org/8191) \*\*\* P | | | |
| **Question Bank** | **What’s the same, what’s different?** What is the same and what is different about the net of a cube and the net of a cuboid?  **Visualising**  I look at a large cube which is made up of smaller cubes.  If the larger cube is made up of between 50 and 200 smaller cubes what might it look like?  **Connected Calculations**  The number sentence below represents the angles in degrees of an isosceles triangle.  A + B + C = 180 degrees | A and B are equal and are multiples of 5.  Give an example of what the 3 angles could be.  Write down 3 more examples  **Always, sometimes, never**  Is it always, sometimes or never true that the number of lines of reflective symmetry in a regular polygon is equal to the number of its sides n?  **Other possibilities**  A rectangular field has a perimeter between 14 and 20 metres. | What could its dimensions be?  **Other possibilities**  Here is one angle of an isosceles triangle. You will need to measure the angle accurately.  What could the other angles of the triangle be?  Are there any other possibilities? | **Convince me**  What is the angle between the hands of a clock at four o clock?  At what other times is the angle between the hands the same?  Convince me |
| **Curriculum Links** | * When working with 2D representations e.g. maps, nets, isometric drawings, plans and elevations * When using digital technology e.g. Logo, dynamic geometry to create geometric patterns | | * When looking at art and architecture to identify geometric shapes and properties * When using digital cameras to capture geometric shapes and objects in the environment and around school | |
| **Concept** | **Geometry: position & direction** | | | |
| **National Curriculum** | Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed | | | |
| **White Rose Small Steps** | Position in the first quadrant  Reflection  Reflection with coordinates  Translation  Translation with coordinates | | | |
| **Nrich** | [Transformations on a Pegboard](http://nrich.maths.org/public/viewer.php?obj_id=1813) \* P  [Square Corners](http://nrich.maths.org/public/viewer.php?obj_id=1142) \*\* I  [More Transformations on a Pegboard](http://nrich.maths.org/public/viewer.php?obj_id=4901) \*\* P I | | | |
| **Question Bank** | **Working backwards**  A square is translated 3 squares down and one square to the right.  Three of the coordinates of the translated square are:  (3, 6) (8, 11) (8, 6)  What are the co-ordinates of the original square? | | | |
| **Curriculum Links** | Learners will encounter coordinates in Geography when learning about map referencing.  Learners will encounter a range of translations in Design Technology when designing rooms, planning buildings and object designs of their own.  When focusing on patterns and architecture in Art & Design, translations will be recognised and used. | | | |
| **Concept** | **Measurement: converting units** | | | |
| **National Curriculum** | Convert between different units of metric measure [for example, km and m; cm and m; cm and mm; g and kg; l and ml]  Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints  Solve problems involving converting between units of time | | | |
| **White Rose Small Steps** | Metric units  Imperial units | | Convert units of time  Timetables | |
| **Nrich** |  | | | |
| **Question Bank** | **Working backwards**  Put these lengths of time in order starting with the longest time.  105 minutes 1 hour 51 minutes 6360 seconds  **The answer is ….**  0.3km What is the question? | | **What do you notice?** What do you notice?  1 minute = 60 seconds  60 minutes = seconds  Fill in the missing number of seconds  down some more time facts like this. | |
| **Curriculum Links** | Measurement is an area of mathematics that is used constantly in real-life situations. When decorating a room, measurement of area is needed for carpeting the floor, as well as calculating the rolls of wallpaper needed, or litres of paint required.  Working with drawings of a room to a specified scale, and determining the measurements of furniture to fit.  In Design Technology, children are often required to work to scale, accurately measuring their plans and products as they are developed. | | | |
| **Concept** | **Measurement: volume** | | | |
| **National Curriculum** | Estimate volume [for example using 1cm3 blocks to build cuboids (including cubes)] and capacity [for  example, using water]  Use all four operations to solve problems involving measure | | | |
| **White Rose Small Steps** | What is volume?  Compare volume  Estimate volume  Estimate capacity | | | |
| **Nrich** |  | | | |
| **Question Bank** | **Write more statements**  Mr Smith needs to fill buckets of water. A large bucket holds 6 litres and a small bucket holds 4 litres.  If a jug holds 250 ml and a bottle holds 500 ml suggest some ways of using the jug and bottle to fill the buckets. | | | |
| **Curriculum Links** |  | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate  Make suggestions of ways to solve a range of problems  Organise work from the outset, looking for ways to record and work systematically  Find and predict possibilities that match the context using patterns spotted to support  Independently check and improve work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve)*  Pattern spot and independently express generalisations/rules in words  Make and investigate conjectures and provide examples and counter-examples  When they have solved a problem, pose a similar problem for a peer | Provide a clear, correct, logical justification, expressing generalisation/rules in words.  Reflect on others’ justifications and use this to improve their work.  Edit and improve their own and a peer’s justification.  Investigate ‘what if?’ questions.  Create ‘what if? ‘questions |

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| **Year 5 Summer Term CFC** | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | |
| **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** |
| Count forwards and backwards, in any multiples up to 12, from zero or any other multiple, up to 12x12  Count up and down in decimals up to 3.d.p. | Count forwards and backwards, in any multiples up to 12, from zero or any other multiple, up to 12x12 | Use the recall of multiples of all times tables up to 12x12 and related division facts to recall new facts  Derive and recall what must be added to a decimal, with ones and tenths *(1.d.p.),* to make the next whole number *(7.2+?=8)*  Derive and recall doubles of decimals with ones and tenths and the corresponding halves *(Double 5.2, halve 10.4 and*  *Double 5.6, halve 11.2)*  Add decimals within 1 *(1.d.p.) (0.6 + 0.3)*  Subtract decimals within 1 *(1.d.p.) (0.8 – 0.2)* | Use the recall of multiples of all times tables up to 12x12 and related division facts to recall new facts | Derive and recall addition complements, for 1, using bonds to 100 to support (3.d.p.) *(0.735+0.265)*  Add decimals within 1 *(2.d.p.) (0.34 + 0.21)*  Subtract decimals within 1 *(2.d.p.) (0.34 – 0.21)*  Add decimals within 1 with mixed decimal places *(0.5 + 0.27)*  Subtract decimals within 1 with mixed decimal places *(0.5 – 0.21)*  Derive and recall addition doubles of decimals, with tenths *(1.d.p.) (5.2+5.2, 5.6+5.6 (bridging))*  Add near addition doubles of decimals, with ones and tenths (1.d.p.), with a difference of 0.1 *(partition,* double and adjust by 0.1)  Add any pairs of decimals with ones and tenths *(1.d.p.)* *(5.7+2.5)*  Subtract any pairs of decimals with ones and tenths *(1.d.p.) (6.3-4.8)*  Add decimals with mixed decimal places  Subtract decimal with mixed decimal places  Multiply a one-digit number, with up to 1.d.p., by a one-digit number *(0.8x7)*  Divide whole numbers by 10, 100 and 1000 (decimal number answers)  Multiply decimal numbers, by 10, 100 and 1000 (whole number answers)  Divide decimal numbers, by 10, 100 and 1000 (whole number answers)  Multiply decimal numbers, by 10, 100 and 1000 (decimal number answers)  Divide decimal numbers, by 10, 100 and 1000 (decimal number answers) | | Add decimals up to 3.d.p. and different number of decimal places using a formal written method *(column addition)*  Subtract decimals up to 3.d.p. and different number of decimal places using a formal written method *(column subtraction)* | |

