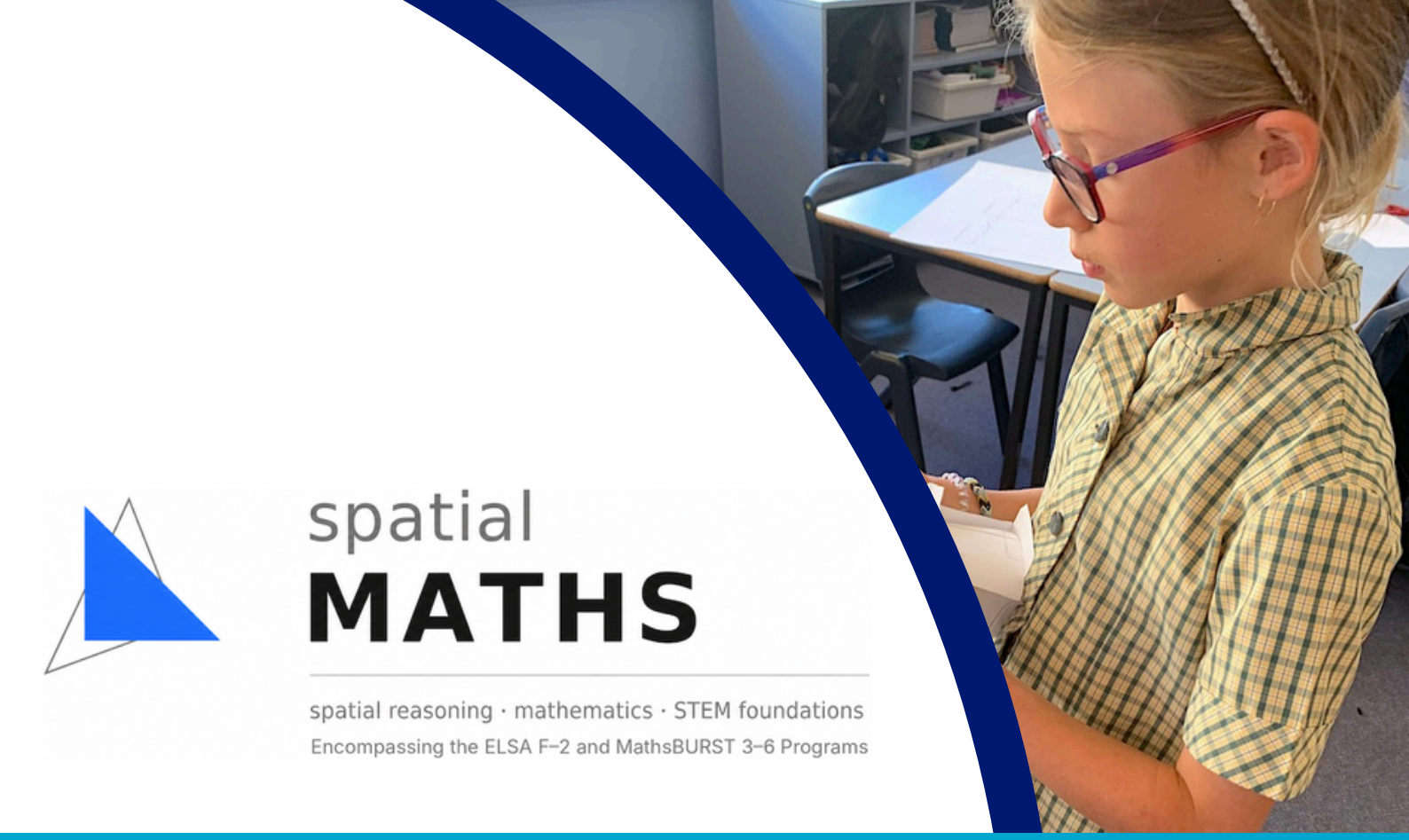


spatial
MATHS

spatial reasoning · mathematics · STEM foundations
Encompassing the ELSA F–2 and MathsBURST 3–6 Programs

Improving Maths Achievement Through Spatial Thinking: Foundation to Year 6

Australian Government
Department of Education

UNIVERSITY OF CANBERRA

ELSA
STEM in Schools

BURST

PREPARED BY :

Centenary Professor Tom Lowrie
September 2026

The ELSA F–2 Program ('STEM in Schools') was developed with Australian Government funding.

