NRICH [http://nrich.maths.org] Problems Linked to the Primary National Curriculum for Mathematics in Years 3, 4, 5 and 6

NRICH tasks embrace the aims of the curriculum (problem solving, reasoning and fluency) as well as curriculum 'content' (further information).

The stars indicate the level of confidence and competence needed to begin the activity. One star problems will be suitable for the whole class, two stars for the majority and three stars for those who like a serious challenge.

The activity listings now include what type of activity they are: games are indicated by 'G', problems by 'P' and investigations by 'I'.

N.B. This is work in progress – we would really appreciate your comments. Please email [emp1001@cam.ac.uk](mailto:emp1001@cam.ac.uk)

<table>
<thead>
<tr>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strand 1 – Number</strong></td>
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<td><strong>Strand 1 – Number</strong></td>
</tr>
<tr>
<td>Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number</td>
<td>Count in multiples of 6, 7, 9, 25 and 1000</td>
<td>Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</td>
<td>Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit</td>
</tr>
<tr>
<td><strong>NRICH:</strong> How Would We Count? * P **</td>
<td><strong>NRICH:</strong> Coded Hundred Square * P **</td>
<td><strong>NRICH:</strong> Which Scripts? * P **</td>
<td><strong>NRICH:</strong> First Connect Three * G P **</td>
</tr>
<tr>
<td>Recognise the place value of each digit in a three-digit number</td>
<td>Find 1000 more or less than a given number</td>
<td>Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</td>
<td>Round any whole number to a required degree of accuracy</td>
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<td>(hundreds, tens, ones)</td>
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<tr>
<td><strong>NRICH:</strong> Coded Hundred Square * P **</td>
<td><strong>NRICH:</strong> Which Scripts? * P **</td>
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<tr>
<td>Compare and order numbers up to 1000</td>
<td>Count backwards through zero to include negative numbers</td>
<td>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero</td>
<td>Use negative numbers in context, and calculate intervals across zero</td>
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<td><strong>NRICH:</strong> Tug Harder! * G **</td>
<td><strong>NRICH:</strong> First Connect Three * G P **</td>
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<td><strong>NRICH:</strong> Swimming Pool* P **</td>
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<td><strong>NRICH:</strong> Sea Level * P I **</td>
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<tr>
<td>Identify, represent and estimate numbers using different representations</td>
<td>Recognise the place value of each digit in a four-digit number</td>
<td>Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</td>
<td>Solve number and practical problems that involve all of the above</td>
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<tr>
<td></td>
<td>(thousands, hundreds, tens and ones)</td>
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<td><strong>NRICH:</strong> Round the Four Dice * P I **</td>
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<tr>
<td><strong>NRICH:</strong> Nice or Nasty * G **</td>
<td><strong>NRICH:</strong> Dicey Operations * G **</td>
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<tr>
<td><strong>NRICH:</strong> The Deca Tree * P **</td>
<td><strong>NRICH:</strong> Four-digit Targets * P **</td>
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</tbody>
</table>
| Number and Place Value

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To make sure this document displays correctly in Word 2000, click on the Table menu, choose Table Properties and then select the option which has no text wrapping
Read and write numbers up to 1000 in numerals and in words

Order and compare numbers beyond 1000

Solve number problems and practical problems that involve all of the above

Identify, represent and estimate numbers using different representations

Read Roman numerals to 1000 (M) and recognise years written in Roman numerals

Round any number to the nearest 10, 100 or 1000

NRICH: Reasoned Rounding * G

Solve number and practical problems that involve all of the above and with increasingly large positive numbers

Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)

NRICH: Take Three Numbers * I

NRICH: Three Neighbours ** I

NRICH: Square Subtraction *** I

NRICH: Planning a School Trip * p

NRICH: Magic Vs ** P

NRICH: Number Differences * G P

NRICH: Sitting Round the Party Tables * P

NRICH: Number Match * G

NRICH: A Mixed-up Clock * P

NRICH: That Number Square! * I

Identify, represent and estimate numbers using different representations

Solve number problems involving these ideas

NRICH: Take Three Numbers * I

NRICH: Three Neighbours ** I

NRICH: Square Subtraction *** I

NRICH: Planning a School Trip * p

NRICH: Magic Vs ** P

NRICH: Number Differences * G P

NRICH: Sitting Round the Party Tables * P

NRICH: Number Match * G

NRICH: A Mixed-up Clock * P

NRICH: That Number Square! * I

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 4 digits using the formal written methods of columnar addition and subtraction where appropriate