**Year 6: Long Term Plan**

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| ***Y6*** | **1** | **2** | **3** | **4** | | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **TERM 1** | Counting, number & place value | | Addition, subtraction, multiplication & division | | | | | Fractions | | | | Position & direction | Properties of shape | | Statistics | |
| **TERM 2** | Decimals | | Percentages | | | Algebra | | Converting units | Perimeter, area & volume | | Ratio | |  |  | | |
| **TERM 3** | Problem solving & efficient strategies | | | | **Test Administration Window**  **May** | INVESTIGATIONS | | | | | | | | |  | |

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| **Year 6 Autumn Term Medium Term Planning** | | | | | | | | |
| **Concept** | **Counting, number & place value** | | | | | | | |
| **National Curriculum** | Use negative numbers in context, and calculate intervals across zero  Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit  Round any whole number to a required degree of accuracy  Solve problems which require answers to be rounded to specified degrees of accuracy  Solve number and practical problems that involve all of the above | | | | | | | |
| **White Rose Small Steps** | Numbers to ten million  Compare and order any number  Round any number  Negative numbers | | | | | | | |
| **Nrich** | Round the Four Dice \* P I | | | | | | | |
| **Question Bank** | **Spot the mistake:**  -80,-40,10,50 What is wrong with this sequence of numbers?  **True or False?**  When I count backwards in 50s from 10 I will say -200  **True or False?**  The temperature is -3. It gets 2 degrees warmer. The new temperature is -5?  **Do, then explain**  Find out the populations in five countries.  Order the populations starting with the largest. Explain how you ordered the countries and their populations.  **Do, then explain**  Show the value of the digit 6 in these numbers? 6787555 95467754 Explain how you know. | | **Make up an example** Create seven-digit numbers where the digit sum is six and the tens of thousands digit is two.  E.g. 4020000 What is the largest/smallest number?  **True or false?**  In all of the numbers below, the digit 6 is worth more than 6 hundredths.  3.6 3.063 3.006 6.23 7.761 3.076 Is this true or false? Change some numbers so that it is true.  What needs to be adde3d to 6.543 to give 7?  What needs to be added to 3.582 to give 5?  Circle the two decimals which are closest in value to each other. 0.9 0.09 0.99 0.1 0.01 | | | **Possible answers**  Two numbers each with two decimal places round to 23.1 to one decimal place. The total of the numbers is 46.2. What could the numbers be?  **What do you notice?**  Give an example of a six-digit number which rounds to the same number when rounded to the nearest 10000 and 100000  **Do, then explain**  Write the answer of each calculation rounded to the nearest whole number  75.7 × 59 7734 ÷ 60 772.4 × 9.7 20.34 × (7.9 – 5.4)  **What’s the same, what’s different?**  … when you round numbers to one decimal place and two decimal places? | | |
| **Curriculum Links** | Fractions  Ordering and understanding population size of different towns, cities, countries and continents gives a useful context for looking at larger numbers.  National newspapers and news programmes often provide statistics comparing values of money or other measures.  Temperature is often the easiest context through which to teach a good understanding of negative numbers.  The [**‘In Order’**](http://nrich.maths.org/7341) activity from Nrich requires children to consider and order the temperature, speed, volume and length of time taken for various different ‘real life’ activities | | | | | | | |
| **Concept** | **Addition & subtraction, multiplication & division** | | | | | | | |
| **National Curriculum** | Perform mental calculations, including with mixed operations and large numbers  Use their knowledge of the order of operations to carry out calculations involving the four operations  Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why  Multiply multi-digit number up to 4 digits by a 2-digit number using the formal written method of long multiplication.  Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context.  Divide numbers up to 4 digits by a 2-digit number using the formal written method of short division, interpreting remainders according to the context.  Identify common factors, common multiples and prime numbers.  Solve problems involving addition, subtraction, multiplication and division.  Use estimation to check answers to calculations and determine in the context of a problem, an appropriate degree of accuracy. | | | | | | | |
| **White Rose Small Steps** | Add and subtract whole numbers  Multiply up to a 4-digit number by 2-digit  Short division  Division using factors  Long division  Common factors  Common multiples  Primes  Squares and cubes  Order of operations  Mental calculations and estimation  Reason from known facts | | | | | | | |
| **Nrich** | [Exploring Number Patterns You Make](http://nrich.maths.org/8387) \*\* P I  [Become Maths Detectives](http://nrich.maths.org/6928) \* P I  Four Go \* G  [Mystery Matrix](http://nrich.maths.org/public/viewer.php?obj_id=1070) \*\* P I  [Factor Lines](http://nrich.maths.org/public/viewer.php?obj_id=1138) \*\* P I | | | | [Factor-multiple Chains](http://nrich.maths.org/public/viewer.php?obj_id=5578) \*\* P  [The Moons of Vuvv](http://nrich.maths.org/public/viewer.php?obj_id=1066) \* P  [Round and Round the Circle](http://nrich.maths.org/public/viewer.php?obj_id=86) \*\* P I  [Counting Cogs](http://nrich.maths.org/6966) \*\* P | | | |
| **Question Bank** | **True or false?**  Are these number sentences true or false?  6.32 + = 8 = 1.68 Give your reasons.  **Hard and easy questions**  Which questions are easy / hard?  213323 - 70 = 512893 + 37 = 8193.54 - 5.9 = Explain why you think the hard questions are hard?  **Missing symbols**  Write the missing signs ( + - x ÷) in this number sentence:  6 12.3 = 61.9 11.9  **What else do you know?**  If you know this: 86.7 + 13.3 = 100 what other facts do you know?  **Making an estimate**  Circle the number that is the best estimate to 932.6 - 931.05  1.3 1.5 1.7 1.9  **Always, sometimes, never**  Is it always, sometimes or never true that the sum of two consecutive triangular numbers is a square number | | **Use a fact**  12 x 1.1 = 13.2 Use this fact to work out 15.4 ÷ 1.1 = 27.5 ÷ 1.1 =  **Undoing**  I multiply a number with three decimal places by a multiple of 10. The answer is approximately 3.21  What was my number and what did I multiply buy?  When I divide a number by 1000 the resulting number has the digit 6 in the units and tenths and the other digits are 3 and 2 in the tens and hundreds columns. What could my number have been?  **Use the inverse**  Use the inverse to check if the following calculations are correct:  2346 x 46 = 332796 27.74 ÷ 19 = 1.46  **Size of an answer**  The product of a single digit number and a number with two decimal places is 21.34  What could the numbers be?  **Prove It** | | | What goes in the missing box?  18 4 ÷ 12 = 157 38 5 ÷ 18 = 212.5  33 2 ÷ 8 = 421.5 38 x .7 = 178.6    Prove it  **Can you find?**  Can you find the smallest number that can be added to or subtracted from 87.6 to make it exactly divisible by 8/7/18?  **Always, sometimes, never?**  Is it always, sometimes or never true that dividing a whole number by a half makes the answer twice as big?  Is it always, sometimes or never true that when you square an even number, the result is divisible by 4  Is it always, sometimes or never true that multiples of 7 are 1 more or 1 less than prime numbers?  **Which is correct?**  Which of these number sentences is correct?  3 + 6 x 2 =15 6 x 5 – 7 x 4 = 92 8 x 20 ÷ 4 x 3 = 37 | | |