The MathsBURST 3–6 Program was developed independently by Professor Tom Lowrie.

spatial
MATHS

spatial reasoning · mathematics · STEM foundations
Encompassing the ELSA F–2 and MathsBURST 3–6 Programs

Spatial Maths is a primary school mathematics program that lifts student numeracy outcomes, STEM engagement and NAPLAN results by building spatial reasoning skills. Results from Foundation to Year 6 show consistently stronger outcomes for Spatial Maths students than for 'business-as-usual' cohorts (see chart below).

The program is designed for low-burden delivery: just one lesson per week, with all lesson plans, student digital games and classroom activities provided and managed through our online portal (LMS). This combination of structured resources and engaging digital technology is designed to:

- improve maths achievement
- reduce teacher workload
- improve STEM engagement

Spatial Maths was developed by Emeritus Professor Tom Lowrie, a world-leading researcher in mathematics and STEM education, together with pedagogical experts at the University of Canberra, and has been funded by the Australian Government Department of Education since 2016.

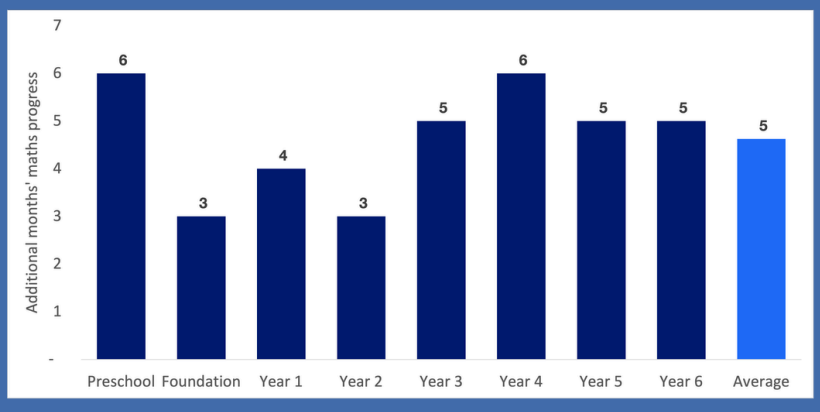
Having completed our research and development phase, we are now transitioning from a government-funded research project to a commercial venture. We have established SPLAT-maths Pty Ltd to deliver the program to schools and secure its long-term sustainability. More information on SPLAT-maths Pty Ltd is available at splatmaths.com.au.

This prospectus outlines the:

- program's benefits to schools, teachers and students
- digital games and challenges for students
- STEM practitioner units
- online portal (LMS) and its functionality

Significant numeracy improvement across F–6

Additional month's numeracy progress beyond control group



- Average student growth above control = 5 months
- Average effect size growth above control = 0.4
- Statistically significant differences in maths performance, controlled by pre-test maths scores
- Maths improvement was more than double that of students not involved in program

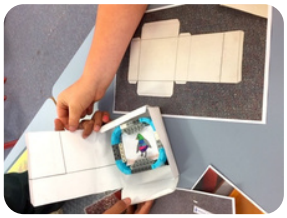
spatial
MATHS

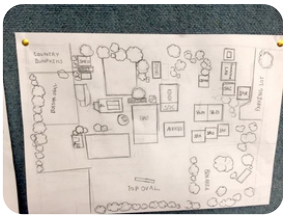
spatial reasoning · mathematics · STEM foundations
Encompassing the ELSA F–2 and MathsBURST 3–6 Programs

Australian Government
Department of Education

UNIVERSITY OF CANBERRA

Improving maths achievement With spatial thinking: Foundation to Year 6





Boost students' Maths skills

The Spatial Maths program boosts primary school students' numeracy, spatial thinking and digital literacy.

Discover the benefits of Spatial Maths

For Schools

Numeracy growth

Substantial, measurable growth in numeracy, with outcomes validated through NAPLAN results — evidence that the program delivers consequential academic gains for students. See bar graph below.

