

Keira's reflection

Educator Story

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Last year I decided to look closely at the structure of our mathematics learning and made changes to the pedagogical approach in order to focus on increasing the level of 'Mathematical Resilience' in our learners, in particular when problem solving.

I decided that I would make the students explicitly aware of the attributes of a resilient learner.

At the very beginning, students would participate in a problem solving task and I would observe their attitudes towards the task, the strategies that they used and the quality of their responses. Often students would appear confused about how to begin, unsure of what was required of them and unaware of what they could use around them to help assist their working out. They would often respond quickly when faced with a problem by saying "I don't know how to do it."

The problem solving structure that I have adapted is from Ann Baker's Natural Maths Strategies. The problem that we solve connects to the current mathematical concept that we are learning at the time and provides a way of recording and sharing the learning that the students have achieved. At the same time of using this approach to learning we were also reflecting on the strategies that we used as learners, particularly focusing on the Resilient Factors. We started to brainstorm good strategies that we were using and those that we saw other people doing and added to our list over time. We connected these strategies to being a successful and persistent mathematical learner on the foundation that:

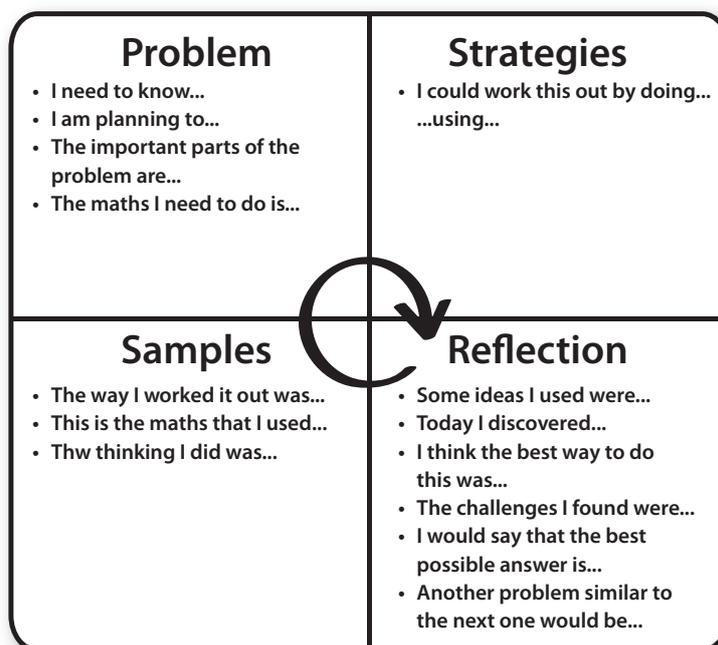
When mathematically resilient pupils are required to use mathematics in a new situation they will expect to find it hard at first but will have strategies or approaches to overcome the initial "can't do it" response.
(Johnston-Wilder S & Lee C)

We mapped out our problem solving learning on a board in the classroom under the four headings of Problem, Strategies, Samples and Reflection (see image below) with student work and responses underneath. At the same time, our Resilience Board was also added to as we picked up and noticed new and effective strategies to use when learning. At the end of each problem solving session students had to report back what they had found, articulate how they worked it out (what approach did they take?) and what resilient strategies they used. The brainstorming board was also flexible; and if there were strategies up there that we didn't often use, or moved on from, or didn't find effective, they would be removed. Our initial thoughts on what resilience looked like changed over time as we experienced what it was like to be resilient ourselves.

Over time students acquired new vocabulary to speak about their engagement, resilience and learning and were able to identify their own resilience when learning mathematically. This had a positive impact on the quality of their learning, their confidence, their ability to work with other people, and their attention and ability to reflect on their thinking. They were able to understand and work through difficult problems that they would have initially said were "too difficult".

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They also began to formulate their own questions to solve with the ability to understand what came next in their learning and how to extend their skills and understandings. Students developed a strong repertoire of strategies that they were able to call upon when faced with a problem.



Finding 3.4: Resilience

Explicitly help learners develop and maintain positive attitudes to mathematics. Develop positive dispositions, resilience, and skills that equip learners to solve problems whatever the context.