

## Class Eight | Learning Journey & Curriculum Map

### Class Eight | Child Development

Class 8 is the culmination of the 'Class Teacher years' and in the subjects and topics that are taught, there is a kind of completion, on one level, of a survey of the world that began in Class 1. In their fourteenth year, the children/students have learned enough about the world to be able to orientate themselves in it - to begin to think about their place in it - even to live independently, if necessary. They understand, at a basic level, how things work; they are thinking about the future.

### Class Eight | Numeracy | Number

Active Learning   Intention	Active Teaching   Implementation	Active Environments   Impact
<ul style="list-style-type: none"> <li>● Calculate compound interest, mortgage rates, income tax</li> <li>● Use percentage calculations for interest, growth and decay, and compound calculations</li> <li>● Draw and interpret time graphs</li> <li>● Add, subtract, divide and multiply fractions including mixed numbers</li> <li>● Calculate powers of 10</li> <li>● Use standard form in calculations</li> <li>● Expand and factorise algebraic expressions using single brackets</li> </ul>	<ul style="list-style-type: none"> <li>● Revise fractions, squares and roots, equations, practical problems</li> <li>● Demonstrate a range of methods for problem-solving</li> <li>● Encourage pupils to demonstrate solution of problems to class</li> <li>● Give volunteer pupils responsibility of explaining processes to their peers from front of class</li> <li>●</li> </ul>	<ul style="list-style-type: none"> <li>● Work with graded textbooks and worksheets in practice lessons</li> <li>●</li> </ul>

<ul style="list-style-type: none"><li>● Expand and factorise expressions with 2 or more brackets</li><li>● Factorise quadratic expressions</li><li>● Collect data and draw scatter graphs</li><li>● Use frequency and grouped frequency tables to calculate averages</li><li>● Draw cumulative frequency diagram</li><li>● Use tree diagrams to calculate probability</li><li>● Multiply and divide decimals</li><li>● Round to decimal places and significant figures</li><li>● Identify prime numbers</li><li>● Determine HCF and LCM</li><li>● Calculate using negative numbers</li><li>● Calculate fractions and percentages of a quantity</li><li>● Simplify ratios, express ratios as a fraction</li><li>● Solves best buy problems</li><li>● Reverse percentage</li><li>● Use the rules for multiplying and dividing indices</li><li>● Use negative and fractional powers</li></ul>		
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**Class Eight | Numeracy | Space & Measure**

Active Learning   Intention	Active Teaching   Implementation	Active Environments   Impact
<ul style="list-style-type: none"> <li>● Calculates areas of irregular forms</li> <li>● Draw translations, reflections and rotations</li> <li>● Draw linear graphs from equations</li> <li>● Solve simultaneous equations graphically</li> <li>● Generate linear sequences</li> <li>● Generate non-linear sequences</li> <li>● Calculate interior and exterior angles of polygons</li> <li>● Use geometric reasoning to solve spatial puzzles</li> <li>● Use Pythagoras' Theorem to solve problems in right angle triangles</li> <li>● Calculates surface area and volume of simple 3D shapes</li> <li>● Understand properties of and can construct 5 Platonic solids</li> <li>● Use trigonometric ratios with right angle</li> </ul>	<ul style="list-style-type: none"> <li>● Expect careful and precise use of compasses, ruler, set squares</li> <li>● Ensure best use of good quality materials: sharpened lead pencils, cartridge paper, use of shading to denote angles and perspective</li> <li>● Encourage experimentation with 3D drawing and complex line form drawing</li> </ul>	<ul style="list-style-type: none"> <li>● Extend 3D and spatial awareness, collaboration, creativity and imagination by construction challenges using newspaper, card or other materials, working in groups</li> <li>● Organise groups to design, plan and draw shelters and buildings for specific purposes</li> <li>● Show and display artists' experimentations with perspective e.g. M.C.Escher</li> </ul>

## Class Eight | Numeracy | Curriculum Narrative

We take the experiential approach with the geometry of regular solids, making the forms in card - constructing perfect figures using compasses and then working out (imagining) in two dimensions, the map of the three-dimensional figure before cutting it out (accurately!) and gluing it together, is one way of exercising the thinking. A second approach is to cut a certain number of bamboo sticks to the same length, fit them all together and see what the result is. This is much harder at first, but enables the students to understand the inevitability of these figures - that they are not 'made up' or arbitrary, but are the certain and only possible result of a combination of numbers and rules, and that we can work out mathematically that there cannot be more than five of these regular solids - that the Greeks found that out and we can be certain no-one will ever discover another one. By finding the centre of each face of each figure and connecting these, new regular solids arise, and the relationships between the forms and the numbers involved is self-evident. A biography of the Medieval Arab Mathematician, Abu Ja'far Muhammad ibn Musa al-Khwarizmi leads into his life and work in more detail before progressing with some of the mathematical discoveries and processes that derive from his work: Identity – the Idea of 'Sameness'; laws of addition and multiplication: associative law and commutative law; the laws of indices; integers (positive and negative numbers): the grammar' of the + and – signs, rules for addition and rules for multiplication and division; mathematical sentences: terms, forming expressions and forming equations; solving simple linear equations (using al-Khwarizmi's principles of opposition and reunion); collecting 'like terms'; the distributive law of multiplication over addition, leading to expanding brackets; graphs of linear equations: plotting points, the idea of gradient, the intercept on the y-axis, equations of graphs from the y-intercept and gradient, and graphs of equations using the y-intercept and gradient.