‘Working Mathematically’: Upper Key Stage 2 (‘Phase C’)

Application	
Ideas, questions and lines of enquiry	• identifies and obtain necessary information to carry through a task and solve mathematical problems - *recognises when information is or is not crucial to the solving of a problem* - *determines what is missing and develops lines of enquiry* • selects the most appropriate equipment and explains choices • uses their mathematical experiences to explore ideas and raises questions to pursue further lines of enquiry
Represent and communicate	• shows understanding of situations by describing them mathematically using symbols, words and diagrams • decides how best to represent conclusions, using appropriate recording - *begins to understand and use formulae and symbols to represent problems* • organises work from the outset, looks for ways to record systematically and checks results to see if they are reasonable - *checks for and spots errors while working* • constructs complex explanations and reasoned arguments
Plan an approach and implement it	• understands and uses facts and procedures creatively to solve complex or unfamiliar problems • uses appropriate mathematical concepts, processes, skills and tools to solve a problem • interprets the mathematical solution in the context of the problem and makes sense of the solution
Computational complexity (Within the range of number facts known)	• solves problems with a larger number of numeric steps, at least one of which is more complex

Reasoning	
Make connections	• poses own questions and create problems for peers that are similar to ones worked on in class • develops own lines of enquiry
Evaluate	• considers efficiency of methods and adapts work accordingly throughout problem solving activities
Draw conclusions	• conjectures to develop own line of enquiry when testing outcomes • draws own valid conclusions and give an explanation of reasoning (including written explanations)
Generalise	• identifies more complex patterns and begins to express generalisations using symbolic notation
Justify	• justifies methods chosen and why the solution is the best one or not • supports conclusions with examples and counter examples

Problem solving strategies
• organises, deconstructs and prioritises information; uses systematic lists and tables to identify information • uses informed ‘guess, check and improve’ • identifies and uses a pattern • draws a mathematical model to support visualisation of problem • uses and applies negative proof (uses counter argument to prove the rule) • uses a structured approach to tackle the problem (devise a plan) - *e.g. works backwards* • solves a simpler related problem