

## Year 5 Topics : 2014 - 15

Mental practice is done consistently throughout the year.

Frequent reinforcement of tables and mental methods e.g.  $\times 20$  ,  $\times 30$  , etc.

Problem solving and investigations form an important part of the curriculum.

### Autumn Term

#### Place Value

- Read and write numbers up to at least 1 000 000 and determine the value of each digit.
- Order and compare numbers to at least 1 000 000.
- Read Roman Numerals to 1 000 and recognise years in Roman numerals.

#### Rounding numbers

- Rounding numbers up to 1 000 000 to the nearest whole number, 10, 100, 1 000, 10 000 and 100 000.

#### Addition and Subtraction

- Add and subtract numbers mentally with increasingly large numbers.
- Add and subtract whole numbers with more than 4 digits, using the column method with carrying and borrowing.
- Use estimation / rounding to check answers and determine levels of accuracy.

#### Lines and angles

- Parallel, perpendicular and diagonal lines.
- Draw accurate lines to nearest millimetre.
- Acute, obtuse and reflex angles.
- Angles on a straight line and around a point.
- Draw and measure angles using a protractor.

#### Multiples and Factors

- Identify multiples and factors including all factor pairs of a number.
- Common factors and common multiples of two or more numbers.

#### Multiplication and Division

- Multiply and divide numbers mentally drawing upon known facts including doubling and halving.
- Multiply and divide whole numbers and those involving decimals by 10, 100, 1 000 (move the number, never move the decimal. Do not say 'add a 0').
- Practise and extend use of formal written column method of short multiplication up to 4 numbers by one digit e.g.  $2345 \times 7$ .
- Use estimation to check accuracy of answers.
- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division e.g.  $4635 \div 5$ .
- Remainders : round up or down ; as decimals ; as fractions.

### Money

- Convert pence to pounds and visa versa
- Add different amounts of money in columns e.g. £3 + 38p + £2.18

### Properties of Shapes

- Identify 3D shapes from 2D representation.
- Properties and names of quadrilaterals.
- Properties and names of triangles.
- Find missing angles.
- Regular and irregular polygons.

### Tests of divisibility

Tests of divisibility: 2, 3, 4, 5, 9, 10.

### Prime Numbers

- Prime numbers up to 100.
- Prime factors and composite numbers.

### Reflective symmetry

- Identify line symmetry in 2D shapes.
- Reflect shapes across vertical and horizontal lines.

### Fractions

- Find a simple fraction of a quantity e.g. half, quarter, sixth.
- Compare and order fractions whose denominators are all multiples of the same number.
- Equivalent Fractions.
- Simplifying to lowest terms.

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## Spring Term (Year 5)

### Time

- Revise 12 and 24 hour clock.
- Find time differences e.g. from 13:30 to 17:10

### Fractions

- Interchange of improper fractions and mixed numbers.
- Add and subtract fraction with same denominator and multiples of the same denominator.

### Long Multiplication

e.g.  $34 \times 27$ . Use formal written column method.

### Timetables

Complete, read and interpret information in tables, including timetables, Carroll diagrams and Venn diagrams.

### Decimals

- Read and write decimal numbers as fractions.
- Read, write, order and compare numbers with up to three decimals.
- Add and subtract decimals.

### Metric and Imperial Units

- Convert between different units of metric measure used for length, capacity and mass.
- Understand and use equivalences between metric units and common imperial units such as inches, pounds and pints.

### Co-ordinates

Draw and label axes and plot co-ordinates in the 1<sup>st</sup> quadrant only.

### Percentages

Write percentages a fraction with denominator one hundred, and as a decimal fraction.

### Percentage, decimal and fraction interchange

Make connections between percentages, fractions and decimals and convert percentages to decimals and fractions.

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## Summer Term (Year 5)

### Decimals

Multiply and divide decimals by whole numbers less than 10.

### Position and Direction

Use reflection and translation in diagrams and on co-ordinate grids.

### Statistics

- Revise tally charts, frequency tables and bar graphs.
- Interpret line graphs.

### Area and Perimeter

- Area and perimeter of squares and rectangles.
- Composite rectilinear shapes by splitting into rectangles.

### Volume

Calculate volume of cubes and cuboids.

### Construction

Construct triangles using a protractor and pair of compasses.

### Nets

- Nets of cubes, cuboids, triangular prisms and tetrahedrons.
- Construct and make nets.
- Investigate vertices, faces, edges.