Addition and Subtraction
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

Estimate and use inverse operations to check answers to a calculation

Add and subtract numbers mentally with increasingly large numbers

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

Estimate and use inverse operations to check answers to a calculation

Add and subtract numbers mentally with increasingly large numbers

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

Estimate and use inverse operations to check answers to a calculation

Add and subtract numbers mentally with increasingly large numbers

NRICH: ** Money Bags ** P
NRICH: ** Amy's Dominoes ** P
NRICH: Fifteen Cards * P I
NRICH: ** Sealed Solution ** P
NRICH: Roll These Dice ** I

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NRICH: ** Amy's Dominoes ** P
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NRICH: Roll These Dice ** I
Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

NRICH: Ordering Cards * G P
NRICH: Music to My Ears * P I

Recall multiplication and division facts for multiplication tables up to 12x12

NRICH: Multiplication Square Jigsaw * G P
NRICH: Shape Times Shape * P
NRICH: Table Patterns Go Wild! ** I
NRICH: Let Us Divide! * P
NRICH: Carrying Cards * P
NRICH: Light the Lights Again * G P
NRICH: Multiples Grid * I
NRICH: Zios and Zepts * P
NRICH: Times Tables Shifts * G P

Identify multiples and factors, including all factor pairs of a number, and common factors of two numbers

NRICH: Sweets in a Box * P I
NRICH: Which Is Quicker? * P
NRICH: Multiplication Squares * P I
NRICH: Flashing Lights * P
NRICH: Abundant Numbers * I
NRICH: Factor Track ** G P
NRICH: Factors and Multiples Game * G
NRICH: Pebbles ** I

Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

Multiplication and Division

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

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

Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers

Divide numbers up to 4 digits by a two-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

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

NRICH: A Square of Numbers * G P
NRICH: What do you Need? * P
NRICH: This Pied Piper of Hamelin ** P
NRICH: Follow the Numbers * P I
NRICH: What’s In The Box? * P
NRICH: How Do You Do It? * P
NRICH: Ip Dip * I
NRICH: Journeys in Numberland * I

Recognise and use factor pairs and commutativity in mental calculations

Establish whether a number up to 100 is prime and recall prime numbers up to 19

Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context

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| Multiply two-digit and three-digit numbers by a one-digit number using formal written layout | Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers | Perform mental calculations, including with mixed operations and large numbers  
NRICH: Exploring Number Patterns You Make ** P I  
NRICH: Become Maths Detectives * P I |
|---|---|---|
| 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 | Multiply and divide numbers mentally drawing upon known facts | Identify common factors, common multiples and prime numbers  
NRICH: Mystery Matrix ** P I  
NRICH: Factor Lines ** P I  
NRICH: Factor-multiple Chains ** P  
NRICH: The Moons of Vuvv * P  
NRICH: Round and Round the Circle ** P I  
NRICH: Counting Cogs ** P |
| 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  
NRICH: Division Rules * P I | Use their knowledge of the order of operations to carry out calculations involving the four operations | Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000  
NRICH: Multiply Multiples 1 * P  
NRICH: Multiply Multiples 2 * P  
NRICH: Multiply Multiples 3 * P |
| Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why | Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)  
NRICH: Up and Down Staircases * P  
NRICH: One Wasn’t Square ** P  
NRICH: Cycling Squares ** P  
NRICH: Picture a Pyramid … ** P | Solve problems involving addition, subtraction, multiplication and division |
<table>
<thead>
<tr>
<th>Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</th>
<th>Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRICH: Curious Number *** P</td>
<td>NRICH: Four Go * G</td>
</tr>
<tr>
<td>NRICH: Division Rules * P</td>
<td></td>
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<tr>
<td>NRICH: Odd Squares * P</td>
<td></td>
</tr>
<tr>
<td>NRICH: Cubes Within Cubes *** P</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</th>
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<tbody>
<tr>
<td>NRICH: Make 100 ** P</td>
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<tr>
<td>NRICH: Multiply Multiples 1 * I</td>
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<tr>
<td>NRICH: Multiply Multiples 2 * I</td>
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<tr>
<td>NRICH: Multiply Multiples 3 * I</td>
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<tr>
<td>NRICH: Highest and Lowest * P</td>
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<tr>
<td>NRICH: Four Goodness Sake *** P</td>
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</tbody>
</table>

