



Wykham Park Academy & Futures Institute Banbury

<p>OUR 16 <b>BIG</b> IDEAS of MATHS </p>	
<p><b>1) THE NATURE OF NUMBERS</b> The set of real numbers is <i>infinite</i>, and each real number has a <i>specific</i> position on a number line. We work with numbers using the <i>base-10 system</i> viz. digits 0-9, groups of ten, and place value.</p>	<p>N</p>
<p><b>2) OPERATION MEANINGS (SIGNIFICANCE)</b> The same number sentence (e.g. <math>12-4 = 8</math>) can be <i>associated with different concrete or real-world situations</i>, AND different number sentences can be associated with the same concrete or real-world situation.</p>	<p>N R/P</p>
<p><b>3) EQUIVALENCE &amp; COMPARISON</b> Any number, measure, numerical expression, algebraic expression, or equation can be <i>represented in an infinite number of ways</i> that have the same value and <i>can be compared</i>.</p>	<p>N A R/P</p>
<p><b>4) BASIC FACTS, NUMBER PROPERTIES &amp; ALGORITHMS</b> For a given set of numbers there are relationships that are always true, and these are the <i>rules</i> that govern arithmetic and algebra. Basic facts and algorithms for operations with rational numbers use notions of equivalence to transform calculations into simpler ones.</p>	<p>N A R/P</p>
<p><b>5) ESTIMATION</b> Numerical calculations and measurements can be <i>approximated</i> by replacing numbers with other numbers that are close and easy to compute with mentally.</p>	<p>N G</p>
<p><b>6) MEASUREMENT</b> Some <i>attributes of objects are measurable</i> and can be quantified using <i>unit</i> amounts.</p>	<p>G</p>
<p><b>7) VARIABLES, RELATIONS &amp; FUNCTIONS</b> Mathematical situations and structures can be translated and <i>represented abstractly</i> using variables, expressions, and equations. Mathematical rules (relations) can be used to assign members of one set to members of another set. A special rule (function) assigns each member of one set to a unique member of the other set.</p>	<p>A R/P</p>

<p><b>8) PATTERNS &amp; RELATIONSHIPS</b>  Relationships can be <i>described</i> and <i>generalizations</i> made for mathematical situations that have numbers or objects that repeat in predictable ways.</p>	N A R/P G
<p><b>9) PROPORTIONALITY</b>  If two quantities vary proportionally, that relationship can be represented as a linear (<math>y=kx</math>) or reciprocal function (<math>xy=k</math>)</p>	A R/P
<p><b>10) EQUATIONS &amp; INEQUALITIES CAN BE SOLVED</b>  Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalities so <i>solutions</i> can be found.</p>	N A
<p><b>11) CLASSIFICATION</b>  Abstract and concrete mathematical items can be <i>grouped according to their characteristics</i>.</p>	N A G
<p><b>12) SHAPES and SOLIDS</b>  2D and 3D objects with or without curved surfaces can be <i>described, classified, and analyzed</i> by their <i>attributes</i>.</p>	G
<p><b>13) ORIENTATION, LOCATION &amp; TRANSFORMATIONS</b>  Objects in space can be oriented in an infinite number of ways, and an object's location in space can be described quantitatively. These objects can be transformed, described and analyzed mathematically.</p>	A G
<p><b>14) DATA CAN BE PROCESSED</b>  Some questions can be answered by collecting and analyzing data. Data can be represented visually using tables, charts, and graphs, and the centre and spread of the data sets can be described and analysed using numerical measures.</p>	S/P
<p><b>15) CHANCE</b>  The chance (<i>probability</i>) of an event occurring can be described numerically by a number between 0 and 1 inclusive and used to make <i>predictions</i> about other events.</p>	S/P
<p><b>16) PROOF</b>  Mathematical statements can be proved or disproved using previously established statements, self-evident truths or assumed statements. This may be through the use of physical objects, diagrams, manipulatives, or algebra.</p>	A G

Sources:

- Cambridge Maths: <https://www.cambridgemaths.org/questions/big-ideas/>
- <https://www.yateacademy.co.uk/page/?title=Maths&pid=153>
- [https://www.atm.org.uk/write/MediaUploads/Resources/Big\\_Ideas.pdf](https://www.atm.org.uk/write/MediaUploads/Resources/Big_Ideas.pdf)