

# wondering about wonder

What exactly is a sense of wonder, what evokes it and how do we encourage it? At the Federal Community Children's Centre in NSW, a study in spirals, sparked by something as simple as a fern unravelling, helped educational leader **Linda Watson** to realise that some natural phenomena are particularly powerful in evoking wonder in children.

The study of spirals began during the COVID-19 lockdown. A very small group of children (about 12 of 35) were still attending the centre. During a walk into our bushland area, we discovered a fern frond unravelling. The children were fascinated by this and initially used the word 'swirl' to describe the pattern. After a group discussion they embraced the use of 'spiral'.

Visual displays around the centre encouraged the children to notice naturally occurring spirals. These included possums' tails, seashells, octopus legs, coiled snakes, pinecones and many others. This was consolidated with sharing these images with the children at home via our daily zoom session. It was apparent, due to the interest that arose, that something about the spiral shape resonated with the children.





On a second nature walk the children were asked to look out for spirals. The response was stunning. Almost every child found something with a spiral component. They shared these with enthusiasm and wonder. As a group, we took photos and shared them with our friends at home on our Facebook page. We asked parents to collaborate with the children at home and see if they too could find spirals in their gardens. The children demonstrated an extraordinary level of engagement with this activity and parents' responses were extremely positive:

*It was just perfect; we saw it on the page and were straight into the garden finding spirals everywhere. Months later, not a day goes by without Luna finding a spiral somewhere (Jess).*

A second parent commented on how her daughter insisted upon stopping and collecting any spirals on their daily walks, often insisting on sending me a photograph.

*This thing has really resonated with Delilah (Matt).*

Continuing with the interest in spirals, we used masking tape to make a huge spiral on the floor. The children explored this in a variety of ways, driving toy cars along it, balancing while walking along the spiral and using their bodies to measure it. They began drawing spirals and cutting them out, delighting in the unravelling as they cut. Spirals began to appear in the artwork of many children from our three-year-olds to our five-year-olds.

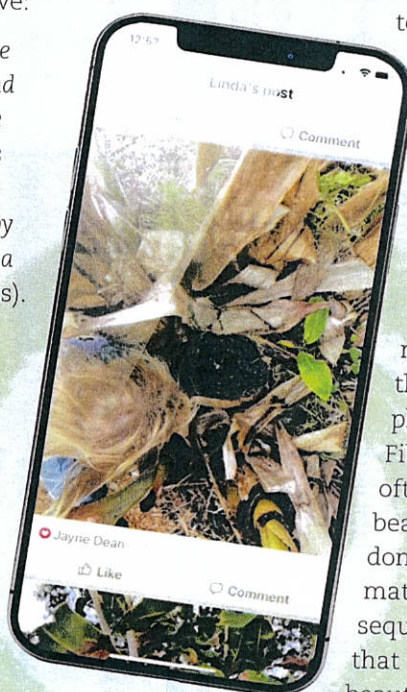
The children were so engaged in identifying spirals that every day they identified more and more of them in nature. Sometimes the spirals they found were extremely small. This led to a learning opportunity with the use of technology, as we used the iPad to photograph and then enlarge the photos to confirm that some very small objects were actually spirals. As well as in nature, the children explored spirals in architecture and art.

As a result of this experience, the children have developed the disposition to look closely at things and seek out patterns in the natural world. This intense interest begs the question, is there something about the spiral that elicits wonder and curiosity?

The spiral is a manifestation of the mathematical phenomena of the Fibonacci sequence, often associated with beauty. While children don't understand the mathematics of this sequence, could it be that this mathematical beauty stimulates the brain in particular ways

and that children are hardwired to appreciate this beauty?

Researchers have determined that the perception of a mathematically beautiful formula evokes a similar brain response in mathematicians as the perception of great works of art (Gallagher, 2014). This suggests that the perception of beauty has neurological roots and may be hardwired. Other studies show that very young children and adults share a preference





for fractal patterns (a spiral is a fractal pattern). This preference is determined before the age of three, giving weight to the argument that it is innate (Barlow, 2020; Falk & Balling, 2009). Are our children hardwired to appreciate the mathematical beauty of spirals, especially those that exist in nature? The identification of patterns elicits a chemical reward to the brain (Gallagher, 2014). Does this chemical reward feel like a sense of wonder?

Fostering a 'sense of wonder' in young children is prominent in Learning Outcome 4 of the *Early Years Learning Framework (EYLF)* (DEEWR, 2009, p. 37). It is, however, often intangible and elusive. This study in spirals was particularly effective in stimulating wonder and interest and the disposition to look closely at the world. We speculate that children may innately be drawn to mathematical beauty and thus encourage teachers to investigate mathematical patterns in nature such as symmetry, ratios and recurring patterns as a way to encourage a sense of wonder in children.

Our role as educators 'is not for the adult to teach but to see the world from the child's perspective and to cultivate the emotions and senses of discovery and observation' (Carson, 1956).

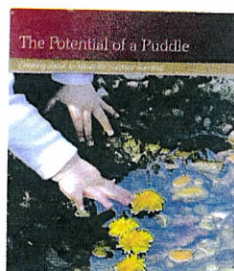


Photo: Clair McDonald

#### References

- Barlow, J. (2020). *Study finds that by age 3 kids prefer nature's fractal patterns*. Retrieved 17 November 2020, from <https://its-interesting.com/2020/12/11/study-finds-that-by-age-3-kids-prefer-natures-fractal-patterns/>.
- Carson, R. (1956). *The sense of wonder: A celebration of nature for parents and children*. New York: Harper Collins.
- Department of Education, Employment and Workplace Relations (DEEWR). (2009). *Belonging, Being and Becoming: The Early Years Learning Framework for Australia*. Canberra, ACT: Commonwealth of Australia.
- Falk, J., & Balling, J. (2009). Evolutionary influence on human landscape preference. *Environment and Behavior*, 42(4), 479–493. doi: 10.1177/0013916509341244
- Gallagher, J. (2014). *Mathematics: Why the brain sees maths as beauty*. BBC. Retrieved from [www.bbc.com/news/science-environment-26151062](http://www.bbc.com/news/science-environment-26151062).

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