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Leadership
content
knowledge:
*What do
maths leaders
need to know?*

Nadia Walker

Pedagogical content knowledge

Leadership content knowledge



The kind of knowledge that will equip Principals (and other school leaders) to be strong instructional leaders we will call leadership content knowledge. Standing at the intersection of subject matter knowledge and the practices that define leadership, this form of knowledge would be the special province of principals and others charged with the improvement of teaching and learning.

We define leadership content knowledge as that knowledge of subjects and how students learn them that is used by leaders when they function as instructional leaders.

[Leaders] ... must not only be capable of providing a pedagogical vision for teachers, but also have the knowledge, skills, and strength of character to hold teachers accountable for enacting it.

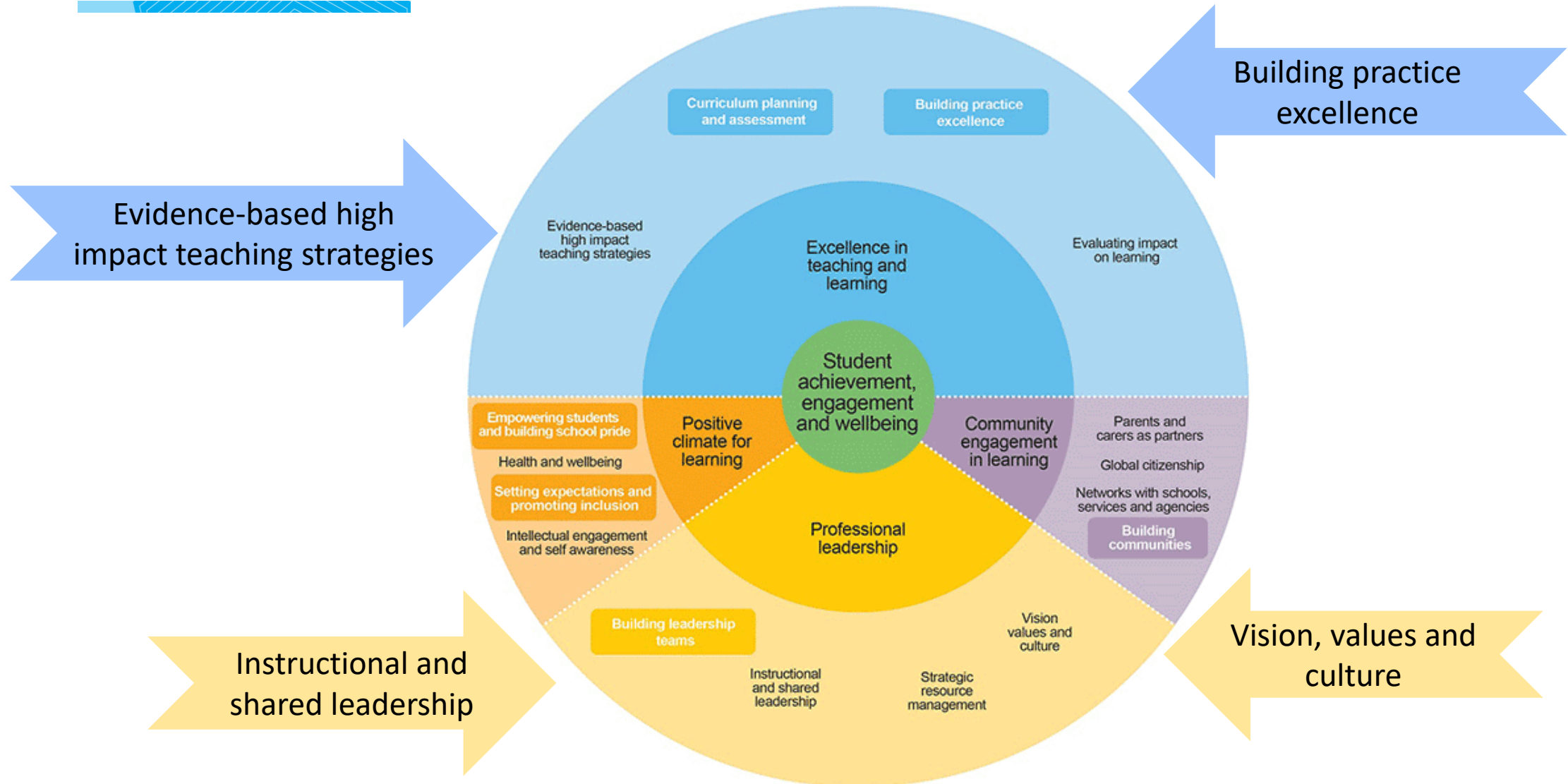
Leadership content knowledge: What do leaders need to know?