Curriculum coverage

Comprehensive coverage of the space, measurement and algebra strands, ensuring considerable breadth and coherence across the Australian curriculum V9.

Tested and proven

Rigorously evaluated under randomised control conditions — the gold standard in educational research — providing a robust evidence base that is rare.

For Teachers

Easy to implement

Just 60-90 mins of weekly class time. 40 teacher-friendly prepared and sequenced lesson plans for a whole school year (one per week). Student and class management. All within our online portal (LMS).

Real-time assessment

Real-time formative assessment embedded throughout, providing teachers with immediate insights into student progress and achievements.

Online PL and Help Desk

Online professional learning videos, Quick Start guides, How To videos, and access to a Help Desk for technical assistance and program enquiries.

For Students

Fun digital challenges

Online interactive games and challenges for students that develop spatial reasoning skills and reinforce learning in classroom-based activities.

Engaging classroom activities

Hands-on classroom activities that further develop spatial reasoning skills and allow students to apply learnings from the digital games.

Be a STEM practitioner

Students learn about STEM practitioners by undertaking integrated units that draw on spatial skills developed throughout the program, and applying them within real-world contexts.

What teachers say about the program

'The scaffolding in the online aspect of the program was fantastic. Students were able to independently work giving them a sense of real achievement in not having to ask for clarification all the time ... I had a lot of "I did it myself" feedback.'

Annette Mackay
Year 2 Teacher

'It has benefited my students as they engaged more in technology. This links to our curriculum in all areas (especially maths).'

Renee Hall
Foundation Teacher

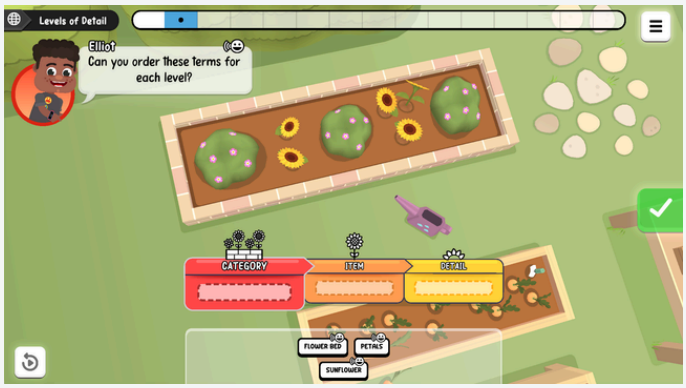
Visit our website to find out more:
splatmaths.com/spatial-maths
email: team@elsa.edu.au

F–6 Digital Games & Challenges

- Foundation Year – 16 digital games
- Year One – 16 digital games
- Year Two – 17 digital games
- Year Three – 8 digital challenges
- Year Four – 8 digital challenges
- Year Five – 8 digital challenges
- Year Six – 11 digital challenges

Foundation Year

Spatial Ordering – Location & Transformation
Computational Thinking: Abstraction – Patterns



Year One

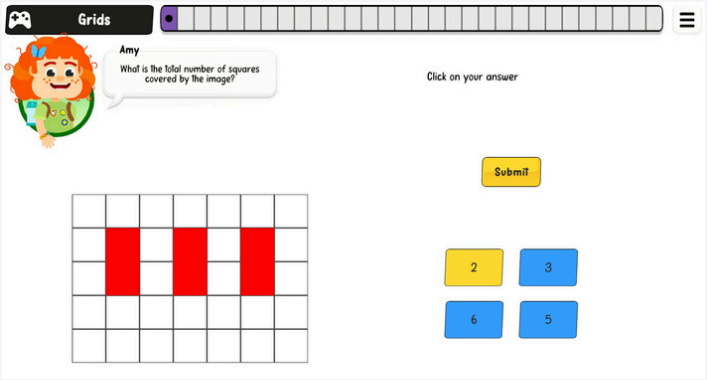
Decoding Data & Information – Spatial Measurement
Sequencing & Decision-Making – Mechanical Reasoning/Simple Machines

Year Two

Debugging – Spatial Transformations: Linear Movements & Rotations
Graphic Languages – Fractions

