

Excellence in numeracy through the Victorian Teaching and Learning Model

“Numeracy is the knowledge, skills, behaviours and dispositions that students need in order to use mathematics in a wide range of situations.” The Victorian Curriculum and Assessment Authority (2019).

OVERVIEW

This Professional Practice Note provides advice to school leaders and teachers about how to use the Victorian Teaching and Learning Model (VTLM) to establish, enhance or adjust instructional practice to promote excellence and consistency in teaching and learning across the school.

The VTLM provides a framework to review student achievement, reflect on current teaching practices and put in place effective strategies to extend every student's learning.

This Note provides further information on achieving excellence in numeracy through using the VTLM in teaching and learning planning and classroom delivery.

COMPONENTS OF THE VTLM

The VTLM comprises four components that each serve a unique purpose in supporting excellence in teaching and learning:

[A Vision for Learning](#) helps create a unified set of values and beliefs to drive a high performance learning culture. The Vision for Learning states: *All students are empowered to learn and achieve, experiencing high quality teaching practice and the best conditions for learning which equip them with the knowledge, skills and dispositions for lifelong learning and shaping the world around them.*

[The Practice Principles for Excellence in Teaching and Learning](#) (Practice Principles) are nine signature principles that provide the foundation for creating a high quality

learning experience for every student and consequently improve student achievement and motivation. Schools may use this document to reflect on the school's current principles of practice to identify how they can be enriched with the ideas and behaviours described in the Practice Principles.

[The Pedagogical Model](#) describes what effective teaching looks like in the classroom and helps teachers apply the Practice Principles and High Impact Teaching Strategies (HITS) strategically and effectively. Five domains of Engage, Explore, Explain, Elaborate, and Evaluate describe a complete learning experience of a student over a period of time (e.g. a unit of work or a school term), and should not be viewed as a lesson plan. The Pedagogical Model focuses on the development of teaching practice as the main contributor to improved student learning outcomes and supports a responsive approach to student needs and the learning program.

[High Impact Teaching Strategies](#) (HITS) are ten instructional practices that increase student learning when applied consistently and appropriately. These strategies are not exhaustive, and schools may select to use them in conjunction with other effective teaching strategies. Teachers are supported in their practice with professional readings and practical examples. The [Victorian Numeracy Portal](#) offers a range of numeracy related examples of the HITS.

DEFINING NUMERACY¹

Although definitions of numeracy vary, it is broadly accepted that being numerate extends beyond the mastery of basic arithmetic skills (Goos, Geiger, Dole, Forgasz & Bennison, 2019)².

Children and young people are exposed to increasingly sophisticated and refined mathematical understanding, fluency, problem-solving, and reasoning. These proficiencies enable students to respond to familiar and unfamiliar situations by employing mathematics to make informed decisions and solve problems efficiently (VCAA, 2017)³.

Numeracy involves recognising and understanding the role of mathematics in the world and having the dispositions and

strategies for enhancing teaching and learning. Sydney: Allen & Unwin.

³ Victorian Curriculum and Assessment Authority. (2017). Numeracy Learning Progressions.

¹ Department of Education and Training. (2019). Numeracy Guide.

² Goos, M., Geiger, V., Dole, S., Forgasz, H., & Bennison, A. (2019). Numeracy across the curriculum: Research-based

capacities to use mathematical knowledge and skills purposefully. Number, measurement and geometry, and statistics and probability are common aspects of most people's mathematical experience in everyday personal, study and work situations. Equally important are the essential roles that algebra, functions and relations, logic, mathematical structure, and working mathematically play in people's understanding of the natural and human worlds, and the interaction between them.

USING THE VTLM WITH A WHOLE-SCHOOL NUMERACY FOCUS

Schools undertake self-reflection using the [Framework for Improving Student Outcomes](#) (FISO) and interpreting available data. Schools that have identified improving student performance in numeracy as an Annual Improvement Plan (AIP) goal can use the VTLM to plan the steps to achieve this goal.

The VTLM provides a line of sight between whole-school improvement based on FISO and classroom level teaching practice. To evaluate the effectiveness of current teaching and learning practices that support high levels of numeracy within our students, the Practice Principles guide schools to consider all data around student progress, including:

- NAPLAN results
- formative tasks
- teacher judgement
- peer observations
- student survey results
- student and parent/carer feedback.