Effective instructional leaders must be able to:

- articulate their vision for the teaching of maths
- foster a positive culture about mathematics
- differentiate between high quality and low quality instruction
- prioritise professional learning that builds the capacity of teachers
- develop a whole school instructional approach, linked to the school vision

Context: FISO (Framework for Improving Student Outcomes)



- FISO Definition: A school's **vision** articulates to the whole school community its **values** and desired future achievements. It aims to gain support for the school's core educational **values**, goals and improvement plan. Schools routinely communicate their **vision**, **values** and culture to students, staff and parents.

The core message is that ‘good leadership is about just two things: vision and trust’ (Browning, 2014, p.5).

Big picture thinking



What is the **vision, values and culture** that drives the teaching of mathematics at your school?

What are your beliefs about teaching mathematics that influence that vision?

Small group discussion

- To lead improvement, innovation and change, schools require strong student-centred leaders who can work with teachers and the community to create a collective vision.
- The research suggests that “the development of a collective vision gains widespread support and motivates staff to engage in purposeful work towards goals” (ACARA, 2014, p.14) that will directly improve student success, connection, wellbeing and engagement. If staff are empowered to contribute, then there is more focus on the needs of the students.

-
- Starting with a challenge can build a sense of success
 - The type of task is important
 - High level thinking enhances learning
 - Cognitive activation builds positive motivation
 - Challenge needs to be appropriate and productive
 - Challenge is beneficial for all students
 - Learning is data driven

Agree or disagree?



It is the collective responsibility of all teachers to ensure that every child learns mathematics to a high level.

The more focused you are on measurable outcomes, the more narrow your teaching becomes.

Measurable outcomes may be the least significant results of learning.

~ Alfie Kohn

Investigating how to support Principals as Instructional Leaders of Mathematics



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Research by: Boston et al. 2017

Anyone leading mathematics, (not just those in the Principal class)

... need sufficient knowledge of what constitutes high quality instruction, specifically in mathematics, to be effective instructional leaders ... particularly when observing classroom practice, designing support to implement a high quality curriculum and providing beneficial feedback to teachers.

*Our VISION and our approach to HIGH QUALITY INSTRUCTION
are the key factors in designing a successful whole school
mathematics program.*

*We must be able to capture both layers so everyone at our
school is on the same page and embracing the same vision.*

- The challenge for teachers and schools is to develop a shared understanding of what excellent practice looks like.
- While we don't expect (nor want) it to look exactly the same in every classroom ... we know that one of the biggest hurdles for improving student learning is the differences in the quality of instruction from classroom to classroom ***within*** schools is greater than differences in instructional quality ***between*** schools.

What do we mean by 'high quality instruction' in mathematics?



- How do we describe 'high quality instruction' in the mathematics classroom?

Use
<https://answergarden.ch/956082>
to collect ideas

- What factors impact on the effectiveness of instruction?

Accountability and reliability



- What are the guaranteed practices and actions/ non-negotiables that support your school's vision?
- How are teachers accountable for ensuring the enactment of those?