<table>
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<tr>
<th>Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</th>
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</thead>
<tbody>
<tr>
<td>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</td>
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<tr>
<td>Recognise and show, using diagrams, families of common equivalent fractions</td>
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<tr>
<td>NRICH: Fractional Wall * P</td>
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<tr>
<td>NRICH: Fractional Triangles * P</td>
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<tr>
<td>NRICH: Bryony's Triangle * P</td>
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<tr>
<td>Compare and order fractions whose denominators are all multiples of the same number</td>
<td>Use common factors to simplify fractions; use common multiples to express fractions in the same denomination</td>
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<tr>
<td>Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths</td>
<td>Compare and order fractions, including fractions &gt;1</td>
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<tr>
<td>Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators</td>
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<tr>
<td>NRICH: Fraction Match * G</td>
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<tr>
<td>Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten</td>
<td></td>
</tr>
<tr>
<td>Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators</td>
<td>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</td>
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<tr>
<td>Recognise and show, using diagrams, equivalent fractions with small denominators</td>
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<tr>
<td>Add and subtract fractions with the same denominator</td>
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<tr>
<td>Add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7]</td>
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<tr>
<td>Recognise and order unit fractions, and fractions with the same denominators</td>
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<tr>
<td>Solve problems that involve all of the above</td>
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<tr>
<td>Round decimals with one decimal place to the nearest whole number</td>
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<tr>
<td>Compare numbers with the same number of decimal places up to two decimal places</td>
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<tr>
<td>Read, write, order and compare numbers with up to three decimal places</td>
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<tr>
<td>Compare numbers with the same number of decimal places up to two decimal places</td>
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<tr>
<td>Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements &gt; 1 as a mixed number (e.g. 2/5 + 4/5 = 6/5 = 1 1/5)</td>
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<tr>
<td>Add and subtract fractions with the same denominator and denominators that are multiples of the same number</td>
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<tr>
<td>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams</td>
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<tr>
<td>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams</td>
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<tr>
<td>Multiply one-digit numbers with up to two decimal places</td>
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<tr>
<td>Use written division methods in cases where the answer has up to two decimal places</td>
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</tbody>
</table>

**Fractions, Decimals, Percentages, Ratio and Proportion**

- NRICH: Andy’s Marbles ** P
- NRICH: Fractions in a Box ** P
- NRICH: Chocolate ** P
- NRICH: Balance of Halves * P
- NRICH: Matching Fractions * G
- NRICH: Round the Dice Decimals 1 * P I
- NRICH: Greater Than or Less Than? * I
- NRICH: Spiralling Decimals *** G

January 2016

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| Solve simple measure and money problems involving fractions and decimals to two decimal places | Solve problems involving number up to three decimal places  
**NRICH:** *Route Product*  
**NRICH:** *Forgot the Numbers* | Solve problems which require answers to be rounded to specified degrees of accuracy  
**NRICH:** *Doughnut Percents* |
|---|---|---|
| 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 | | Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts  
**NRICH:** *Doughnut Percents* |
| Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator a multiple of 10 or 25  
**NRICH:** *Matching Fractions Decimals Percentages* | | Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts  
**NRICH:** *Orange Drink*  
**NRICH:** *Pumpkin Pie Problem*  
**NRICH:** *Jumping*  
**NRICH:** *Rectangle Tangle*  
**NRICH:** *Fraction Fascination* |
| Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison  
**NRICH:** *Would you Rather?* | | Solve problems involving similar shapes where the scale factor is known or can be found |
To solve problems involving unequal sharing and grouping, use knowledge of fractions and multiples.

Use simple formulae and generate linear number sequences.

NRICH: Domino Sets * P I
NRICH: Break it Up! * P I
NRICH: Button-up Some More ** I
NRICH: Holes * P I

Express missing number problems algebraically.

