



S.T.O.P.S.

SEQUENCED TEACHING OF PROBLEM SOLVING



PROBLEM SOLVING POLICY


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This policy is intended to bring consistency, continuity and progression to ensure that the mathematical strategies taught build upon each other from Reception to Year 6.

This policy gives ideas of how you can use STOPS in your classroom or for assessment purposes but you must remember that STOPS is a teaching resource and can be used in any way to suit the children that you teach in your school.

“Problem Solving” is at the very heart of the maths curriculum and we believe that the skills needed should be taught using the “8 Problem Solving Strategies” (please see below)

Here at STOPS we strongly recommend teaching one lesson per week on Problem Solving Skills. Most of the schools that we work with adopt a 3-1-1 structure for the week’s maths lessons. 3 lessons on number and calculation, 1 lesson on Geometry, measures and statistics and 1 lesson on Problem Solving. And let’s be clear, we do not count solving “word problems” to be “Problem Solving”. Problem Solving is based on skills of logic, reasoning, communication and application to solve a wide range of puzzles and mathematical problems.

Monday	Tuesday	Wednesday	Thursday	Friday
Ma2 Place value Number RUCSAC	Ma2 Calculation Policy / Number RUCSAC	Ma2 Calculation Policy/ Number RUCSAC	 Problem Solving	Geometry Statistics

Before you begin teaching the 8 Problem Solving Strategies, it’s vital to get the right culture in your class. Children are going to be presented with challenging problems and must develop “resilience” (Ofsted word!) and not give up. We suggest setting up a culture in your class where children really like the feeling of being challenged as it means that they will make great progress in that lesson. Give children stickers for being stuck! Celebrate it so that children embrace it.

They also need strategies of what to do if they are stuck. The 8 Problem Solving strategies really come into their own here. Other strategies include: using the Learning Intention, success criteria, using display around the class, teacher’s written feedback, asking friends, asking adults, fetching resources that might help and so on.

Now that you have the culture of loving problem solving, you’re ready to get started. Below is how we would recommend getting started with teaching problem solving skills, but it is only a guide and any teacher should be using the resource how they want to.

1. Choose the problem solving strategy that you are going to teach.
This may come from School Policy, or long-term planning. As children get older, they can be exposed to more strategies in the same lesson and they will be able to discuss how they have used a variety of strategies. This also serves as an assessment.
2. Show the children the problem. Stand back and watch what they do.
It is critical to not intervene, allow the children to be stuck and discuss strategies for at least 5 minutes. If a more-able "Problem Solver" solves it quickly, they will need to be given a harder problem from the same column of STOPS.
3. Choose children to lead the discussion, based on both valid strategies and misconceptions. The children must feel free to make mistakes and know that mistakes have value.
4. From discussion, share the strategy that is being taught in this lesson and model how it could be done.
5. Allow children to return to the problem, or a differentiated version using resources identified by STOPS.
6. Continue independent work, facilitate children's discussions with each other and address the whole class with a mini-plenary as appropriate.
7. Finish the lesson with a sense of achievement and satisfaction.

If you are using the pupil record cards, this is where you could record which children solved the problems.
See "Pupil Record Cards" for more details.

http://www.stopsproblemsolving.co.uk/main_page/Site_2/Downloads_page_pdf_files/Pupil%20records%20PDF.pdf

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Act it Out

Physically acting out the situation presented in a math problem so helps you better-understand the problem.

Trial & Error

Solve a problem by guessing the answer and then checking that the guess fits the conditions of the problem.

Trial by improvement

Solve a problem by removing improbable answers until the correct answer remains.

Make a List/table

Solve a problem by writing the information in a more organised format to discover relationships and patterns among the data.

8 problem solving areas

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Act it Out	Act it Out	Act it Out	Act it Out		
Trial & Error	Trial & Error	Trial & Error	Trial & Error	Trial & Error	
Trial by improvement	Trial by improvement	Trial by improvement	Trial by improvement	Trial by improvement	Trial by improvement
Looking for Patterns	Looking for Patterns	Looking for Patterns	Looking for Patterns	Looking for Patterns	Looking for Patterns
	Simplify	Simplify	Simplify	Simplify	Simplify
		Working backwards	Working backwards	Working backwards	Working backwards
		Make a List or table	Make a List or table	Make a List or table	Make a List or table
				Algebraic	Algebraic

Looking for Patterns

Solve a problem by looking for patterns, repetitions or sequences in the data.

Simplify

When a problem is too complex to be solved in one step, it often helps to divide it into simpler problems and solve them separately.

Working backwards

Starting with the end in mind helps you develop a strategy that leads to the solution by backing through the process.

Algebraic

Where equations or formulas can help to make the solution clearer.