

Characteristics of an effective numeracy classroom

Environment	The Teacher	The Students
<p>Classroom climate</p> <ul style="list-style-type: none"> reflects the cultural diversity of the class all students are expected to engage in mathematical thinking and to contribute to the class learning community reflects realistic mathematical expectations of all children which promote and value effort, persistence and concentration risk-taking is encouraged students' ideas are valued and they are safe to offer solutions and estimations 'wrong' answers or misconceptions are used as learning opportunities people expect to be challenged and justify their thinking positive attitudes to mathematics are evident <p>Visual elements</p> <ul style="list-style-type: none"> accessible and displayed maths equipment e.g. numberlines, abacus, number charts displayed examples of student's work modelling books and student work books key vocabulary and visual support for mathematical ideas are displayed <p>Organisation</p> <ul style="list-style-type: none"> flexible workspace to support individual, pair and small group work independent activities are accessible to students and appropriate to their needs whole class sessions and small group teaching evident provision of purposeful practice activities that link to prior and current learning 	<p>Interactions with content</p> <ul style="list-style-type: none"> focuses on key mathematical ideas and shares these with students uses real life and appropriate tasks (socially appropriate and cognitively accessible) that reflect the cultural diversity of the class structures purposeful and problematic tasks that enable different possibilities, strategies and ideas to emerge, and encourage cognitive dissonance effectively uses of a range of equipment to model and support the development of mathematical thinking makes connections to prior learning or related mathematical ideas makes links to other mathematics strands and curriculum areas effectively applies the Numeracy Project Teaching Model (material /imaging /number properties) records key mathematical ideas in a variety of ways to support and extend thinking challenges and scaffolds all students to solve difficult problems in a variety of ways promotes the use of alternative and efficient methods to solve problems provides opportunities for cognitive engagement and presses for understanding uses ICT to support learning <p>Interaction with students</p> <ul style="list-style-type: none"> provides opportunities for students to work with and learn from peers in flexible groupings allows students sufficient thinking time listens to and build on students' ideas which develop and extend key concepts promotes the sharing of ideas and strategies supports children to explain their mathematical ideas encourages children to challenge ideas and justify strategies and solutions uses a range of question types to promote higher order thinking, and reflection on learning encourages students to listen and evaluate others' mathematical thinking/ideas provides constructive and timely feedback to promote learning <p>Assessing learning</p> <ul style="list-style-type: none"> provides opportunities for students to reflect on learning collects data through the observation of and listening to children uses a variety of assessment tools planning and teaching reflects assessment information 	<p>Interactions with content</p> <ul style="list-style-type: none"> explore alternative strategies engage in interesting and challenging activities use number sense and estimation express mathematical ideas confidently, both verbally and in written recording use a range of equipment effectively to demonstrate and develop their mathematical thinking record mathematical ideas using diagrams, symbols, and written statements reflect on and assess their own learning <p>Interactions with others</p> <ul style="list-style-type: none"> work purposefully with peers and teachers to solve problems contribute, justify and evaluate thinking to explore strategies and possible solutions willing to challenge ideas and be challenged

References

- Anthony, G., & Walshaw, M. (2007). *Effective pedagogy in Mathematics/Pangarau: Best evidence synthesis iteration [BES]*. Wellington: Ministry of Education.
- Askew, M., Brown, M., Rhodes, V., Wiliam, D., & Johnson, D. (1997). *Effective teachers of numeracy in primary schools: Teachers' beliefs, practices and pupils' learning*. Paper presented at the British Educational Research Association Annual Conference.
- Fraivillig, J.L., Murphy, L.A., & Fuson, K.C (1999). Advancing children's mathematical thinking in everyday mathematics classrooms. *Journal for Research in Mathematics Education*, 30(2), 148-170.
- McDonough, A., & Clarke, D. M. (2003). Describing the practice of effective teachers of mathematics in the early years. In N. A. Pateman, B. J. Dougherty, & J. T. Zilliox (Eds.), *Proceedings of the 2003 Joints Meeting of the International Group for the Psychology of Mathematics Education and the Psychology of Mathematics Education Group North America* (Vol. 3, 261-268). Hawaii: University of Hawaii.