# Year 6 Topics : 2014-15

## Autumn Term

### Place Value

- Read, write, order and compare numbers up to 10 000 000.
- Round any whole number up to the required degree of accuracy.
- Use negative numbers in context, and calculate intervals across zero.
- Order and approximate decimals to a given decimal point.

### Four Operations

- Revise methods for addition, subtraction, multiplication and division.
- Use estimation to check answers.

### Division by factors

- Divide numbers using factors e.g.  $1512 \div 42 = 36$

### Pie Charts

- Interpret and construct pie charts.

### Factors, Multiples, Primes

- Revise and identify common factors, primes and multiples.
- Include Highest Common Factor and Lowest Common Multiple.

### Number patterns

- Recognise number patterns and their relationship. Find next 2 numbers in a sequence.

### BIDMAS

- Use Order of Operations to carry out calculations involving the 4 operations.

### Angles

- Revise angles at a point ; on a straight line ; vertically opposite ; in triangles ; in quadrilaterals.
- Find missing angles.

### Properties of Shapes

- Identify and know names and properties of different triangles, quadrilaterals and regular polygons.
- Recognise regular and irregular shapes.

### Converting measures (revision)

- Convert measurements of length, mass, volume, capacity.
- Convert between miles and kilometres and other common imperial and metric units.

### Fractions, Decimals, Percentages

- Compare and order fractions, including fractions greater than 1.
- Add and subtract fractions with different denominators and mixed numbers.

- Multiply simple pairs of proper fractions.
- Divide proper fractions by whole numbers.
- Compare and order decimal numbers up to three decimal places.
- Multiply decimals by whole numbers.
- Divide decimals by whole numbers.
- Convert common fractions, decimals and percentages.
- Find simple percentages of quantities e.g. 30% of £40.

#### Area and Perimeter

- Investigate shapes with same areas but different perimeters.
- Area of triangles.
- Area of composite shapes that can be split into rectangles.

#### Conversion (line) graphs

- Interpret and construct line graphs and use these to solve problems.

#### Construction of triangles

- Revise constructing triangles using a protractor and pair of compasses.

### Spring Term (Year 6)

#### Directed Numbers

- Addition and subtraction e.g.  $2 - (-3)$
- Multiplication and division e.g.  $3 \times -4$

#### Algebra

- Use symbols and letters to represent variables and unknowns e.g. missing numbers, lengths.
- Express missing number problems algebraically.
- Use simple formulae and number sentences e.g. to find the perimeter of a rectangle.
- Arithmetical rules (transfer to algebra):  $a + b = b + a$  ;  $ab = ba$ , etc.

#### Mean

- Calculate the mean as an average.

#### Ordering fractions

- Position fractions and decimals on a number line.
- Compare and order fractions.
- Order a mixed set of fractions, decimals and percentages.

#### Position and Direction

- Plot and describe co-ordinates in all 4 quadrants.
- Draw and translate simple shapes on a co-ordinate grid and reflect them in the axes.
- Draw and label rectangles, parallelograms and rhombi specified by co-ordinates, predicting missing co-ordinates.

### Ratio and Proportion

- Calculate proportion in contexts when the relations between the quantities are in the same ratio e.g. similar shapes, recipes.
- Solve ratio problems involving the relative sizes of two quantities where missing values can be found by using multiplication and division.
- Solve problems involving unequal quantities e.g. 'for every egg you need three spoonfuls of flour', etc.

### Area of triangles, parallelograms, rhombi

- Investigate the areas of these shapes and deduce formulae.
- Learn the formulae and calculate areas.

### Construction

- Construct parallelograms and rhombi.

### Rotations

- Rotations about a point outside or inside the shape, a vertex of a shape, the origin.
- Find the centre of rotation.

### Rotational symmetry

- Find the order of rotational symmetry of shapes.
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## Summer Term (Year 6)

### Multiply and Divide fractions

- Multiply and Divide a fraction by another fraction.

### Percentages

- Change an amount to a percentage e.g. 14 out of 25 = 16%
- Find a percentage of a quantity without using a calculator e.g. 16% of £15.

### Equation of a line / straight line graphs

- Discover, by plotting x and y co-ordinates, simple straight line graphs such as  $x = y$  ;  $x = -y$  ;  $x = 1$  ;  $y = -3$ .

### Line Symmetry

- Reflect shapes across horizontal and vertical lines (x and y axes) and other mirror lines parallel to x and y axes.
- Reflect across diagonal lines at  $45^\circ$  ( $x = y$  and  $x = -y$ ).
- Describe reflections, giving the equation of the line e.g.  $y = 3$  ;  $x = y$ , etc.