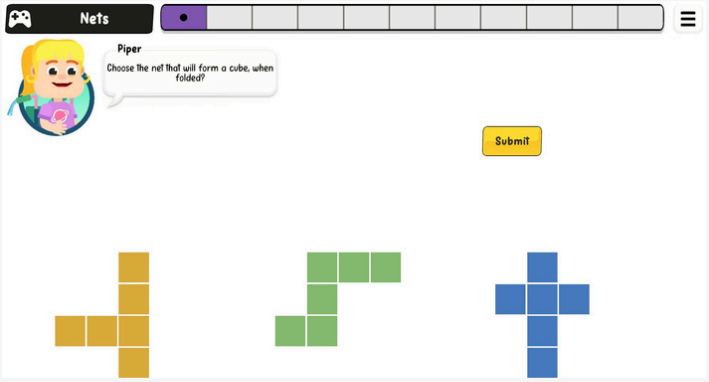
Year Three

Shapes – Grids



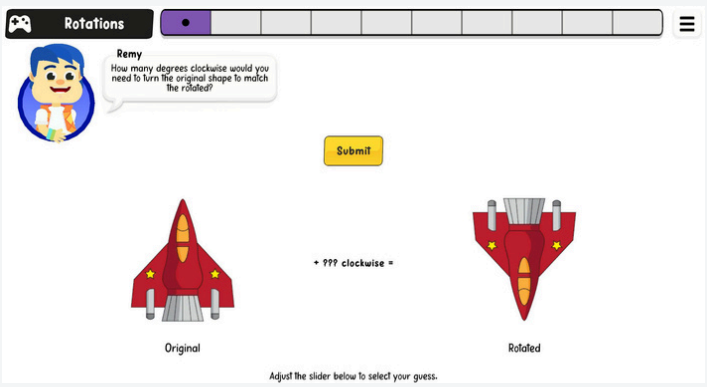
Year Four

Reflections – Nets



Year Five

Rotations – Blocks



Year Six

Perspective – Maps

Be a STEM Practitioner (Units)

For each year level, we have created a 10-week inquiry-based STEM Practitioner Unit.

These units allow students to learn new STEM skills and implement STEM Practices.

In doing so, students discover that these skills and practices are applied in many different occupations that are not traditionally thought of as STEM-based jobs.

Foundation Year: Becoming a Zoologist

- Position and direction language to describe location
- Sorting and classifying by visual features
- Mapping a familiar space using invented symbols
- Perspective taking: imagining a bird's-eye (drone) view

Year 1: Becoming a Park Ranger

- Position, direction and distance language to describe an environment
- Reading, drawing and interpreting maps with a legend
- Decoding and encoding symbols and safety signs
- Representing data spatially: 2D picture graph

Year 2: Becoming Sound Technician

- Locating and describing sound using position and direction words
- Recognising 2D shapes and 3D objects within musical instruments
- Representing sound with symbols on a sound map, graphic score and timeline
- Creating stage plans: performer versus audience perspective

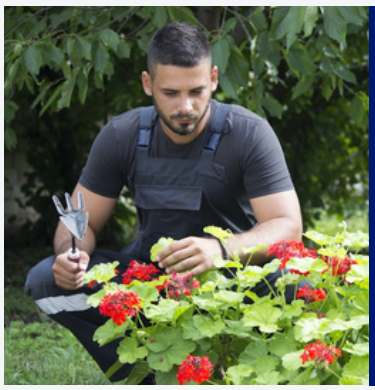
Year 3: Becoming an Interior Designer

- Composing and decomposing shapes
- Layering, arranging, tessellating and iterating shapes
- Visual arrays
- 3D block counting

Year 4: Becoming an Industrial Designer

- Systematic manipulation of shapes and images (e.g. folding/unfolding paper and paper engineering)
- Symmetry and reflections
- Cross-sections of 3D objects
- Shifting dimensions from 2D to 3D and vice versa
- Translations and scaling

