# Numbers in Play:

## Building Foundations for Early Mathematical Mastery


### OVERVIEW

*Numbers in Play* is a practical and research-informed workshop that recognises, extends, and celebrates children's natural mathematical thinking in play. Rather than viewing numeracy as a set of rote skills, the workshop reframes mathematics as something children actively construct through exploration, problem-solving, language, and relationships. Educators unpack the building blocks of mathematical cognition and learn how these emerge organically in play when environments and interactions are intentionally designed.

The workshop also supports educators to integrate mathematical learning into project work, inquiry, routines, and spontaneous moments in ways that are meaningful and joyful for children. Educators discover how language, conceptual development, schematic play, and hands-on experiences create the foundations for lifelong mathematical confidence. The workshop ensures numeracy learning becomes accessible to all children, including those with diverse needs, developmental profiles or learning dispositions.

### WE WILL...

- Explore how young children build mathematical understanding through physical, social and logical-mathematical experiences.
- Unpack precursor mathematical concepts and what they look like in real play, projects and inquiry-based learning.
- Examine the powerful relationship between language, communication and early numeracy.
- Explore schematic play and identify the "maths within the mess" of children's natural patterns and investigations.
- Consider mathematic learning through an emotional lens, using the Phoenix Cups to support children's confidence, curiosity and sense of safety.

**DELIVERY MODE OFFERINGS:**

1. Self-paced online course
2. Face-to-face workshop (up to 2.5 hours)
3. Live online webinar

**Contact us to book your workshop HERE.**

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## PARTICIPANT OUTCOMES

By the end of this workshop, participants will posess:

1. Greater confidence in recognising and embedding precursor mathematical concepts into everyday practice.
2. Inspiration to design numeracy-rich environments that nurture play, curiosity and discovery.
3. A deeper understanding of children's cognitive development across logical, physical, social and mathematical domains.
4. Practical strategies to embed mathematics meaningfully across projects, routines and learning experiences.
5. Insight into the literacy–numeracy connection and how communication strengthens mathematical thinking.

## THEORETICAL UNDERPINNINGS

### Precursor Mathematical Concepts
**Mary Hynes-Berry, Jie-Qi Chen & Barbara Abel**

The foundational cognitive skills children develop before formal mathematics. These early concepts emerge naturally through play and provide the essential building blocks for later numeracy learning.

### Piaget's Constructivist Theory
**Jean Piaget**

Children construct mathematical knowledge through active exploration, forming concepts through hands-on experiences. This directly aligns with using play as the foundation for mathematical thinking.

### Schematic Play
**Chris Athey**

Children use repeated patterns of behaviour (schemas) to build cognitive structures. The workshop links schema play (e.g., rotation, trajectory, enveloping) with mathematical foundations.

### Pedagogical Narration / Learning Stories
**Margaret Carr & Wendy Lee**

Observing and documenting numeracy in play deepens educator intentionality and supports rich learning conversations. This aligns directly with the workshop's focus on helping educators recognise and articulate the mathematical thinking already present in children's play.

**Read more on *How to Explore Maths in the Early Years* on the Phoenix Support for Educator's blog HERE.**

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## KEY LINKS - NATIONAL

### Alignment with National Quality Standard

- **QA1 –** Educational Program and Practice (Elements 1.1.3, 1.2.1, 1.2.2): supports intentional, responsive teaching and the integration of mathematical thinking through play.
- **QA3 –** Physical Environment (Element 3.2.1 & 3.2.2): promotes rich, inclusive environments that encourage exploration, problem solving and discovery.
- **QA5 –** Relationships with Children (Element 5.2.1): strengthens collaborative learning, shared thinking and co-construction of knowledge through mathematical investigations

### Alignment with Australian Professional Standards for Teachers

- **Standard 1.2** – Know learners and how they learn: deepens understanding of children's cognitive and mathematical development.
- **Standard 2.5**- Apply knowledge and understanding of effective teaching strategies to support students' literacy and numeracy achievement.
- **Standard 3.3** – Plan for and implement effective teaching and learning: strengthens intentional, evidence-informed numeracy practice.

### Alignment with EYLF v2.0

**Principles**

- Secure, respectful and reciprocal relationships: educators build trust so children feel confident to explore mathematical ideas.
- High expectations and equity: numeracy learning becomes accessible for all children through differentiated, play-based experiences.

**Practices**

- Learning through play: central to identifying and extending mathematical thinking as it naturally emerges.
- Intentional teaching: educators purposefully model language, pose questions and enrich environments to support mathematical concepts.