Small group discussion



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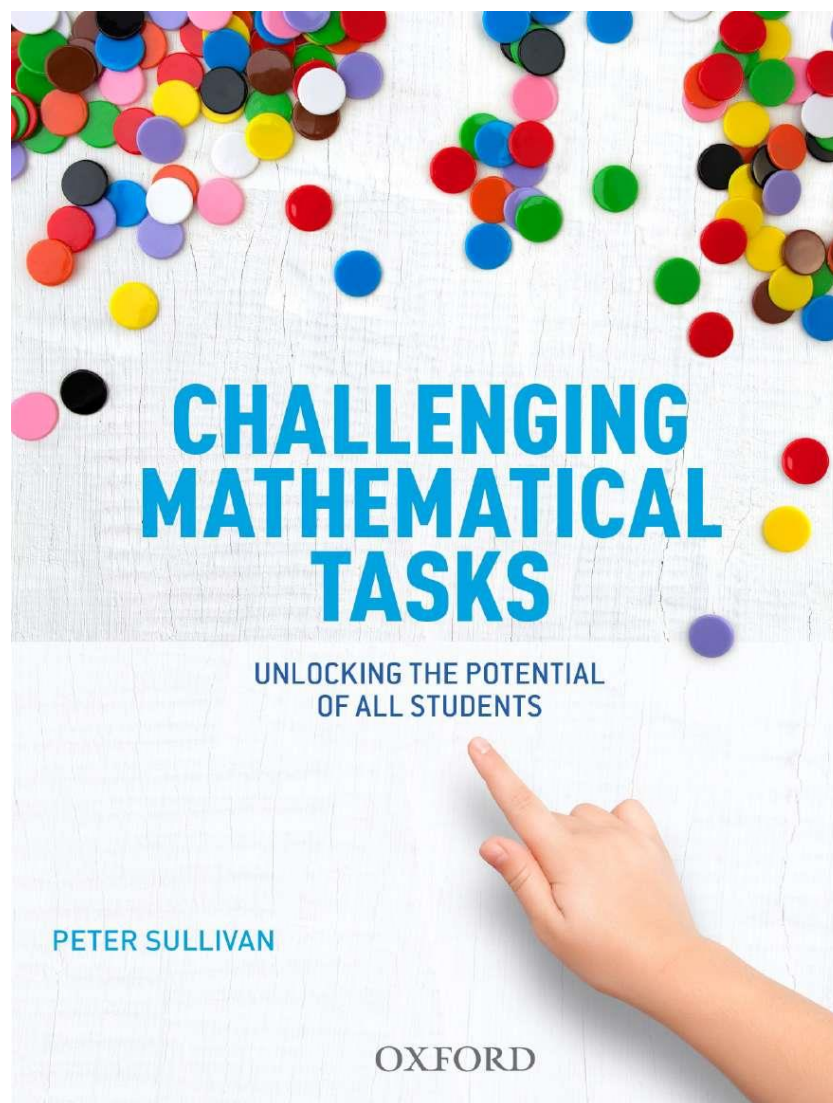


ABOUT ASCD



Turning Teaching Upside Down

- *Cathy L. Seeley*
- **Students learn more when we let them wrestle with a math problem before we teach them how to solve it.**



Does this argument make sense?



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[reSolve PL Module 4 Contrasting Approaches video](#)

Consider this task ...

Find the sum of these 20 numbers below.