Schools that identify facilitating improvement of confidence and competence in numeracy learning in their AIPs may consider the FISO priority area of *Excellence in teaching and learning* as the first area for self-reflection, using Reflection Tools for Practice Principles. By undertaking this activity at leadership, curriculum, or Professional Learning Communities (PLC) level, a school will be able to:

- engage in collaborative practice development
- facilitate open conversations about instructional practices
- deepen understandings of the essentials for consistent high quality teaching to improve numeracy learning across the school.

Schools that select Practice Principle 4 *Curriculum planning and implementation engages and challenges all students* are encouraged to consider all actions and indicators for this Practice Principle. Review and update school teaching and learning to ensure a closer focus on numeracy, not only in mathematics, but in other learning areas as well.

For example, through the analysis of student data a school may identify that the learning program does not provide a range of entry points for students to access the mathematics curriculum and is not extending high achieving students. In this case, a greater focus on differentiated teaching and learning that extends all students' numeracy learning may be needed.

Using Practice Principle 4 as a guide, excellence in numeracy teaching will be evident when teachers:

- place student needs at the centre of program planning and delivery, ensuring that every student is successfully building on their current numeracy skills and progressing through the Victorian Curriculum F-10
- co-design with students and implement a scope and sequence of learning in numeracy, building students' confidence, motivation and self-efficacy in numeracy
- regularly review and update learning programs in line with the whole-school curriculum plans, ensuring that numeracy learning is consistently embedded across all learning areas in the ways that enrich students' learning experiences
- monitor learning progress of students and actively seek feedback from parents/carers and colleagues to ensure that differentiated learning programs are meeting each student's needs effectively.

USING THE VTLM IN THE CLASSROOM TO ACHIEVE NUMERACY EXCELLENCE

The VTLM has emerged from current research as well as best teaching practice across Victoria and the world. Teachers will find links between the VTLM and the ideas and guidance produced by the leading researchers in education.

Professor Doug Clarke and colleagues (2002) identified a number of characteristics common to effective teaching of

numeracy in the early years⁴. Consultation with secondary leaders has confirmed the applicability of these concepts in the secondary context.

Characteristics include:

- Focus on important mathematical ideas and make the mathematical focus clear to children (HITS 1: Setting Goals).
- Structure purposeful tasks that engage children and enable different possibilities, strategies and products to emerge (HITS 2: Structuring Lessons).
- Use a range of materials/representations/contexts for the same concept (HITS 4: Worked Examples, HITS 6: Multiple Exposures).
- Use teachable moments as they occur and make connections to previous mathematical experiences (Pedagogical Model, Explore domain).
- Use an introductory whole group activity to engage children and then a variety of individual and group structures within the lesson (Pedagogical Model, Engage domain).
- Use a range of question types to probe and challenge children's thinking and reasoning and encourage children to explain their mathematical thinking/ideas (HITS 7: Questioning).
- Have high, but realistic expectations of all children (Practice Principle 1: High expectations for every student promote intellectual engagement and self-awareness).
- Use reflection to draw out key mathematical ideas during and/or after the lesson (Pedagogical Model, Elaborate domain).
- Use a variety of assessment methods and adjust planning as a result of assessment (Practice Principle 6: Rigorous assessment practices and feedback inform teaching and learning, Pedagogical Model, Evaluate domain, HITS 8: Feedback).

- Display confidence in their own knowledge of mathematics at the level they are teaching and a belief that mathematics can and should be enjoyable (Practice Principle 7: Evidence-based strategies drive professional practice improvement).

Teachers are encouraged to work collaboratively to explore how these ideas and principles can be embedded in their numeracy teaching. To navigate the VTLM effectively, teachers can refer to the Domains overview, published in the Pedagogical Model booklet (p. 13), which shows alignment between all components of the VTLM.

Using this mapping, teachers will be able to align their school's AIP goals and FISO priority focus with their own instructional approach and day-to-day classroom instruction.

ADVICE FOR TEACHERS

Familiarise yourself with the VTLM resources

The VTLM supports teachers in their professional development, and provides tools that can be used to:

- reflect on student learning and own teaching
- facilitate collaboration with colleagues within and across schools
- streamline planning of learning programs
- develop performance and development plans.