NRICH: Plenty of Pens * P
NRICH: Two and Two *** P I

Find pairs of numbers that satisfy an equation with two unknowns.

Enumerate possibilities of combinations of two variables.

Year 3
- Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
- Use simple formulae

Algebra

Generate and describe linear number sequences

NRICH: Domino Sets * P I
NRICH: Break it Up! * P I
NRICH: Button-up Some More ** I
NRICH: Holes * P I

Express missing number problems algebraically

NRICH: Plenty of Pens * P
NRICH: Two and Two *** P I

Find pairs of numbers that satisfy an equation with two unknowns

Enumerate possibilities of combinations of two variables

Year 4
- Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
- Use simple formulae

Year 5
- Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
- Use simple formulae

Year 6
- Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
- Use simple formulae

Measure, compare, add and subtract:
- lengths (m/cm/mm); mass (kg/g);
- volume/capacity (l/ml)

NRICH: Oh! Harry! ** P
NRICH: Olympic Starters * I
NRICH: Car Journey * I

Convert between different units of measure [for example, kilometre to metre; hour to minute]

Convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]

Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate

Measure the perimeter of simple 2-D shapes

Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres

Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints

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 up to three decimal places

Strand 2 - Measurement

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<tr>
<th>Add and subtract amounts of money to give change, using both £ and p in practical contexts</th>
<th>Find the area of rectilinear shapes by counting squares</th>
<th>Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres</th>
<th>Convert between miles and kilometres</th>
</tr>
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<tr>
<td><strong>NRICH:</strong> How Much Did It Cost? * P</td>
<td><strong>NRICH:</strong> Torn Shapes * P I</td>
<td><strong>NRICH:</strong> Area and Perimeter * I</td>
<td><strong>NRICH:</strong> Through the Window * I</td>
</tr>
<tr>
<td>Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks</td>
<td>Estimate, compare and calculate different measures, including money in pounds and pence</td>
<td>Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes</td>
<td>Recognise that shapes with the same areas can have different perimeters and vice versa</td>
</tr>
<tr>
<td><strong>NRICH:</strong> What is the Time? * P</td>
<td><strong>NRICH:</strong> Discuss and Choose * P</td>
<td><strong>NRICH:</strong> Numerically Equal! ** P</td>
<td><strong>NRICH:</strong> Dicey Perimeter, Dicey Area * G</td>
</tr>
<tr>
<td><strong>NRICH:</strong> Two Clocks ** P</td>
<td><strong>NRICH:</strong> Clocks * P</td>
<td><strong>NRICH:</strong> Shaping It * I</td>
<td><strong>NRICH:</strong> Clocks * P</td>
</tr>
<tr>
<td><strong>NRICH:</strong> The Time Is ... ** P</td>
<td><strong>NRICH:</strong> How Many Times? * I</td>
<td><strong>NRICH:</strong> Cubes * P I</td>
<td><strong>NRICH:</strong> How Many Times? * I</td>
</tr>
<tr>
<td><strong>NRICH:</strong> 5 on the Clock *** I</td>
<td><strong>NRICH:</strong> Fitted *** P</td>
<td><strong>NRICH:</strong> Making Boxes ** I</td>
<td><strong>NRICH:</strong> Fitted *** P</td>
</tr>
<tr>
<td><strong>NRICH:</strong> Wonky Watches ** P</td>
<td><strong>NRICH:</strong> Brush Loads * P I</td>
<td><strong>NRICH:</strong> Ribbon Squares *** P</td>
<td><strong>NRICH:</strong> Brush Loads * P I</td>
</tr>
<tr>
<td><strong>NRICH:</strong> Watch the Clock *** P</td>
<td><strong>NRICH:</strong> How Many Times? * I</td>
<td><strong>NRICH:</strong> Ribbon Squares *** P</td>
<td><strong>NRICH:</strong> Making Boxes ** I</td>
</tr>
<tr>
<td><strong>NRICH:</strong> The Time Is ... ** P</td>
<td><strong>NRICH:</strong> Fitted *** P</td>
<td><strong>NRICH:</strong> Ribbon Squares *** P</td>
<td><strong>NRICH:</strong> Next Size Up ** P</td>
</tr>
<tr>
<td>Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o’clock, a.m./p.m., morning, afternoon, noon and midnight</td>
<td>Read, write and convert time between analogue and digital 12- and 24-hour clocks</td>
<td>Estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water]</td>
<td>Recognise when it is possible to use formulae for area and volume of shapes</td>
</tr>
<tr>
<td><strong>NRICH:</strong> Wonky Watches ** P</td>
<td><strong>NRICH:</strong> Watch the Clock *** P</td>
<td><strong>NRICH:</strong> Numerically Equal! ** P</td>
<td><strong>NRICH:</strong> Next Size Up ** P</td>
</tr>
<tr>
<td><strong>NRICH:</strong> Watch the Clock *** P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Know the number of seconds in a minute and the number of days in each month, year and leap year</td>
<td>Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days</td>
<td>Solve problems involving converting between units of time</td>
<td>Calculate the area of parallelograms and triangles</td>
</tr>
<tr>
<td>Compare durations of events [for example to calculate the time taken by particular events or tasks]</td>
<td>Use all four operations to solve problems involving measure [e.g. length, mass, volume, money] using decimal notation, including scaling</td>
<td>Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]</td>
<td><strong>NRICH:</strong> Next Size Up ** P</td>
</tr>
</tbody>
</table>