**Learning Outcomes**

- Outcome 4 – Children are confident and involved learners: strengthens problem-solving, investigation and reasoning.
- Outcome 5 – Children are effective communicators: deepens mathematical language, symbols, representation and shared meaning-making.

### Alignment with National Principles for Child Safe Organisations

- **Principle 1** – Child safety and wellbeing are embedded in organisational leadership, governance and culture: the workshop promotes environments where children's ideas, questions and agency drive the learning.
- **Principle 3** – Children are involved in decisions affecting them: numeracy learning is co-constructed with children, ensuring their perspectives shape the learning process.

## KEY LINKS - QLD

### Alignment with the Kindy Uplift Key Priority Areas

**Mathematics and Numeracy**
- Directly supports children's development of number sense, patterning, spatial reasoning, measurement, comparison, and classification.
- Builds educator capability to recognise, document, and extend mathematical thinking as it emerges in play.
- Ensures numeracy is meaningful, playful, hands-on, and accessible to all children.

**Language and Literacy**
- Strengthens mathematical language including building strong links between communication, vocabulary and early mathematical concepts.
- Encourages children to verbalise reasoning, explain ideas, and engage in sustained shared thinking.
- Links storying, narrative, and vocabulary to foundational mathematical concepts.

**Social and Emotional Learning**
- Builds children's confidence and persistence as they tackle mathematical challenges through play.
- Encourages collaborative problem-solving, negotiation, turn-taking, and shared thinking.
- Creates emotionally safe spaces where children feel secure experimenting, making mistakes, and trying new strategies.

**Executive Function**
- Builds working memory, planning, sequencing, and cognitive flexibility through play-based multi-step mathematical investigations.

### Alignment with QKLG

**Identity**
- Strengthens children's sense of themselves as capable mathematical thinkers through success, agency, and opportunities to lead their own investigations.
- Encourages children to share ideas, theories, and strategies, promoting pride in their thinking and problem-solving processes.
- dence, agency and sense of self through attuned, respectful, needs-focused interactions.

**Active Learning**
- Deepens children's curiosity, focus, and persistence through hands-on mathematical inquiry embedded in everyday play.
- Strengthens early reasoning, investigation, and experimentation by offering open-ended materials that invite sorting, comparing, sequencing, building, and pattern-making.

**Communicating**
- Supports children to express, explain, compare, and negotiate ideas using mathematical vocabulary, gestures, representations, and symbols.
- Encourages meaning-making through conversations, storytelling, and shared thinking that link language to number, pattern, space, shape, and measurement.

## KEY LINKS - VIC

### School Readiness Funding Menu

Please note this workshop is not on the SRF menu. It can however be utilised under flexible funding provisions. For more information on flexible funding go to the Victorian Department of Education website here:

For more information on the Phoenix Support SRF offerings, including those on the menu as well as flexible funding options, head to our website here:

### Alignment with the SRF Priority Areas for use under Flexible Funding Options

**Communication (language, literacy and numeracy)**

- Strengthens children's mathematical language by supporting vocabulary for comparison, quantity, patterning, spatial concepts, and reasoning.
- Links oral language and literacy practices to the development of early numeracy by embedding storytelling, questioning, and meaning-making into mathematical play.

**Wellbeing (social, emotional and executive function)**

- Builds persistence, confidence, and resilience as children explore mathematical challenges through open-ended play.
- Fosters emotionally safe environments where children feel secure experimenting with mathematical ideas and engaging in collaborative learning.

**Access, Inclusion and Participation.**

- Ensures all children can access numeracy learning through multiple pathways, materials, and play types tailored to diverse needs.
- Promotes inclusive practices by valuing cultural, linguistic, developmental, and experiential diversity in mathematical thinking.
- Encourages active participation by designing environments that invite exploration, questioning, constructing, sorting, and patterning for every child.

### Alignment with the VEYLDF

**Practice Principles**

- Respectful Relationships and Responsive Engagement: supports attuned, co-constructive interactions where children's thinking is valued.
- Integrated Teaching and Learning Approaches: blends child-led exploration, guided play, and intentional teaching in numeracy.
- Assessment for Learning and Development: strengthens documentation and observation of mathematical learning in play.

**Learning Outcomes**

- Outcome 4 – Children are confident and involved learners: fosters curiosity, investigation, reasoning and problem-solving.
- Outcome 5 – Children are effective communicators: develops symbolic thinking, mathematical language and expressive communication.