Focus your practice

To ensure that the VTLM components are used effectively, teachers can undertake the activity below:

- Use the Pedagogical Model to review the content of all five domains.
- Based on your self-reflection, select a domain for your current area of focus.
- Use the continuum of practice for this domain to identify where your skills and behaviours in teaching numeracy currently fit on the progression criteria and where you would like to progress next.
- Choose 1-2 progression criteria, consider the steps needed to move to the next level, including using HITS to support your growth.

⁴ Clarke, D., Cheeseman, J., Gervasoni, A., Gronn, D., Horne, D., McDonough, A., Montgomery, P., Roche, A., Sullivan, P., Clarke,

B., & Rowley, G. (2002). Early numeracy research project final report. Melbourne, VIC: Australian Catholic University

- Share your responses with your colleagues and PDP mentor. Reflect on your progress at mid- and end-of-cycle PDP review.

This activity may also be undertaken for HITS with the self-reflection against the Continuum being completed for whole school or individual teachers.

Work in Professional Learning Communities and Communities of Practice (CoPs)

The VTLM provides common language to schools, enabling teachers to collaborate with colleagues within their school and across schools. Although specific school contexts will differ from one school to another, the VTLM offers common principles and strategies that support numeracy teaching.

Professor Robyn Jorgensen (2018)⁵ identified common threads to promote numeracy learning in remote regions, and these suggestions are applicable in a variety of school settings:

- Identify the needs of the students and target teaching to meet these needs.
- Have a clear vision of the school's culture, and share this with the community.
- Enable staff and students to meet goals and to enact the vision.
- Be explicit about the intent of learning and what is expected of the students.
- Teach in a culturally responsive way that strengthens bridges between home and school, and is focused on the language of mathematics.
- Have high expectations and prioritise learning in mathematics.
- Help students see a purpose for numeracy.

The VTLM can be used as a resource to bring these suggestions to life through a PLC/CoP approach to developing teachers' professional practice, planning and delivery of differentiated learning programs in numeracy.

ADVICE FOR SCHOOL LEADERS

Reflect on the whole-school pedagogical approach

The VTLM describes what excellence in teaching and learning looks like, and provides tools to enact FISO at the classroom level. School leaders can use the VTLM to guide discussions with staff around current instructional practices in numeracy, and about the ways that the VTLM can support purposeful teacher collaboration across learning areas to improve students' numeracy learning.

The following activity can be used to start self-reflection at the whole-school level:

- Select the FISO Priority Area as identified in your AIP that links closely to the school's goals in numeracy.
- Select a [Practice Principle](#) that supports the school's numeracy goal.
- Give each member of the team a copy of the whole-school reflection tool for the specific Practice Principle. Familiarise the team with the *Theory of Action* and *Actions and Indicators*.
- Measure your school's approach to achieving numeracy excellence against the actions and indicators.
- Make note of which Action/s could be improved.
- Share your responses considering the similarities and differences between your team members' reflections.
- Plan your school's next steps, specifically how to address the Action/s that could be improved. This could include targeted professional development, greater differentiation, or developing a whole-school process to support moderation.

⁵ Jorgensen, R. (2018). Celebrating Success: Numeracy in Remote Indigenous Contexts: Final Report. Canberra: University of Canberra.

ILLUSTRATIONS OF PRACTICE

Case study: Vermont Secondary College is a large, single campus, co-educational secondary college of approximately 1,400 students in the eastern suburbs of Melbourne. The development and success of the Year 10 maths extension program reflects the importance of high expectations of students and a supportive and productive learning environment in achieving excellence in numeracy. The Vermont Secondary College program illustrates the VTLM in practice, particularly the Practice Principles for Excellence in Teaching and Learning.

RESOURCES AND TOOLS

[Framework for Improving Student Outcomes](#) (FISO)

[Victorian Teaching and Learning Model](#) (VTLM)

[A Vision for Learning](#)

[The Practice Principles for Excellence in Teaching and Learning](#)

[The Pedagogical Model](#)

[High Impact Teaching Strategies](#)

[Practice Principles Reflection Tools](#)

[Victorian Numeracy Portal](#)

For more information or to share your feedback, please email: professional.practice@edumail.vic.gov.au.