

## reSolve: Mathematics by Inquiry Professional Learning Modules

### Summary of modules

#### Module 1: The reSolve Protocol

In this module, teachers will engage with the philosophy, purpose and structure of the reSolve: Mathematics by Inquiry project. They examine a sequence of lessons, reflect on the documentation and design features evident in the sequence, and compare this with their current practice. The module introduces the reSolve: Mathematics by Inquiry Protocol, which outlines the principles underpinning the development of all the reSolve resources.

#### Module 2: Mathematical purpose and potential

This module focuses on the mathematical purpose and potential of tasks. The purpose is defined as the goals of students' learning and the actions in which students are intended to engage. The mathematical potential is defined as the possibilities that go beyond the specific purpose and can include the range of possible responses, generalisations, alternate representations and connections across domains. During the module teachers work through a selection of tasks and identify the purpose and potential of tasks. The intention is that by working through tasks, discussing them and reflecting on the intentions of the task designers, teachers will think about the processes of task selection, planning and enactment generally, beyond the specific tasks that are the focus of the module.

#### Module 3: Including all students in mathematics learning experiences

All students are different. In any class in any school across the country, this will become apparent as students demonstrate different skills, knowledge, understanding, experience and motivation. This module presents some strategies for helping teachers cater for these differences by questioning some traditional views on differentiation. These strategies promote access and engagement for every student regardless of the perceived differences by using a shared mathematical experience for all; by presenting mathematical tasks that have a "low floor" and "high ceiling"; and by using enabling and extending prompts to help all students engage with a common task.

#### Module 4: The role of challenging mathematical experiences in activating thinking of all students

There are two aspects to module 4. The first presents both a rationale for and examples of challenging tasks from reSolve classroom resources that are accessible to all students and which create opportunities for them to learn mathematics. Of course, students will benefit if teachers allow them time to engage with such challenges and do not tell the students what to do prior to them having an opportunity to engage with the challenge. The second aspect is that teachers can take specific actions to establish the classroom norms that encourage and support students working on the challenges. A key aspect of the module is connecting the proposed strategies to classroom practice.

#### Module 5: Using student strategies and solutions as part of inquiry learning in mathematics

This module examines the purposes and processes for effective use of students' strategies and solutions of mathematics inquiries to enhance their own learning and the learning of others. Assuming that the class has worked on an appropriately differentiated challenging mathematical exploration or investigation without instruction, there are a number of key actions for the

teacher. These actions include anticipation of the strategies students might produce, monitoring the work of students, choosing and sequencing potentially productive solutions for presentation to the class, and formulating summaries that can synthesise the intended learning for the class. The use of their strategies and solutions emphasises to students that their approaches to solving problems and their justifications and explanations are valued.

**Module 6: Leading the incorporation of inquiry approaches into mathematics teaching repertoires: A workshop for current and potential leaders (not yet available for trialling)**

Improvement in the teaching of mathematics and numeracy is a gradual process, that ideally is school based, involving all teachers working collaboratively. Effective leadership is critical. The leader can be a person designated for the task, or it can be an enthusiastic team member. This module is designed to support leaders and potential leaders to lead improvement initiatives. The focus is on the reSolve Protocol, classroom resources and the ways that these can be used as prompts for improvements in teaching practice. The module also examines general principles underpinning school-based improvement initiatives, as well as some specific strategies that have been successful in many schools. Participants are invited to reflect on the implications for their own practice.

**Module 7 (proposed): Activating mathematical thinking then consolidating learning**

One of the goals of reSolve approaches is to engage students in constructing knowledge through consideration of solutions and solution strategies, representing thinking and building connections. The next step is the consolidation of learning through thoughtfully sequenced and varied tasks. Examples of task sequences and lesson sequences will be reviewed to consider ways that the subsequent experiences consolidate learning initiated by the original tasks/lessons.

**Module 8 (proposed): Adapting existing inquiry resources and creating your own**

Classroom resources, special topics and these modules are suggested as prompts to teacher thinking. It is assumed that teachers will adapt the ideas to the level they are teaching and the particular characteristics of their class. This module will explore the processes of adapting existing resources while preserving the intent of the designers of the resource. Further, reSolve includes just eight classroom resources for any one year level. The intention is that teachers can generalise the approach to other mathematical foci. This aspect of the module will suggest six strategies teachers can use to create their own inquiry learning sequences.