$$321 + 322 + 323 + 324 + 325 +$$

$$321 + 322 + 323 + 324 + 325 +$$

$$321 + 322 + 323 + 324 + 325 +$$

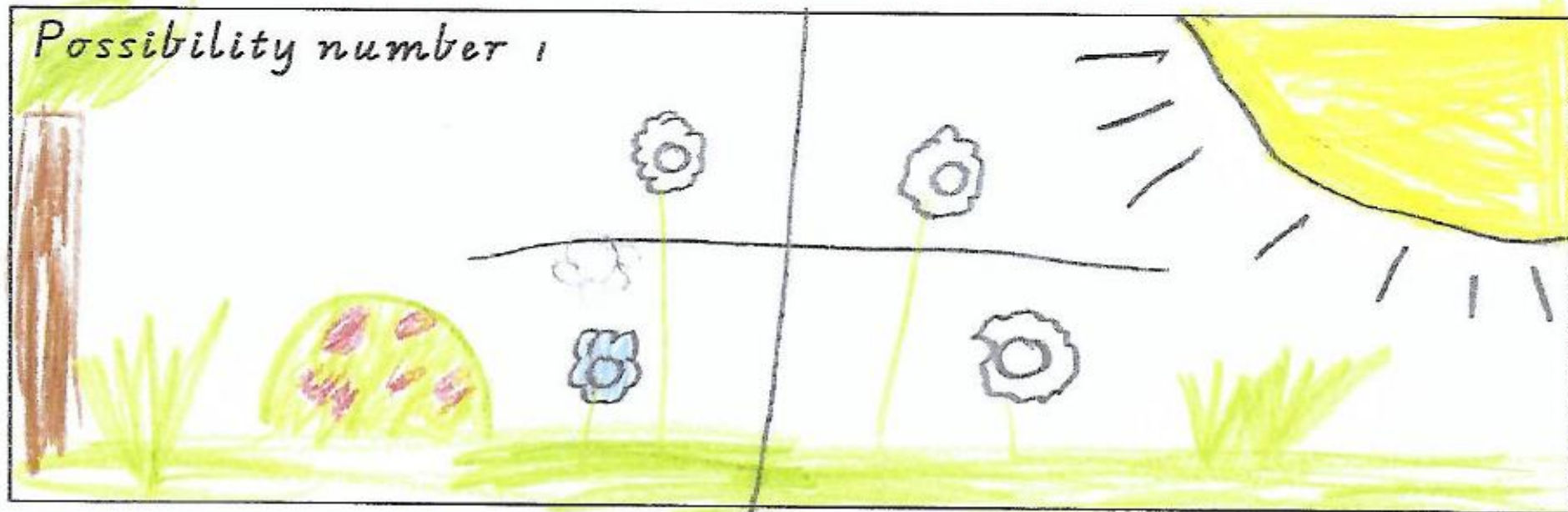
$$321 + 322 + 323 + 324 + 325$$

Consider this task ...

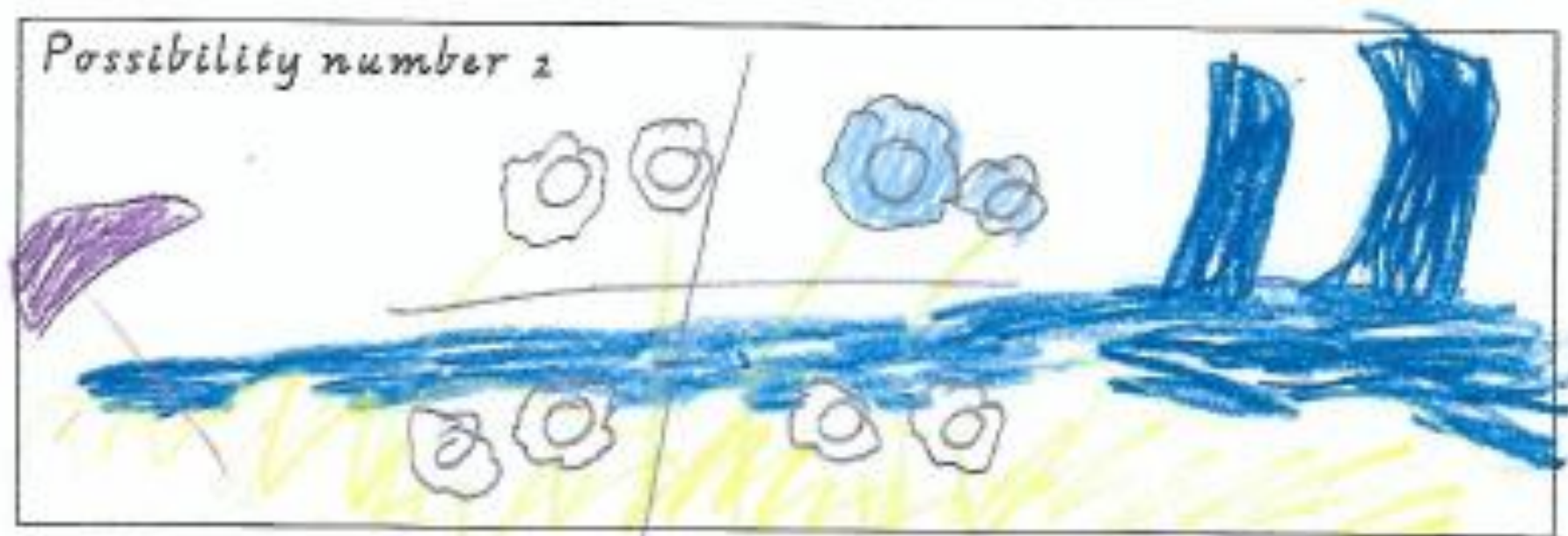
Name: *Claudia*

Fractions Challenging Task – November 2016

*A quarter of the flowers in the garden are blue.
What might the garden look like?*