| **Curriculum Links** | **Number and place value**  When working on addition and subtraction and/or number and place value there are opportunities to make connections between them, for example:  Finding temperature increases, decreases and differences, e.g. the temperature one Monday morning in January was -6.5°. It had risen by 9.5 degrees by lunchtime. What was the temperature at lunchtime?  Rounding numbers to the nearest tenth, one, ten etc. as an approximation of the answer to an addition or subtraction and also to check the solution, e.g. Bertie scored 2458 points on the computer game. Cindy scored 3856. How many points did they score altogether? (Rounding provides an approximation – i.e. 2500 + 3900 = 6400. So precise solution can be compared to approximate value for checking. ) How many more points did Cindy score? (Rounding provides an approximation – i.e. 3900 – 2500 = 1400. So, if precise answer is not close to 1400 it cannot be correct.)  **Measurement**  When working on addition and subtraction and/or measures there are opportunities to make connections between them, for example:  Finding totals and differences of different measurements, e.g. Kirsty cycled 25.75km, her brother cycled a further 4.125km. How far did her brother cycle? How far did they cycle altogether?  **Statistics**  When working on addition and subtraction and/or statistics there are opportunities to make connections between them, for example:  Making up and solving problems from a line graph, e.g. How many miles did the lorry driver travel between the end of the first hour and the end of the 6th hour?  **Algebra**  When working on addition and subtraction and/or algebra there are opportunities to make connections between them, for example:  Solving missing number problems by balancing each side so making use of the idea of equivalence, e.g.  2y-13 = y + 35  (add 13 to both) 2y -13 + 13 = y + 35 + 13  (calculate numerical elements) 2y = y + 48  (subtract y) y = 48  Solving number puzzles, e.g. write down five possible values of a + b in these equations:  • a + b = 8.75  •Learners will encounter addition and subtraction in:  Almost everything! Addition and subtraction are skills used in many problem-solving activities in subjects across the curriculum. | **Science**  Within the science curriculum there are opportunities to connect with addition and subtraction, for example in the introduction of the Upper Key Stage 2 Programme of Study it states that pupils should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. The children could, for example, interpret graphs and charts and find totals and differences in pieces of data, including measurement.  **Geography**  Within the geography curriculum there are opportunities to connect with addition and subtraction. In the introduction of the Key Stage 2 Programme of Study it states that pupils should extend their knowledge and understanding beyond the local area to include the United Kingdom and Europe, North and South America. This will include the location and characteristics of a range of the world’s most significant human and physical features. Children could, for example, find and compare distances between countries or cities, compare population statistics, temperatures, lengths of rivers, heights of mountains etc.  See, for example:   * [**Weather**](https://www.ncetm.org.uk/resources/34335) * [**Environments around the world**](https://www.ncetm.org.uk/resources/28569) * [**Mathematics and geography**](https://www.ncetm.org.uk/resources/28334)   **History**  Within the history curriculum, there are opportunities to connect with addition and subtraction, for example in the introduction of the Key Stage 2 Programme of Study it states that pupils should continue to develop a chronologically secure knowledge and understanding of British, local and world history, establishing clear narratives within and across the periods they study. The children could find differences between the duration of the different periods, such as the Stone Age and Iron Age or find the lengths of the reigns of different British monarchs.  The NCETM Primary Magazine provides some useful starting ideas for linking mathematics with [**the Romans.**](https://www.ncetm.org.uk/resources/29672)  a - b = 23 985  When working on multiplication and division and/or fractions there are opportunities to make connections between them, for example:  Multiply numbers such as:  245.25 by 10, 100 and 1000  1.35 by 8  ¼ x ½  Divide numbers such as:  12 578 by 10, 100 and 1000, 237 by 5, ⅓ ÷ 2 | | | **Ratio and proportion**  When working on multiplication and division and/or ratio and proportion there are opportunities to make connections between them, for example:  Convert the ingredients in this lasagne recipe for 4 people so that it will serve 12:  • 350g minced beef  • 1 onion  • 1 clove garlic  • 600g tin of tomatoes  • 2 tablespoons tomato puree  • 175g lasagne sheets  **Algebra**  When working on multiplication and division and/or algebra there are opportunities to make connections between them, for example:  Solve missing number problems, e.g. 6(a + 12) = 144  multiply out the equation: 6a + 72 = 144  balance by -72: 6a + 72 – 72 = 144 – 72  6a = 72  Use known division facts: a = 72 ÷ 6  a = 12  Find perimeters and areas of rectangles using the appropriate formulae, e.g. a square field has sides of 24.75m. What is its perimeter? What is its area?  **Measurement**  When working on multiplication and division and/or measurement there are opportunities to make connections between them by solving problems such as;  • 1 pint = 0.57 litres, how many litres in 8 pints? How many pints in 12 litres?  Dan was driving between two cities in France. The sign said the distance was 185km. He wanted to know what that was in miles. How can he find out? How many miles is it?  **Statistics**  When working on multiplication and division and/or statistics there are opportunities to make connections between them, for example:  Solve problems, e.g. find the mean monthly temperature for Reykjavik, Iceland  Monthly temperatures for Reykjavik  Jan Feb March April May June July Aug Sept Oct Nov Dec  -2°C -1°C 3°C 6°C 10°C 13°C 14°C 14°C 11°C 7°C 5°C -2°C | | | •  Learners will encounter multiplication and division in:  **Art & Design**  Within the art and design curriculum there are opportunities to connect with multiplication and division, for example in the introduction of the Key Stage 2 Programme of Study it states that pupils should be taught to develop their techniques, including their control and their use of materials, with creativity, experimentation and an increasing awareness of different kinds of art, craft and design. This could include designing and creating life size models of, for example a Barbara Hepworth sculpture or a Van Gogh painting where the children need to find realistic measurements and then scale them down using division.  **Geography**  Within the geography curriculum there are opportunities to connect with multiplication and division, for example in the introduction of the Key Stage 2 Programme of Study it states that pupils should extend their knowledge and understanding beyond the local area to include the United Kingdom and Europe, North and South America. This will include the location and characteristics of a range of the world’s most significant human and physical features. Work on multiplication and division could include converting between miles and kilometres and vice versa when looking at distances between countries or famous locations, making currency converters for pounds stirling and the currency in the country they are investigating.  See, for example:   * [**Mathematics and geography**](https://www.ncetm.org.uk/resources/28334)   **History**  Within the history curriculum, there are opportunities to connect with multiplication and division, for example in the introduction of the Key Stage 2 Programme of Study it states that ‘in planning to ensure the progression described above through teaching the British, local and world history outlined below, teachers should combine overview and depth studies to help pupils understand both the long arc of development and the complexity of specific aspects of the content’. The history curriculum requires that pupils should ‘compare aspects of life in different periods’, suggesting comparisons between Tudor and Victorian periods, for example. Scale models could be one way of learning about life in different periods.  See, for example:   * [**The Tudors**](https://www.ncetm.org.uk/resources/30319) * [**The Victorians**](https://www.ncetm.org.uk/resources/29053) * [**The Ancient Egyptians**](https://www.ncetm.org.uk/resources/30893) * [**The Ancient Greeks**](https://www.ncetm.org.uk/resources/34093) |
| **Concept** | **Fractions** | | | | | | | |
| **National Curriculum** | Compare and order fractions, including fractions >1  Use common factors to simplify fractions; use common multiples to express fractions in the same denomination  Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions  Multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. 1/4 × 1/2 = 1/8)  Divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6)  Generate and describe linear number sequences (with fractions)  Associate a fraction with division and calculate decimal fraction equivalents [ for example, 0.375] for a simple fraction [for example 1/8]  Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. | | | | | | | |
| **White Rose Small Steps** | Simplify fractions  Fractions on a number line  Compare and order (denominator)  Compare and order (numerator)  Add and subtract fractions  Add fractions  Subtract fractions  Mixed addition and subtraction  Multiply fractions by integers  Multiply fractions by fractions  Divide fractions by integers  Four rules with fractions  Fraction of an amount  Fraction of an amount–find the whole | | | | | | | |
| **Nrich** | Andy’s Marbles \*\* P | | | | | | | |
| **Question Bank** | Give an example of a **fraction** that is greater than 1.1 and less than 1.5.  Now another example that no one will think of. Explain how you know.  Sam put these fractions in order starting with the smallest. Are they in the correct order?  Thirty-three fifths Twenty-three thirds Forty-five sevenths How do you know?  **Odd one out**.  Which is the odd one out in each of these collections of 4 fraction  s¾ 9/12 26/36 18/24  4/20 1/5 6/25 6/30  Why?  **What do you notice?**  8/5 of 25 = 40 5/4 of 16 = 20 7/6 of 36 - 42  Can you write similar statements? | | **Complete the pattern**   |  |  |  |  | | --- | --- | --- | --- | | 1  8 | 2  8 | 3  8 | 4  8 | | 0.375 | ??? | ??? | ??? |   Complete the table.  **Another and another** Write a unit fraction which has a value of less than 0.5?  … and another, … and another, …  **Ordering**  Which is larger, 1/3 or 2/5? Explain how you know.  Put the following amounts in order, starting with the largest.  23%, 5/8, 3/5, 0.8 | | | | **Another and another**  Write down two fractions which have a difference of 1 2/… and another, … and another, …  **Another and another**  Write down2 fractions with a total of 3 4/5. … and another, … and another, …  **Continue the pattern**  1/3 ÷ 2 = 1/6 1/6 ÷ 2 = 1/12 1/12 ÷ 2 = 1/24  **What do you notice?**  ½ x ¼ =  **The answer is** 1/8 , what is the question (involving fractions / operations)  Give your **top tips** for dividing fractions. | |
| **Curriculum Links** | There are many connections and these need to be discussed with pupils. They need to see that fractions are numbers in their own right, and can, thus, be placed on a number line. They need to understand how fractions are linked to division – using both sharing and grouping. Also, the link to multiplication and finding factors, and that fractions express a relationship between 2 groups, e.g. 3 out of these 4, the proportion.  When shopping, children can compare prices presented in decimal form. Consider reductions in price when the reduction is given as a fraction (e.g. ‘one third off’) or percentage (‘20% off today’). Sharing the cost of a total bill equally in a restaurant provides a useful context in which to practise estimation of fractions as well as calculating. | | | | Fractions skills can be also emphasised when focusing on measurement. Journey times and fuel consumption can be estimated and calculated (e.g. what fraction of the journey do we have remaining?) Measurement of area and perimeter is strongly linked to work with fractions, ratio and proportion; what proportion of the playground needs to be set aside for ball games?  When interpreting and evaluating data children will need to use their fraction knowledge. E.g. Half a million people are earning 20% below the minimum wage  [**Issue 11**](https://www.ncetm.org.uk/resources/16792) of the NCETM Primary Magazine provides wonderful links to the work of artist Mondrian, with a focus on fractions and decimal work | | | |
| **Concept** | **Position & direction** | | | | | | | |
| **National Curriculum** | Describe positions on the full coordinate grid (all four quadrants)  Draw and translate simple shapes on the coordinate plane and reflect them in the axes. | | | | | | | |
| **White Rose Small Steps** | The first quadrant  Four quadrants  Translations  Reflections | | | | | | | |
| **Nrich** | [Cops and Robbers](http://nrich.maths.org/public/viewer.php?obj_id=6288) \* G  [Eight Hidden Squares](http://nrich.maths.org/public/viewer.php?obj_id=6280) \*\* P  [Coordinate Tan](http://nrich.maths.org/public/viewer.php?obj_id=1109) \*\* P  [Ten Hidden Squares](http://nrich.maths.org/public/viewer.php?obj_id=2654) \*\*\* P | | | | | | | |
| **Question Bank** | **Working backwards**  Two triangles have the following co-ordinates:  Triangle A: (3, 5) (7, 5) (4, 7)  Triangle B: (3, 1) (7, 1) (4, 3)  Describe the translation of triangle A to B and then from B to A. | | | | | | | |
| **Curriculum Links** | In geography, learners will encounter coordinates through map work.  In Design & Technology, learners may be required to use their knowledge of translation, in particular, scaling up and down.  Coordinates and translation may also be used when designing rooms, planning buildings and floor layouts, or when scaling drawings or patterns in Art & Design. | | | | | | | |
