

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

Application

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| Ideas, questions and lines of enquiry | <ul style="list-style-type: none"> identifies and obtain necessary information to carry through a task and solve mathematical problems <ul style="list-style-type: none"> <i>recognises when information is or is not crucial to the solving of a problem</i> <i>determines what is missing and develops lines of enquiry</i> 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 | <ul style="list-style-type: none"> shows understanding of situations by describing them mathematically using symbols, words and diagrams decides how best to represent conclusions, using appropriate recording <ul style="list-style-type: none"> <i>begins to understand and use formulae and symbols to represent problems</i> organises work from the outset, looks for ways to record systematically and checks results to see if they are reasonable <ul style="list-style-type: none"> <i>checks for and spots errors while working</i> constructs complex explanations and reasoned arguments |
| Plan an approach and implement it | <ul style="list-style-type: none"> 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) | <ul style="list-style-type: none"> solves problems with a larger number of numeric steps, at least one of which is more complex |

Reasoning

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| Make connections | <ul style="list-style-type: none"> poses own questions and create problems for peers that are similar to ones worked on in class develops own lines of enquiry |
| Evaluate | <ul style="list-style-type: none"> considers efficiency of methods and adapts work accordingly throughout problem solving activities |
| Draw conclusions | <ul style="list-style-type: none"> conjectures to develop own line of enquiry when testing outcomes draws own valid conclusions and give an explanation of reasoning (including written explanations) |
| Generalise | <ul style="list-style-type: none"> identifies more complex patterns and begins to express generalisations using symbolic notation |
| Justify | <ul style="list-style-type: none"> 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