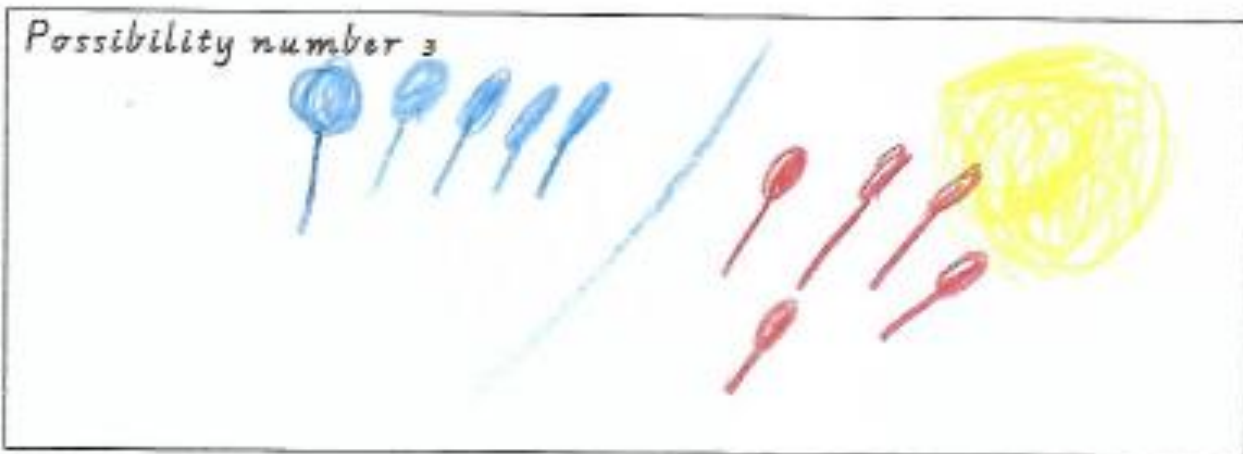
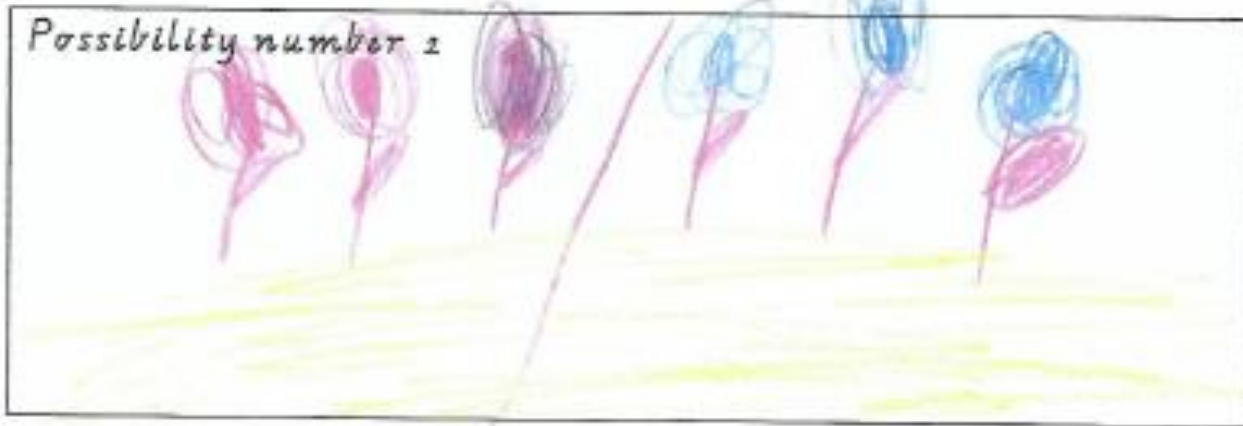


Possibility number 2



Possibility number 3





Choosing tasks for learning

We are after tasks which:

- *expose students thinking*
- *promote understanding*
- *support problem solving*
- *enable success for all students by differentiation*
- *articulate important mathematical ideas*
- *strengthen the connections to other mathematical ideas and strategies*
- *thin an over crowded curriculum*

“If we want to get all of our teachers to be the best, they have to know what the best looks like.”