| **Concept** | **Geometry: properties of shapes** | | | | | | | |
| **National Curriculum** | Draw 2-D shapes using given dimensions and angles  Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons  Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles | | | | | | | |
| **White Rose Small Steps** | Measure with a protractor  Introduce angles  Calculate angles  Vertically opposite angles  Angles - triangles  Angles – special cases  Find missing angles  Angles - quadrilaterals  Angles – regular polygons  Draw shapes  Draw nets | | | | | | | |
| **Nrich** | [Cut Nets](http://nrich.maths.org/public/viewer.php?obj_id=2315) \*\* P  [Making Cuboids](http://nrich.maths.org/public/viewer.php?obj_id=90) \*\* P I  [Where Are They?](http://nrich.maths.org/public/viewer.php?obj_id=1058) \* P  [Quadrilaterals](http://nrich.maths.org/public/viewer.php?obj_id=962) \*\*\* P I | | | | [Round a Hexagon](http://nrich.maths.org/8095) \* P  [Making Spirals](http://nrich.maths.org/8294) \*\*\* P  [Shape Draw](https://nrich.maths.org/10368) \* P  [Baravelle](http://nrich.maths.org/6522) \* P | | | |
| **Question Bank** | **What’s the same, what’s different?** What is the same and what is different about the nets of a triangular prism and a square based pyramid?  **Visualising**  Jess has 24 cubes which she builds to make a cuboid. Write the dimensions of cuboids that she could make.  List all the possibilities.  **Always, sometimes, never**  Is it always, sometimes or never true that, in a polyhedron, the number of vertices plus the number of faces equals the number of edges?  **Other possibilities**  Not to scale  The angle at the top of this isosceles triangle is 110 degrees.  What are the other angles in the triangle? | | | | **Other possibilities**  If one angle of an isosceles triangle is 36 degrees.  What could the triangle look like – draw it.  Are there other possibilities.  Draw a net for a cuboid that has a volume of 24 cm3.  **Convince me**  One angle at the point where the diagonals of a rectangle meet is 36 degrees.  What could the other angles be? Convince me | | | |
| **Curriculum Links** | When solving practical problems, there are many links to be made between geometry, measures and elements of number and place value. Calculating percentages of angles, e.g. 15% of a circle, of 25% of 360˚ can bring the two mathematical strands together.  Shapes of given properties can be translated, rotated and reflected, and positions described on the full 4-quadrant coordinate grid. Measurement skills can be used to define scale factors between similar shapes, and to calculate areas of parallelograms and triangles.  Learners will encounter properties of shape in:  **The world around them** – using their ability to recognise and describe 3-D shapes used in building houses, packaging used by supermarkets and storage boxes used in and around the home.  **Design and Technology** – using an ability to draw 2-D shapes using given dimensions and angles to make and construct technology projects. Building simple and more complex 3-D shapes using plastic toy construction materials as an example. | | | | **Physical Education** – e.g. in orienteering, pupils use knowledge of angles to find clues and use an understanding of properties of shapes to solve problems.  **ICT**- use of programming technology to design sequences, using knowledge of angles, to compare and classify geometric shapes based on their properties. Pupils use knowledge of angles to support program writing and building of 3-D models.  **History** – Pyramids and obelisks – using plasticine or modelling equipment to build models and gain an understanding of the faces and angles used in building 3-D shapes used throughout history.  **Art** – the NCETM Primary Magazine provides many useful links for looking at shape within art. [**Issue 34**](https://www.ncetm.org.uk/resources/38454) provides some useful starting points, using the snail work of Matisse as a stimulus. | | | |
| **Concept** | **Statistics** | | | | | | | |
| **National Curriculum** | Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius  Interpret and construct pie charts and line graphs and use these to solve problems  Calculate the mean as an average | | | | | | | |
| **White Rose Small Steps** | Read and interpret line graphs  Draw line graphs  Use line graphs to solve problems  Circles  Read and interpret pie charts  Pie charts with percentages  Draw pie charts  The mean | | | | | | | |
| **Nrich** | [Match the Matches](http://nrich.maths.org/public/viewer.php?obj_id=4937) \*\* P  [Birdwatch](http://nrich.maths.org/7553) \* I  [Probably …](http://nrich.maths.org/7245) \* P  [Odds or Sixes?](http://nrich.maths.org/public/viewer.php?obj_id=2859) \* G | | | | [Same or Different?](http://nrich.maths.org/public/viewer.php?obj_id=1176) \*\* G  [Tricky Track](http://nrich.maths.org/public/viewer.php?obj_id=2150) \*\* G  [Winning the Lottery](http://nrich.maths.org/7244) \*\* P | | | |
| **Question Bank** | **True or false?**  (Looking at a pie chart) “More than twice the number of people say their favourite type of T.V. programme is soaps than any other”  **Is this true or false?**  **Convince me.**  Make up your own ‘true/false’ statement about the pie chart. | | | | **What’s the same, what’s different?**  Pupils identify similarities and differences between different representations and explain them to each other  **Create a questions** Make up a set of five numbers with a mean of 2.7  **Missing information** The mean score in six test papers in a spelling test of 20 questions is 15.Five of the scores were13 12 17 18 16What was the missing score? | | | |
| **Curriculum Links** | The construction of pie charts will provide an essential link with work on angles and fractions, as well as calculation.  The use of conversion graphs when carrying out work on line graphs provides a nice link to converting different units of measure.  When carrying out measuring activities in the classroom, it is likely that the mean average will be useful. | | | There are many, many examples of ‘real life’ situations where a wealth of data needs to be digested, sorted, presented or interpreted. Websites such as ‘Stats4Schools’, the content of which is now hosted by the National Stem Centre, has a large number of ‘real’ datasets’ that children could use in other curriculum areas. ‘Census at School’ also provides a vast bank of data resources that can be utilised in the classroom.  Geographical data and information based on other regions and countries can provide a good context for statistics work.  Measurements and readings recorded in science lessons, e.g. of sound levels, temperature, plant height etc, can all be used as datasets for statistics work in mathematics. | | | | |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required.  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate.  Make suggestions of ways to solve a range of problems.  Organise work from the outset, looking for ways to record and work systematically.  Find and predict possibilities that match the context using patterns spotted to support.  Independently check and improve their work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve).*  Pattern spot and begin to express generalisations/proof using words and symbolic notation.  Make and investigate conjectures and provide examples and counter-examples.  When they have solved a problem, pose a similar problem for a peer. | Provide proof of reasoning, expressing generalisations in words and symbolic notation.  Reflect on others’ proof and use this to improve their own work.  Edit and improve their own and a peer’s proof.  Investigate ‘what if?’ questions.  Create ‘what if?’ questions. |

