The John Lyon School

Mathematics 13+ Syllabus

Candidates will be tested on the National Curriculum at Level 6, plus a few topics at Level 7.

Topics headings are listed below:

- Level 6 topics which are not to be examined are shown, but 'ruled out'.

- Level 7 topics are given in italics.

Attainment Target 1: Using and Applying Mathematics

- Pupils carry through substantial tasks and solve quite complex problems by breaking them down into smaller, more manageable tasks.

- *Improvements they have made. Pupils justify their generalisations or solutions, showing some insight into the mathematical structure of the situation being investigated.*

- They interpret, discuss and synthesise information presented in a variety of mathematical forms.

- Pupils' writing explains and informs their use of diagrams.

- Pupils are beginning to give a mathematical justification for their generalisations; they test them by checking particular cases.

Attainment Target 2: Number and Algebra

- Pupils order and approximate decimals when solving numerical problems and equations such as $x^2 = 20$, using trial-and-improvement methods.

- *They understand the effects of multiplying and dividing by numbers between 0 and 1.*

- *They understand and use proportional changes.*

- Pupils are aware of which number to consider as 100 per cent, or a whole, in problems involving comparisons, and use this to evaluate one number as a fraction or percentage of another.

- They understand and use the equivalences between fractions, decimals and percentages, and calculate using ratios in appropriate situations.

- When exploring number patterns, pupils find and describe in words the rule for the next term or nth term of a sequence where the rule is linear.

- They formulate and solve linear equations with whole number coefficients.

- They represent mappings expressed algebraically, interpreting general features and using graphical representation in four quadrants where appropriate.

Attainment Target 3: Shape, Space and Measures

- Pupils recognise and use common 2-D representations of 3-D objects.

- They know and use the properties of quadrilaterals in classifying different types of quadrilateral.

- They solve problems using angle and symmetry properties of polygons and properties of intersecting and parallel lines, and explain these properties.

- They understand and use appropriate formulae for finding circumferences and areas of circles, areas of plane rectilinear figures and volumes of cuboids when solving problems.

- They enlarge shapes by a positive whole-number scale factor.

- *Pupils appreciate the continuous nature of measurement and recognise that a measurement given to the nearest whole number may be inaccurate by up to one half in either direction.*

Attainment Target 4: Handling Data

- They construct and interpret frequency diagrams.

- They construct pie charts.

- Pupils draw conclusions from scatter diagrams, and have a basic understanding of correlation.

- When dealing with a combination of two experiments, pupils identify all the outcomes, using diagrammatic, tabular or other forms of communication.

- In solving problems, they use their knowledge that the total probability of all the mutually exclusive outcomes of an experiment is 1.