Year 5: Becoming a Horticulturalist



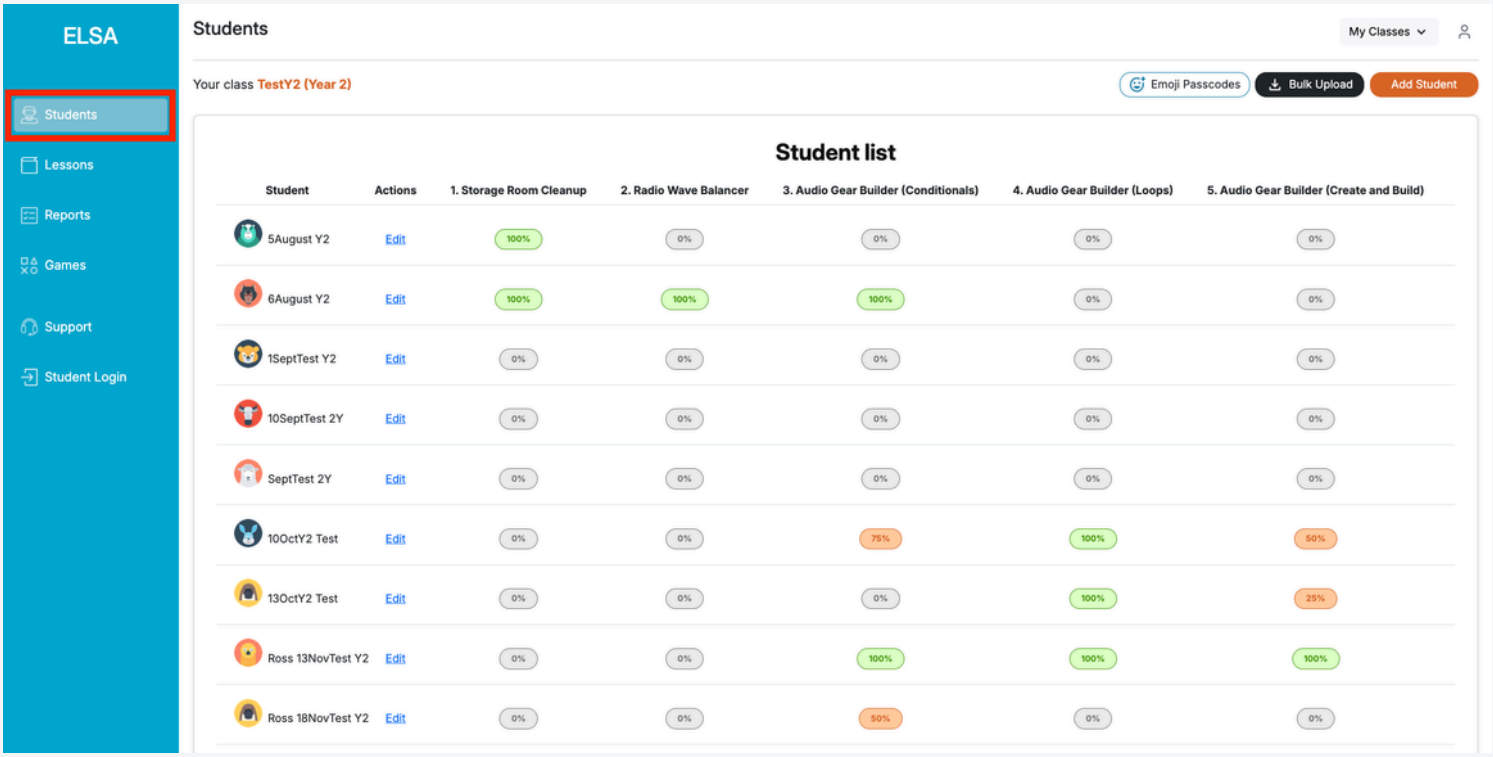
- Jigsaw puzzles
- 2D rotations on the plane: quarter/half turns, clockwise/anticlockwise
- 2D rotations by degrees: 45° anticlockwise understanding 3D equivalence
- 3D rotations around the X, Y and Z axes
- Rotations but not reflections

Year 6: Becoming an Architect

- Navigating using cardinal and relative directions
- Reading, drawing and interpreting maps; including different orientations
- Visual perspective taking: putting yourself in someone else's shoes
- Orthogonal views: front, top, side
- Close links with geography, physical education and sport

Our online portal (LMS) provides full program management for teachers

Real-time assessment of student learning



Student progress data