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| **Year 6 Autumn Term CFC** | | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | | |
| **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | **Autumn Term 1** | **Autumn Term 2** | |
| Count forwards or backwards in steps of powers of 10 for any given number up to 10 000 000  Count forwards and backwards across zero using negative numbers | Count forwards and backwards using fractions | Use the recall of multiples of all times tables up to 12x12 and related division facts to recall new facts  Recall prime numbers up to 19 *(2, 3, 5, 7, 11, 13, 17, 19)*  Recall squares to 12 x 12  Recall cube numbers  Recall squares to 12 x 12 and the corresponding multiples of 10 *(60x60=3600)* | Derive and recall doubles of increasingly larger whole and decimal numbers and the corresponding halves *(double 15.42, halve 30.84)*  Derive and recall addition doubles for multiples of 10, 100 and 1000 with increasing larger numbers  Recall fraction, decimal and % equivalents | Add any near multiple for increasing larger numbers  Subtract any near multiple for increasing larger numbers | Multiply pairs of multiples of 10 and 100 *(600x30)*  Divide multiples of 100 by a multiple of 10 or 100 *(whole number answers) (600÷20, 800÷400, 2100÷300)*  Multiply numbers, up to 1000, by a one-digit number *(467x3)*  Divide by 25, using ÷100 and double and double again *(480÷25 = (480÷100)x4 or (480÷4)x100)*  Divide by 50, using ÷100 and double *(480÷50 =(480÷100)x2 or (480x2)÷100*  *Or ÷5 and ÷10 e.g.*  *440÷50 = (440÷5)÷10 or (440÷10)÷5)* | Add whole numbers, using a formal written method *(column addition)*  Subtract whole numbers, using a formal written method *(column subtraction)* | | Multiply a 4 digit by a two-digit using a formal written method *(long multiplication)*  Divide a 4 digit by a two-digit using a formal written method *(short division)* and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context.  Divide a 4 digit by a two-digit using a formal written method *(long division)* and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context. |

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| **Year 6 Spring Term Medium Term Planning** | | | | | |
| **Concept** | **Decimals** | | | | |
| **National Curriculum** | Identify the value of each digit in numbers given to three decimal places  Solve problems which require answers to be rounded to specified degrees of accuracy  Multiply one-digit numbers with up to two decimal places by whole numbers  Multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places  Use written division methods in cases where the answer has up to two decimal places | | | | |
| **White Rose Small Steps** | Three decimal places  Multiply by 10, 100 and 1,000  Divide by 10, 100 and 1,000  Multiply decimals by integers  Divide decimals by integers  Division to solve problems  Decimals as fractions  Fractions to decimals | | | | |
| **Nrich** |  | | | | |
| **Question Bank** | Give an example of a **fraction** that is greater than 1.1 and less than 1.5.  Now another example that no one will think of. Explain how you know.  **Making links**  0.7 x 8 = 5.6 How can you use this fact to solve these calculations?  0.7 x 0.08 = 0.56 ÷ 8 =  **Complete the pattern**   |  |  |  |  | | --- | --- | --- | --- | | 1  8 | 2  8 | 3  8 | 4  8 | | 0.375 | ??? | ??? | ??? |   Complete the table. | | | **Another and another** Write a unit fraction which has a value of less than 0.5?  … and another, … and another, …  **Ordering**  Which is larger, 1/3 or 2/5? Explain how you know.  Put the following amounts in order, starting with the largest.  23%, 5/8, 3/5, 0.8 | |
| **Curriculum Links** | [**Issue 11**](https://www.ncetm.org.uk/resources/16792) of the NCETM Primary Magazine provides wonderful links to the work of artist Mondrian, with a focus on fractions and decimal work. | | | | |
| **Concept** | **Percentages** | | | | |
| **National Curriculum** | Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts  Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison | | | | |
| **White Rose Small Steps** | Fractions to percentages  Equivalent FDP  Percentage of an amount  Percentages – missing values  Percentage increase and decrease  Order FDP | | | | |
| **Nrich** |  | | | | |
| **Question Bank** |  | | | | |
| **Curriculum Links** | When shopping, children can compare prices presented in decimal form. Consider reductions in price when the reduction is given as a fraction (e.g. ‘one third off’) or percentage (‘20% off today’). Sharing the cost of a total bill equally in a restaurant provides a useful context in which to practise estimation of fractions as well as calculating.  Fractions skills can be also emphasised when focusing on measurement. Journey times and fuel consumption can be estimated and calculated (e.g. what fraction of the journey do we have remaining?) Measurement of area and perimeter is strongly linked to work with fractions, ratio and proportion; what proportion of the playground needs to be set aside for ball games?  When interpreting and evaluating data children will need to use their fraction knowledge. E.g. Half a million people are earning 20% below the minimum wage | | | | |
| **Concept** | **Algebra** | | | | |
| **National Curriculum** | Use simple formulae  Generate and describe linear number sequences  Express missing number problems algebraically  Find pairs of numbers that satisfy an equation with two unknowns  Enumerate possibilities of combinations of two variables | | | | |
| **White Rose Small Steps** | Find a rule – one step  Find a rule – two step  Use an algebraic rule  Substitution  Formulae  Word Problems  Solve simple one step equations  Solve two step equations  Find pairs of values  Enumerate possibilities | | | | |
| **Nrich** | [Domino Sets](https://nrich.maths.org/9965) \* P I  [Plenty of Pens](https://nrich.maths.org/1117) \* P | | | | |
| **Question Bank** | **Connected Calculations**  p and q each stand for whole numbers. p + q = 1000 and p is 150 greater than q. Work out the values of p and q.  **Undoing**  The diagram below represents two rectangular fields that are next to each other.   |  |  | | --- | --- | | Field A | Field B |   Field A is twice as long as field B but their widths are the same and are 7.6 metres. If the perimeter of the small field is 23m what is the perimeter of the entire shape containing both fields?  If y stands for a number complete the table below   |  |  |  | | --- | --- | --- | | *y* | 3*y* | 3*y* + 1 | | 25 |  |  | |  |  | 28 |   What is the largest value of y if the greatest number in the table was 163? | | **Generalising**  Write a formula for the 10th, 100th and nth terms of the sequences below.  4, 8, 12, 16 ………  0.4, 0.8, 1.2, 1.6, …….. | | |
| **Curriculum Links** | Learners will encounter algebra in:  Recipes or formulae such as: Child’s dose = Age × Adult dose  Age + 12  or F = 9⁄5 C + 32  Working out the reading age of a particular text – e.g.  where N is the number of one-syllable words in a passage of 150 words.   * FORECAST formula   forecast formula | | * FOG index   forecast formula  where A = no. of words in passage  n = no. of sentences  L = no. of words containing 3 or more syllables (excluding the'-ing' and 'ed' endings).  More information on reading age formulae, can be found [**here**](http://www.cimt.plymouth.ac.uk/resources/topical/reading/reading.htm) | | |