### Volume

- Calculate volume of cubes and cuboids extending to units such as  $\text{mm}^3$  and  $\text{km}^3$
- Convert cubic measurement e.g.  $1\text{m}^3 = 1\,000\,000\text{cm}^3$ ;  $1\text{cm}^3 = 1\,000\text{mm}^3$ .

### Units for speed

- Introduce compound units for speed such as miles per hour and km per hour.

- Solve simple speed problems.

### Circles

- Illustrate and name parts of circles including radius, diameter and circumference.

### Long Division

- Divide numbers up to 4 digits by two-digit whole numbers using the formal long division method e.g.  $2346 \div 27$
- Interpret remainders as whole numbers, fractions, decimals or by rounding, as appropriate for the context.

### Parallel lines

- Draw sets of parallel and intersecting lines, measuring angles and investigating connections.
- Investigate : Alternate (Z) angles ; Corresponding (F) angles ; Interior / supplementary (C) angles ; opposite (X) angles.

### Like Terms / simplifying

- Understand *like* and *unlike* terms.
- Simplify algebraic expressions.

### Simple substitution

- Starting with a single variable and moving to multiple variables.

### Equations

- One-step equations e.g.  $y + 3 = 7$  ;  $12 - m = 4$ .  
Linear, with whole number coefficients.
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# Year 7 Topics : 2014 - 15

## Autumn Term

Long Division : Review.

### Fractions

- Review addition, subtraction and multiplication.
- Division and multiplication of fractions including easy mixed numbers.

### Angles

- Review angle properties of intersecting and parallel lines.
- Mixed problems including triangles, quadrilaterals & parallel lines.

### Quadrilaterals

- Review properties of quadrilaterals & use of symbols for labelling.

### Decimals

- Review addition, subtraction and multiplication.
- Review  $\div$  and  $\times$  by 10, 100, 1000.
- Mixed questions.

### Rounding to decimal places

- Correct to a given number of decimal places, especially when using a calculator.

### Enlargement

- Enlarge a shape by a positive whole number scale factor from a point on the perimeter of the shape and from a point on the outside or inside the shape.
- Scale factors for areas.

### Index Notation

- Simplify algebraic terms e.g.  $a \times a \times a = a^3$ ,  $a + a + a = 3a$ ,  $4d^2 \times 2d^3 = 8d^5$
- Simplify algebraic terms when dividing.
- Expand with brackets e.g.  $(3cd^2)^3 = 27c^3d^6$ .

### Proportion

- Calculate relative values by finding the value of one of the item.
- Calculate the result of any proportional change using only multiplicative methods.

### Expressions

- Write algebraic expressions from data.
- Extend to making equations and solving them.
- Include areas & perimeters of rectangles.

### Volume

- Review properties of cubes, cuboids & prisms.
- Review volumes of cubes & cuboids using the formula.

### Directed Numbers

- Review including simplification of algebraic expressions & substitution.
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### Brackets

- Multiply out brackets with a number in front, with a letter or letters in front, with letters & numbers in front.

### Calculator skills

- Use of scientific calculator.
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## Spring Term (Year 7)

### Factorisation

- Look for common factors in the numbers.
- Look for common letters, including powers.

### Significant figures

- Correct to a given number of significant figures.

### Angles in Polygons

- Review properties and terminology (names & properties of polygons & quadrilaterals).
- Review the difference between regular and irregular.
- Find the exterior & interior angles of regular polygons.
- Calculate the interior angle sum from the interior angle.
- Calculate the interior angle sum by drawing diagonals from one vertex and counting the triangles.

### Equations

- Review and numbers on one side, unknowns on both.
- Unknowns and numbers on both sides.

### Transformations

- Combine translations, reflections, rotations, enlargements.

### Surface Area

- Surface area of cuboids.

### Area

- Trapezia : either by learning formula or by splitting into a rectangle & triangle.
- Area of rhombus, parallelogram & kite.

### Percentages

- Review finding % of a number with & without calculator.
- Problems on % loss, discount, interest.
- Problems on % change.

### Product of Primes

- Write numbers as a product of primes using index form.
- Find HCF, LCM, square roots and square numbers using products of primes.

### Inequalities

- Solve inequalities including representing the number on a number line.

## Algebraic Fractions :

- Simplify algebraic fractions / equations.
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## Summer Term (Year 7)

### Number patterns

- Given a rule e.g.  $T_n = 3n + 1$  find the values in the sequence.
- Find the rule & express it in words & *algebraic terms*.

### Bearings

- Read and measure bearings and write them as 3-figure numbers.
- Make scale drawings from given information.
- Interpret different scales e.g. 1 : 1000

### Substitution

- Review of substitution using negative numbers and fractions.