January 2016

To make sure this document displays correctly in Word 2000, click on the Table menu, choose Table Properties and then select the option which has no text wrapping
<table>
<thead>
<tr>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strand 3 – Geometry</strong></td>
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</tr>
<tr>
<td>Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them</td>
<td>Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</td>
<td>Identify 3-D shapes, including cubes and other cuboids, from 2-D representations</td>
<td>Draw 2-D shapes using given dimensions and angles</td>
</tr>
<tr>
<td><strong>NRICH:</strong> Building Blocks * P</td>
<td><strong>NRICH:</strong> Nine-pin Triangles *** I</td>
<td><strong>NRICH:</strong> Baravelle * P</td>
<td></td>
</tr>
<tr>
<td><strong>NRICH:</strong> The Third Dimension *** P</td>
<td><strong>NRICH:</strong> Cut It Out *** P</td>
<td><strong>NRICH:</strong> Making Cuboids ** P</td>
<td></td>
</tr>
<tr>
<td><strong>NRICH:</strong> Rolling That Cube * P</td>
<td><strong>NRICH:</strong> Sorting Logic Blocks * G</td>
<td><strong>NRICH:</strong> Making Spirals *** P</td>
<td></td>
</tr>
<tr>
<td><strong>NRICH:</strong> Inkly Cube *** P</td>
<td><strong>NRICH:</strong> What Shape? * G</td>
<td><strong>NRICH:</strong> Shape Draw * P</td>
<td></td>
</tr>
<tr>
<td><strong>NRICH:</strong> Triple Cubes * I</td>
<td><strong>NRICH:</strong> Shapes on the Playground ** P</td>
<td><strong>NRICH:</strong> Baravelle * P</td>
<td></td>
</tr>
<tr>
<td><strong>NRICH:</strong> Sponge Sections ** P</td>
<td><strong>NRICH:</strong> A Puzzling Cube * P</td>
<td><strong>NRICH:</strong> The Third Dimension *** P</td>
<td></td>
</tr>
<tr>
<td><strong>NRICH:</strong> Arranging Cubes * G</td>
<td><strong>NRICH:</strong> Board Block Challenge *** G</td>
<td><strong>NRICH:</strong> Rolling That Cube * P</td>
<td></td>
</tr>
<tr>
<td><strong>NRICH:</strong> National Flags * P</td>
<td><strong>NRICH:</strong> Square Corners ** P</td>
<td><strong>NRICH:</strong> Inky Cube *** P</td>
<td></td>
</tr>
<tr>
<td><strong>NRICH:</strong> Stick Images * G</td>
<td><strong>NRICH:</strong> Overlapping Again ** P</td>
<td><strong>NRICH:</strong> Triple Cubes * I</td>
<td></td>
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<td><strong>NRICH:</strong> Overlapping Again ** P</td>
<td><strong>NRICH:</strong> What Shape? **</td>
<td><strong>NRICH:</strong> Sponge Sections **</td>
<td></td>
</tr>
</tbody>
</table>