| **Concept** | **Converting units** | | | | |
| **National Curriculum** | Solve problems involving the calculation and conversion of **units of measure**, using decimal notation up to three decimal places where appropriate  Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places  Convert between miles and kilometres | | | | |
| **White Rose Small Steps** | Metric measures  Convert metric measures  Calculate with metric measures  Miles and kilometres  Imperial measures | | | | |
| **Nrich** |  | | | | |
| **Question Bank** | **The answer is ….**  24 metres cubed  What is the question?  **What do you notice?**8 km = 5 miles  16km = miles  4 km = miles  Fill in the missing number of miles.  Write down some more facts connecting kilometres and miles. | | | | |
| **Curriculum Links** | Within mathematics, pupils can connect the conversion of units of measurement (for example, from kilometres to miles) to a graphical representation as preparation for understanding linear/proportional graphs. They should know approximate conversions and should able to tell if an answer is sensible.  When focusing on measuring temperature, pupils should make use of the number line to add and subtract positive and negative integers  In geography, children will learn of other countries around the world, their climate, landscape and traditions. Map work involves the use of scale, and conversion between measurements. Children could convert between pounds Sterling and currencies of these other countries, using formulae or straight line conversion graphs. | | | | |
| **Concept** | **Perimeter, area & volume** | | | | |
| **National Curriculum** | Recognise that shapes with the same areas can have different perimeters and vice versa  Recognise when it is possible to use formulae for area and volume of shapes  Calculate the area of parallelograms and triangles  Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm3, m3 and extending to other units (mm3, km3) | | | | |
| **White Rose Small Steps** | Shapes – same area  Area and perimeter  Area of a triangle  Area of a parallelogram  Volume – counting cubes  Volume of a cuboid | | | | |
| **Nrich** | [Dicey Perimeter, Dicey Area](https://nrich.maths.org/10333) \* G  Next Size Up \*\* P | | | | |
| **Question Bank** | **Other possibilities**  (links with geometry, shape and space)  A cuboid has a volume between 200 and 250 cm cubed.  Each edge is at least 4cm long. List four possibilities for the dimensions of the cuboid.  **Testing conditions**  A square has the perimeter of 12 cm. When 4 squares are put together, the perimeter of the new shape can be calculated.  For example:  What arrangements will give the maximum perimeter? | | **Always, sometimes, never**  The area of a triangle is half the area of the rectangle that encloses it: | | |
| **Curriculum Links** | Calculations of area and perimeter are often used when decorating rooms (for carpet, paint, skirting board etc.) or a garden (circular/square pond area, lawn area, perimeter fencing etc) | | | | |
| **Concept** | **Ratio** | | | | |
| **National Curriculum** | Solve problems involving the relative sizes of two quantities where missing values can be found by  using integer multiplication and division facts  Solve problems involving similar shapes where the scale factor is known or can be found  Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples | | | | |
| **White Rose Small Steps** | Using ratio language  Ratio and fractions  Introducing the ratio symbol  Calculating ratio  Using scale factors  Calculating scale factors  Ratio and proportion problems | | | | |
| **Nrich** | Orange Drink \*\* P  Pumpkin Pie Problem \*\* P  Jumping \* P  Would you Rather? \* P | | | | |
| **Question Bank** | **What else do you know?**  In a flower bed a gardener plants 3 red bulbs for every 4 white bulbs. How many red and white bulbs might he plant?  If she has 100 white bulbs, how many red bulbs does she need to buy?  If she has 75 red bulbs, how many white bulbs does she need to buy?  If she wants to plant 140 bulbs altogether, how many of each colour should she buy?  **Do, then explain**  Purple paint is made from read and blue paint in the ratio of 3:5. To make 40 litres of purple paint how much would I need of each colour? Explain your thinking.  **What else do you know?**  88% of a sum of money = £242. Make up some other statements. Write real life problems for your number sentences. | | **Undoing**  I think of a number and then reduce it by 15%. The number I end up with is 306. What was my original number?  In a sale where everything is reduced by 15% I paid the following prices for three items. £255, £850, £4.25 What was the original selling price?  **Unpicking**  A recipe needs to include three times as much apple than peach. The total weight of apples and peaches in a recipe is 700 grammes. How much apple do I need?  **Other** **possibilities**  A 50 seater coach travels to the match. Most of the seats are taken. Junior tickets cost £13 and Adult tickets cost £23. The only people on the coach are Juniors and Adults. The total amount paid for tickets is approximately £900 How many people on the coach were adults and how many were juniors? | | |
| **Curriculum Links** | **Number – Fractions**  When working on ratio and proportion and/or fractions, including decimals and percentages, there are opportunities to make connections between them, for example:  In the same way that fractions describe the relationship between parts of a whole and the whole of which they are a part, proportion also expresses the relationship between parts and wholes. Ratio, on the other hand, describes the relationships between parts. When working with ratio, the whole can be inferred by understanding the total number of parts. In turn, once the total number of parts is known, any number of those parts can be expressed as a fraction or proportion of the whole. It is helpful to work through an example: imagine 10 counters of which 4 are red and 6 are blue. When comparing the red with the blue, we see that there are 4 red for every 6 blue; the ratio is 4:6. This can be simplified to 2:3. Proportion is usually represented as a fraction. Four out of ten counters are red, so, 4/10 are red. Six out of ten counters are blue, so, 6/10 are blue. These fractions can be simplified to ⅖ and ⅗. You can practise this with the children using counters, interlocking links or cubes or a collection of classroom items, for example, 8 pencils and 4 rubbers. 8⁄12 of the collection are pencils, this fraction can be simplified to ⅔. 4⁄12 are rubbers, this can be simplified to ⅓. Simplifying fractions covers the first objective in the above list.  The fractions made can also be converted to decimals and percentages, for example 0.4 or 40% of the counters are red and 0.6 or 60% of the counters are blue. 0.3 of 30% of the collection are pencils and 0.7 or 70% are rubbers.  Using the ITP Fractions gives opportunities to visually make comparisons between fractions, decimals, ratio and proportion.  Ratio and proportion is another ITP worth exploring with the children. In this ITP you can demonstrate comparisons between different ratios and proportions with volumes of liquids.  **Number-Multiplication and division**  When working on ratio and proportion and/or multiplication and division there are opportunities to make connections between them, for example: | Scaling an object or an amount down by multiplying by a fraction, for example, if sketching a tree or building in the school’s grounds, the height would need to be scaled down. You could ask the children to make an estimate of the height of the object by walking away from it until, when they bend down they can see its top from between their legs. They put a marker at this point and then measure from the marker to the base of the object. This will give a reasonable estimate of its height because the child will be looking at the top of the tree at an angle of approximately 45 degrees if viewed in this way. Therefore, the height of the tree will be the same as the distance from it. To make a sketch, this measurement needs to be scaled down. For example, if it was 10m tall and they wanted to make a scale drawing showing the tree as 1m high, they would need to draw the tree at a scale of 1:10 (or multiply the height of the tree by a scale factor of 1/10).  Children could draw classroom objects to scale. For example, the height of a table measuring 50cm could be scaled down to (multiplied by scale factor) 1/5 to make the table10cm in the drawing.  **Statistics**  When working on ratio and proportion and/or statistics there are opportunities to make connections between them, for example:  Using the ITP Data Handling is an effective way to explore comparisons using a pie chart. In the example below, the children could estimate the percentages of people of different ages and compare them. They could present the information as proportions using fraction and/or decimals. They could compare data as ratios, for example the ratio of those under 20 to those between 20 and 50 is 1:2.  Learners will encounter ratio and proportion:  Within the science curriculum there are opportunities to work with ratio and proportion. For example, pupils should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. The children could, for example, construct pie charts or use ratio and proportion to compare groupings and classifications or the results of tests that they carry out. | | | Within the geography curriculum there are opportunities to connect with ratio and proportion, for example in the introduction of the Key Stage 2 Programme of Study it states that pupils should extend their knowledge and understanding beyond the local area to include the United Kingdom and Europe, North and South America. This will include the location and characteristics of a range of the world’s most significant human and physical features. Children could, for example, find and compare distances between countries or cities, compare population statistics, temperatures, lengths of rivers, heights of mountains. The results of any comparisons could be displayed in a pie chart.  See, for example:  Weather  Environments around the world  Mathematics and geography  There are also opportunities to work with ratio and proportion, linked to history, for example, ‘pupils should continue to develop a chronologically secure knowledge and understanding of British, local and world history, establishing clear narratives within and across the periods they study. The children could, for example, represent the lengths of the different periods in history and the rules of different British monarchs using pie charts’ (History Programme of Study). This would enable them to make comparisons using proportion as fractions or percentages.  See, for example:  The Victorians  The Romans |

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| **Problem Solving** | **Reasoning** |
| Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)*  Independently choose to scaffold thinking using concrete, pictorial or abstract representations, if required.  Independently choose to represent thinking using concrete, pictorial or abstract representations, as appropriate.  Make suggestions of ways to solve a range of problems.  Organise work from the outset, looking for ways to record and work systematically.  Find and predict possibilities that match the context using patterns spotted to support.  Independently check and improve their work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve).*  Pattern spot and begin to express generalisations/proof using words and symbolic notation.  Make and investigate conjectures and provide examples and counter-examples.  When they have solved a problem, pose a similar problem for a peer. | Provide proof of reasoning, expressing generalisations in words and symbolic notation.  Reflect on others’ proof and use this to improve their own work.  Edit and improve their own and a peer’s proof.  Investigate ‘what if?’ questions.  Create ‘what if?’ questions. |

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| **Year 6 Spring Term CFC** | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | |
| **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** | **Spring Term 1** | **Spring Term 2** |
| Count up and down in decimals up to 3.d.p. | | Use the recall of multiples of all times tables up to 12x12 and related division facts to recall new facts  Recall ‘0.1, 0.01 and 0.001 more’ facts, with numbers up to 3.d.p.  Recall ‘0.1, 0.01 and 0.001 less facts, with numbers up to 3.d.p.  Derive and recall addition facts, within 0.1 and 0.01, using bonds to 10 to support *(0.02+0.08, 0.43+0.27)*  Derive and recall what must be added to a decimal, with ones, tenths and hundredths (2.d.p.), to make the next whole number *(7.26 +? = 8)* | Recall fraction, decimal and % equivalents | Derive and recall sums and differences of decimals with ones and tenths and hundredths *(2.d.p) (6.54+2.71, 7.86–1.32)*  Derive and recall addition doubles of decimals, with tenths and hundredths *(2.d.p)* *(5.21+5.21, 5.28+5.28 (bridging), 5.62+5.62 (bridging), 5.68+5.68 (bridging))*  Add near addition doubles of decimals, with ones, tenths and hundredths *(2.d.p.),* with a difference of 0.01  *(Partition, double and adjust by 0.1)*  Add any pair of decimals with ones, tenths and hundredths (2.d.p.) (0.7+3.38)  Subtract any pair of decimals with ones, tenths and hundredths (*2.d.p.) (3.38 – 0.7)*  Add a decimal with ones and tenths, that is nearly a whole number *(4.3+2.9 (4.3+3-0.1)*  Subtract a decimal with ones and tenths, that is nearly a whole number *(4.3-2.9 (4.3-3+0.1)*  Divide whole numbers by 10, 100 and 1000 *(decimal number answers)*  Multiply decimal numbers, by 10, 100 and 1000 *(whole number answers)*  Divide decimal numbers, by 10, 100 and 1000 *(whole number answers)*  Multiply decimal numbers, by 10, 100 and 1000 *(decimal number answers)*  Divide decimal numbers, by 10, 100 and 1000 *(decimal number answers)*  Multiply one-digit numbers, with up to 2.d.p., by a one-digit number *(0.84x7)*  Divide decimal numbers, to 1.d.p., by a one-digit number *(4.8÷6)* | | Multiply a 4 digit by a two-digit using a formal written method *(long multiplication)*  Divide a 4 digit by a two-digit using a formal written method *(short division*) and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context.  Divide a 4 digit by a two-digit using a formal written method *(long division)* and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context. | Add decimals up to 3.d.p., using a formal written method *(column addition)*  Subtract decimals up to 3.d.p., using a formal written method *(column subtraction)* |

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| **Year 6 Summer Term CFC** | | | | | | | | |
| **Counting** | | **Fact Recall** | | **Mental Calculation** | | **Formal Methods of Calculation** | | |
| **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | **Summer Term 2** | **Summer Term 1** | | **Summer Term 2** |
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