### Ratio

- Write in simplest form.
- Find the parts or whole given one part.

### Problems in measurement

- Problem solving involving metric units.

### Speed, Time, Distance

- Find distance, speed and time in simple problems.
- Emphasis on understanding that 30kmph means 30km are travelled in 1 hour.

Simple travel graphs.

*Extension.....*

*Calculating average speed for multistage journeys.*

*Simple travel graphs and using the graph to find speed.*

*Relative speed (scholarship).*

### Simplification

- Review of all simplification, in particular multiplication, division and using brackets.

### Isometric drawing of 3D shapes

- Make models from multi-link cubes & sketch. Build models from sketches.

### Averages

- Mean, median, range.

*Extension.....*

*More difficult problems including finding the new mean when one item is taken away.*

### Pythagoras Theorem (extension)

- *Formula by investigation.*
- *Finding any side.*
- *Problems.*

## Year 8 Topics: 2014 - 15

*Much of the time in Year 8 will be spent on revising and extending topics already learnt.*

*The syllabus will be completed in the Autumn term in order to give sufficient time for revision and practice.*

*Two mock exams will be written. One at the end of the Autumn Term and one towards the end of the Spring Term.*

*The Common Entrance exam has 3 levels with level 3 being the most challenging.*

Some of the topics to be covered in the Autumn term are as follows:

### Circles

Find the area and circumference of circles using the formula.  
Find the volume of a cylinder (L2 + 3)

### Line graphs

Draw straight line graphs with equations such as  $y = x$ ;  $x = 2$ , etc.  
Find parallel lines to such graphs.  
Draw straight line graphs such as  $y = 3x + 2$  using a table of values.  
Find points of intersection.  
Find areas of coordinates between lines drawn on a graph.  
Draw quadratics using a table (L3 only).

### Indices (revision)

Rules for indices.

### Trial and improvement

Solving polynomial equations and formulating the equations (L2 +3).

### Simultaneous equations ( L3)

Straight forward equations e.g.  $3x + y = 13$  ;  $4x - y = 9$  .  
Formulating equations in problems.

### Scatter graphs

Draw scatter graphs.  
Interpret scatter graphs and look for a correlation.  
Draw a line of best fit.

### Information Tables

Interpretation of information tables such as Carroll diagrams,  
mileage charts, probabilities.

### Construction

Revise construction of polygons, in particular rhombi and parallelograms.

## Fractional equations

Solve simple equations such as  $\frac{c}{2} = 6$  ;  $\frac{3t}{5} = 9$ .

More complicated equations (L2 + 3) e.g.  $\frac{t}{3} - 1 = 5$ .

## BIDMAS and calculator skills (revision)

Revision of BIDMAS using a calculator.

Solve problems and give to a correct number of significant figures or decimal places.

## Changing the subject of the formula (L 2 + 3)

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## Some topics for revision in the Spring and Summer Terms.....

- 4 rules (+ - x ÷)
- Square numbers
- Prime numbers
- Drawing nets e.g. cubes and cuboids
- Area (including surface area e.g of cuboid)
- Perimeter
- BIDMAS
- Algebra substitution
- Solving equations e.g.  $6a - 5 = 2a + 5$
- Factorising e.g  $8x + 24$
- Transformations : reflection, rotation, translation, enlargement.
- Probability
- Angles : triangles, straight lines, parallel lines
- Properties of quadrilaterals and triangles
- Time : adding and subtracting e.g.  $3\text{min } 59\text{sec} + 4\text{min } 49\text{sec}$
- Interpreting tables and graphs e.g. venn and carroll diagrams

- Conversion graphs
  - Express a number as the product of its prime factors.
  - Decimal places and significant figures (rounding)
  - Ordering fractions and decimals on a number line
  - Measurement e.g. converting metres to kms, etc
  - Compass direction
  - Co-ordinates on  $x, y$  axes
  - Equations of a line e.g.  $y = 4$
  - Multiples and factors
  - Product of numbers
  - Averages : mean, median, mode, range
  - Finding the % of a number e.g. 15%, 20%
  - Money : adding, subtracting, multiplying (e.g.  $\pounds 1.97 \times 3$ )
  - Fractions
    - of amounts e.g. 60p of  $\pounds 2$  and  $\frac{3}{4}$  of 36
    - simplifying fractions
    - dividing e.g.  $4 \div \frac{2}{3}$
    - adding and subtracting e.g.  $\frac{1}{3} + \frac{1}{4}$
    - converting to decimals
-