Principal Dandenong North PS
Kevin MacKay

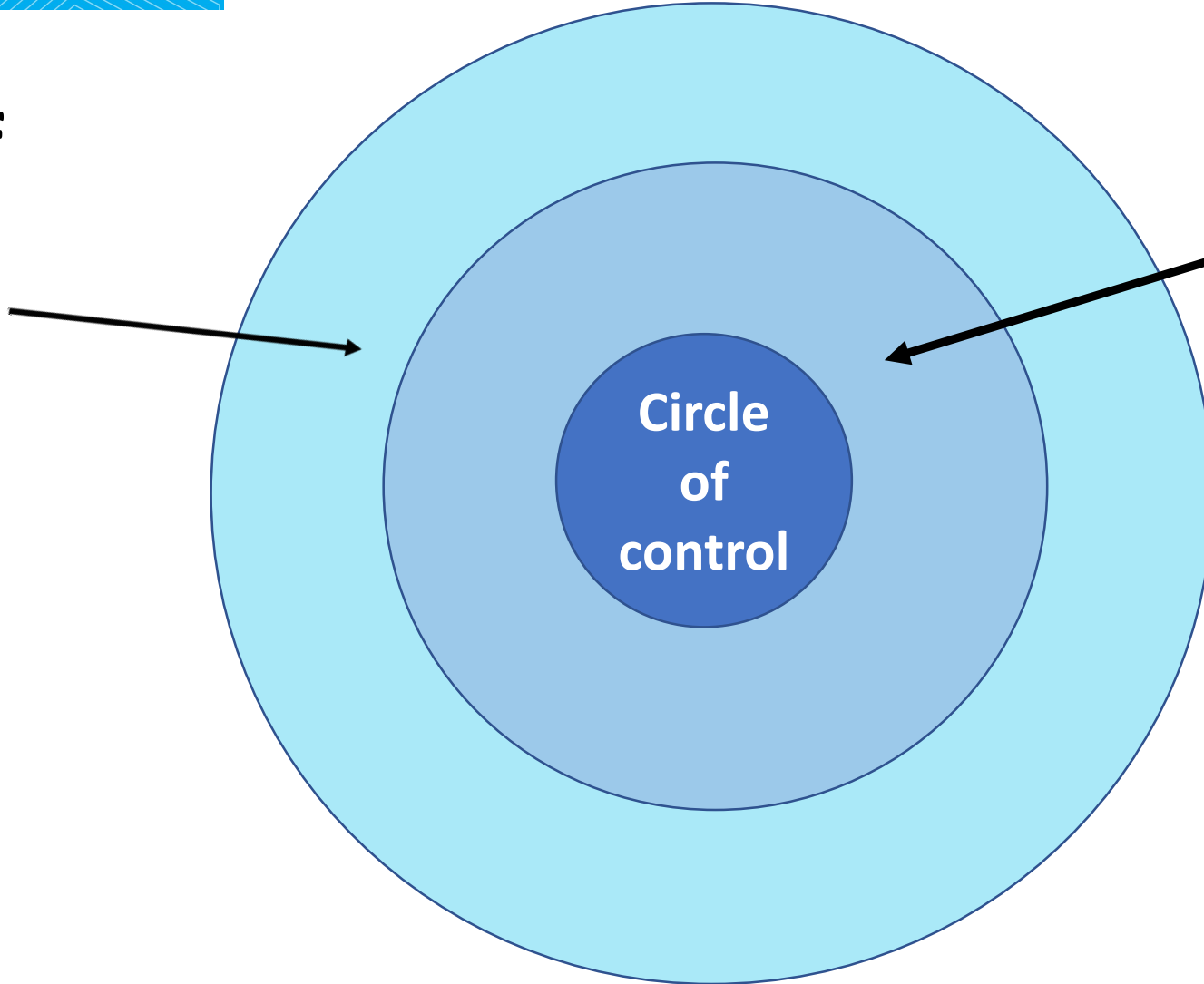
Solution focussed discussions

- *What do WE want?*
 - *How can I help?*
- *Who else has influence?*
- *Who can collaborate on that?*
 - *What else could we try?*
- *Has someone dealt with this in the past?*
 - *What have we learned?*

Where can you have impact?

**Circle of
concern**

**Circle of
influence**



Contact details

Nadia Walker

Assistant Principal

Aspendale Gardens PS

walker.nadia.g@edumail.vic.gov.au



Aspendale Gardens
Primary School