Securing Level 5

For children to attain a secure level 5, they need to:

Securing Mental and Written Methods of Calculation

- understand decimal numbers and the effect of multiplying and dividing these by powers of ten
- use known facts to derive related facts, for example, use 8×7 to give the answer to 0.08×7 or 80×70
- add and subtract numbers with a different number of decimal places, for example, $19.1 - 13.42$
- have efficient written methods for all four operations, where they understand each step, and use approximation to check that the answer to a written method is about the right size
- add and subtract negative numbers in contexts such as height above sea level
- appreciate that, in an equation, a calculation inside brackets must be worked out first
- find the appropriate unit fraction of a quantity, using division, then multiply their answer to find a non-unit fraction, such as 53
- understand how to use key percentages, such as 10%, of a quantity to find other percentages

Explaining Patterns and Reasoning

- describe a situation or problem in their own words before using a diagram to represent it, or translating it into calculations or equations to be solved
- use accurate and precise mathematical language, including that associated with reasoning, for example, predict, hypothesis, test, sometimes true, always true, demonstrate and prove
- describe patterns in number sequences and predict numbers that will or will not fall within the sequence, for example, those in the third column of a number grid with eight columns
- use patterns in simple number sequences to predict, for example, the tenth term without needing to list all of the previous terms
- test general statements, using different examples, but appreciate that finding lots of examples for which a statement holds true is not enough to prove that it is true for all cases
- identify shared features of examples that satisfy a general statement, to begin to explain why it will always be true
- construct and use simple formulae involving one or two operations, for example, the cost of **s** ice creams at **75** pence each is **75s** pence

Working with Fractions, Ratio and Proportion

- interpret and describe ratio, using vocabulary such as *to every, for every*, scale and understand the use of the colon in ratio notation such as *1 : 5*
- interpret and describe proportion, using vocabulary such as *in every, parts of the whole,* including the language of fractions and percentages such as *two-fifths of*, *40 per cent of*
- use understanding of scaling up or down to solve problems involving ratio and proportions, for example, if 100g of rabbit food costs 70p then 200g would cost £1.40, and 50g would cost £0.35;if a 10-metre length of pipe holds 240cl of water a 3-metre length of the same pipe holds 72cl
- be able to describe one amount as a fraction or percentage of another, for example, recognising that 20p is $\frac{20}{200}$ or $\frac{1}{10}$ or 10% of £2

- understand equivalence and convert between fractions, decimals and percentages; use a calculator to find the decimal equivalent of a fraction , for example, find $\frac{3}{20}$ = 0.15 by working out 3 ÷ 20

- compare fractions by converting them into equivalent fractions with the same denominator or into decimals

- understand and interpret mixed numbers, for example, $2\frac{1}{3}$ and improper fractions $\frac{8}{3}$

- express a remainder as a fraction where appropriate 11 ÷ 4 = $2\frac{3}{4}$

Solving Multi-step Problems

- solve multi-step problems in a range of contexts, including money, measures, time, shape and data-handling

- solve problems that involve fractions, decimals, percentages, ratio and proportion

- solve problems that involve the use of inverse operations, such as *I think of a number*... problems

- identify and obtain the necessary information required to solve the problem and determine if there is any important information missing

- carry out calculations accurately using mental, written and calculator methods, choosing those most appropriate to the problem

- communicate clearly, both orally and in writing, using diagrams and symbols where appropriate and explaining or recording each step of the problem

Using Properties of Shapes and Angles

- explore the properties of triangles, quadrilaterals and other polygons and use this knowledge to identify similarities and differences between shapes

- recognise parallel and perpendicular edges or faces in 2-D and 3-D shapes

- draw shapes to satisfy criteria, including symmetrical properties, for example, on an isometric grid draw hexagons with three angles of 60°, on a square grid draw a shape with one line of symmetry with given coordinates

- extend their reasoning to test, explore and explain properties of shapes such as why and when the diagonals of quadrilaterals bisect each other

- solve shape problems, for example, find all possible side lengths for an isosceles triangle with a perimeter of 22cm and one side of 8cm

- use knowledge of angle properties to solve problems, for example, to find the internal angle of a regular octagon

Interpreting and Comparing Graphs and Outcomes

- read data accurately from graphs and charts, including making reasoned estimates for data falling between labelled divisions

- understand when and how line graphs show the relationship between two measures and interpret these graphs, for example, those that show how one measure changes over time

- interpret and compare pie charts where it is not necessary to measure angles, for example, comparing two pie charts that represent two different groups

- identify possible outcomes from an experiment, recognising if they are equally likely

- interpret the probability on the 0 to 1 scale and find probabilities where there are equally likely outcomes, for example, getting an even number on a regular hexagonal spinner