



Teaching strategy: Mathematics investigation

Overview:



At its core mathematics is about problem solving and modelling the world around us. By giving students meaningful problems to solve they are engaged and can apply their learning, thereby deepening their understanding. Using a guided investigation model ensures that students stay focused on the mathematics being used and make connections to other areas of learning.

After students have been taught a skill or concept it is important that they apply it in a meaningful context as this will reveal the depth of their understanding. A guided inquiry is one way to do this. By scaffolding the problem, the teacher can lead students through a problem-solving exercise, highlighting the mathematics they need to use. Starting with a prompt, either a picture or a question, students can explore different ways of approaching the problem and communicating their thinking. Mathematics investigations links directly to the [Critical and Creative Capability](#) in the Australian Curriculum.

Investigations can be differentiated by adjusting the complexity of the original problem or the expected outcomes. Investigations can be assessed, and guided, through the use of rubrics.

By using a particular scaffold, or approach, regularly students learn what is expected of them and are able to improve and develop their problem-solving skills. Teachers should explicitly teach how to approach a problem using such a scaffold. Popular scaffolds or protocols for guided investigations include:

- [reSolve](#)
- [Inquiry Maths](#)
- [3-Act Tasks](#)

The teacher:

- Explicitly teaches the mathematics needed for the task
- Explicitly teaches how to use a scaffold or protocol
- Make the learning intention and success criteria clear
- Invites questions and wonderings
- Focuses the students on the mathematical ideas being developed
- Makes connections to students' previous learning
- Makes connections to other subject areas
- Encourages students to work collaboratively
- Monitors students, given specific feedback to guide the students further

The students:

- Know how to use a particular scaffold or approach when working on a maths investigation
- Know how to work collaboratively and respectfully
- Communicate their ideas and thinking clearly



- Ask questions and respectfully respond to other's questions
- Are prepared to struggle and make mistakes in order to make progress in their learning

Example of the strategy in action:

In this video a teacher discusses how they used an investigation to reinforce the students' understanding of estimation and prediction.

<https://www.aitsl.edu.au/tools-resources/resource/thinking-mathematically-illustration-of-practice>