**Properties of Shapes**

- Recognise angles as a property of shape or a description of a turn
- Identify acute and obtuse angles and compare and order angles up to two right angles by size
- Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles
- Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
- Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius

- Identify horizontal and vertical lines and pairs of perpendicular and parallel lines
- Complete a simple symmetric figure with respect to a specific line of symmetry
- Identify:
  - angles at a point and one whole turn (total 360°)
  - angles at a point on a straight line and ½ a turn (total 180°)
  - other multiples of 90°
<table>
<thead>
<tr>
<th>Use the properties of rectangles to deduce related facts and find missing lengths and angles</th>
<th>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles</td>
<td>NRICH: <strong>Egyptian Rope</strong></td>
</tr>
<tr>
<td>NRICH: <em>Bracelets</em></td>
<td></td>
</tr>
</tbody>
</table>
| **NRICH:** Egyptian Rope ** P I**  
**NRICH:** Bracelets * I | |
| Describe positions on a 2-D grid as coordinates in the first quadrant | 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 |
| **NRICH:** Coordinate Challenge * P  
**NRICH:** Eight Hidden Squares ** P | **NRICH:** Transformations on a Pegboard * P  
**NRICH:** More Transformations on a Pegboard ** P I |
| **Describe positions on the full coordinate grid (all four quadrants)** | **Describe positions on the full coordinate grid (all four quadrants)**  
**NRICH:** Cops and Robbers * G  
**NRICH:** Coordinate Tan ** P  
**NRICH:** Ten Hidden Squares *** P | | |
| Position and Direction | |
| Describe movements between positions as translations of a given unit to the left/right and up/down | Draw and translate simple shapes on the coordinate plane, and reflect them in the axes |
| **Plot specified points and draw sides to complete a given polygon.**  
**NRICH:** A Cartesian Puzzle * P | |
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</tr>
<tr>
<td>Interpret and present data using bar charts, pictograms and tables</td>
<td>Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs</td>
<td>Solve comparison, sum and difference problems using information presented in a line graph</td>
<td>Interpret and construct pie charts and line graphs and use these to solve problems</td>
</tr>
<tr>
<td><strong>NRICH:</strong> How Big Are Classes 5, 6 and 7? * P</td>
<td><strong>NRICH:</strong> Class 5's Names * P</td>
<td><strong>NRICH:</strong> Real Statistics *** P</td>
<td><strong>NRICH:</strong> Match the Matches ** P</td>
</tr>
<tr>
<td><strong>NRICH:</strong> Our Sports * I</td>
<td><strong>NRICH:</strong> Going for Gold * I</td>
<td><strong>NRICH:</strong> Now and Then ** P</td>
<td><strong>NRICH:</strong> Birds are Vignettes</td>
</tr>
<tr>
<td><strong>NRICH:</strong> The Domesday Project * I</td>
<td><strong>NRICH:</strong> The Domesday Project * I</td>
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</tr>
<tr>
<td><strong>NRICH:</strong> If the World Were a Village * P</td>
<td><strong>NRICH:</strong> Now and Then ** P</td>
<td><strong>NRICH:</strong> More Carroll Diagrams * P</td>
<td><strong>NRICH:</strong> More Carroll Diagrams * P</td>
</tr>
<tr>
<td><strong>NRICH:</strong> It's a Tie ** I</td>
<td><strong>NRICH:</strong> If the World Were a Village * P</td>
<td><strong>NRICH:</strong> Plants ** I</td>
<td><strong>NRICH:</strong> Plants ** I</td>
</tr>
<tr>
<td>Solve one-step and two-step questions [for example, ‘How many more?’ and ‘How many fewer?’] using information presented in scaled bar charts and pictograms and tables</td>
<td>Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs</td>
<td>Complete, read and interpret information in tables, including timetables</td>
<td>Calculate and interpret the mean as an average</td>
</tr>
<tr>
<td><strong>NRICH:</strong> The Olympic Flame: Are You in the 95%? * P</td>
<td><strong>NRICH:</strong> Venn Diagrams * P</td>
<td><strong>NRICH:</strong> Birdwatch * I</td>
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