**Threshold Concepts in mathematics – Year 8**

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| **Threshold concepts** |  |
| **Key concepts ideally learned before Year 8** | **Date** |
| Know times table facts and related division facts to automaticity |  |  |  |
| Add and subtract one-digit numbers to automaticity |  |  |  |
| Double and halve all number accurately, including decimal numbers |  |  |  |
| **Algebra** | **Date** |
| Simplify and manipulate algebraic expressions to maintain equivalence by: • multiplying a single term over a bracket • taking out common factors • expanding products of two or more binomials • simplifying expressions involving sums, products and powers, including the laws of indices |  |  |  |
| Rearrange formulae to change the subject, where the subject appears once |  |  |  |
| **Circles and Area** | **Date** |
| Use the formula to find the area of a circle (πr²) |  |  |  |
| Use the formula to find the perimeter of a circle (πd) or (2πr) |  |  |  |
| Know and use the vocabulary of circles and area: origin, radius, diameter, circumference, chord, segment, sector, tangent, area, perimeter, formula |  |  |  |
| **Fractions** | **Date** |
| Integer divided by fraction |  |  |  |
| Fraction divided by fraction |  |  |  |
| Find the whole amount given a fraction of the amount |  |  |  |
| Find a fractional increase or decrease |  |  |  |
| **Geometry** | **Date** |
| Convert between cm² and m²  |  |  |  |
| Convert between cm³ and m³  |  |  |  |
| Derive and apply formulae to calculate and solve problems involving area of shapes |  |  |  |
| Derive and apply formulae to calculate and solve problems involving volume and surface area of other prisms (including cylinders)  |  |  |  |
| **Percentages** | **Date** |
| Interpret percentages as operators, with and without a calculator |  |  |  |
| Solve problems involving percentage change, including Percentage increase, decrease and original value problems |  |  |  |
| **Ratio, Proportion and Rates of Change** | **Date** |
| Use ratio notation, including reduction to simplest form |  |  |  |
| Use compound units such as speed, unit pricing and density to solve problems |  |  |  |
| **Averages** | **Date** |
| For non-grouped data given in the form of a table, find the mean, median, mode and range |  |  |  |