

Thinking, reasoning and working mathematically in the classroom

Teacher's role in promoting thinking reasoning and working mathematically



Teachers:

- develop investigations, problems, questions or issues to be resolved that are of interest to students
- consider the interests, needs and abilities of the learners
- negotiate with students to develop their own investigations
- support student-devised plans and self-directed learning
- encourage students to pose problems
- focus on procedures and strategies to be used
- guide conversations by focusing questions on the mathematics in the situation
- guide discussion and provide opportunities to develop the knowledge, procedures and strategies required
- coach, co-investigate or model
- provide opportunities for self-monitoring and self-assessment
- encourage persistence and reflection
- encourage students to communicate alternative perspectives
- see problems from the students' perspective.

Student's role in thinking, reasoning and working mathematically



Students:

- make meaningful connections with prior knowledge procedures and strategies and prior experiences
- identify what they know and can do with what they know
- identify what it is that they need to know to proceed
- Test new procedures and strategies to see if they work in new situations
- share information about knowledge, strategies and procedures
- conduct experiments and test new ideas
- remain active and self-directed
- persevere with difficult problems, questions or issues.

What does thinking, reasoning and working mathematically look like in the classroom?



Students may be:

- holding mathematical conversations and debates
- planning investigations
- selecting appropriate procedures and strategies
- making connections to prior learning and experiences
- using a range of representations from concrete materials to mathematical models
- communicating mathematical ideas
- challenging the views of other students
- posing problems
- reflecting on the reasonableness of the solutions
- monitoring their learning

Benefits of thinking, reasoning and working mathematically



In a classroom where students are given the opportunity to think reason and work mathematically:

- learning relates to real-world situations
- higher-order thinking is promoted
- thinking and reasoning are valued
- learning how to learn is promoted
- learning is intriguing and engaging
- different approaches can be used to achieve the same result
- students see the learning in mathematics
- perseverance is encouraged.