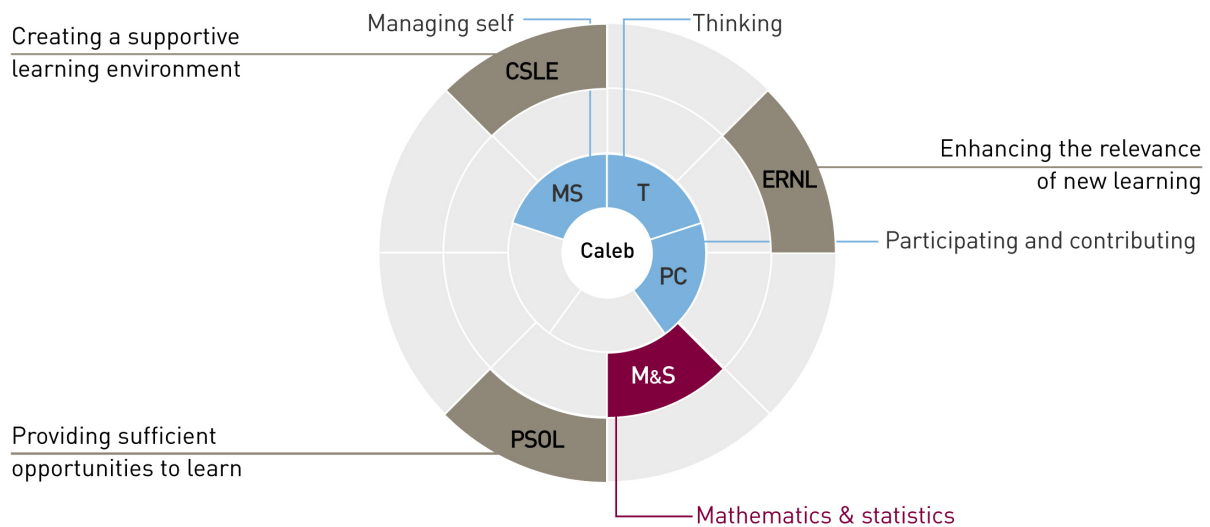


Caleb uses numbers

Links to the curriculum



Student background

Name	Caleb
Age	8
Year	3
School	Primary

Caleb lives at home with his mother, father, sister, and a dog that he adores. He loves cars, trucks, and Perceptual Motor Programme (PMP) time at school. Caleb wants to drive buses when he is an adult.

Caleb is in a class of 28 children in a large primary school. The school receives 0.1 FTE teacher support from ongoing and reviewable resourcing schemes (ORRS) funding and 12 hours of teacher aide time.

Caleb can learn things by rote after continued exposure but struggles to have the understanding to adapt the knowledge. Caleb is a verbal student.

Four learning stories

- 1. Non-sequential numbers to 10** 1 April 2008
- 2. Enjoying mathematics** 9 April 2008
- 3. I love eggs!** 5 June 2008
- 4. Shopping day** 26 June 2008

This string of learning stories shows Caleb is gaining more understanding and confidence with numbers (thinking). He is learning to relate numbers to everyday life, such as shopping for items (participating and contributing). Sequencing numbers and pictures has been a very difficult concept for Caleb, but fortunately, he has a great attitude and continues to persevere with increasing success.

Non sequential numbers to 10

Student	Caleb	Date	1 April 2008
Topic	Mathematics	Observer	Jenny (ORRS teacher)

One of Caleb's individual education programme (IEP) goals is to order non-sequential numbers up to 10. Sequencing has been a very difficult concept for him. Today, we discussed again which number was the bigger number using counters. He initially struggled but then started to get them correct. After he got it correct four times in a row, I made it tricky by only using numerals – not sets. Caleb blew me away by getting six right. Caleb was very proud of himself and went back to class with his head held high.



Way to go!

Analysis – what learning is happening here?

Individual education programme goal

One of Caleb's goals is to order non-sequential numbers up to 10. This was the first time he has achieved it with two numbers and it was a wonderful moment for us both.

Key competencies

Managing self

Caleb has struggled with mathematics for the past three years but is always prepared to try again each day. His determination won through.

Thinking

Caleb was able to make the connection between sets of counters and numerals.

Learning areas

Level 1 mathematics and statistics: Number and Algebra: number knowledge

Stage 1 to 3 – say read and write forwards and backwards counting sequences up to 10.

Where to next?

Celebrate and consolidate

We will continue to recap this lesson for another week and then move onto the same activity with three non-sequential numbers up to 10. I would like to incorporate money, as this will be relevant in his future.

Enjoying mathematics

Student	Caleb	Date	9 April 2008
Topic	Mathematics	Observer	Jenny (ORRS teacher)

After the wonderful session last week, where Caleb seemed to grasp the idea of recognising the bigger number out of two non-sequential numbers up to 10, I decided to consolidate and extend if possible. I wrote the numbers on the board – no sets this time and he once again chose the correct number five times in a row. He wanted me to draw the dots (representing counters) down under the numbers once he had given his answer. He could then see visually which set (number) was bigger and was able to check his own answer. Great to see the shift in motivation.



I decided to extend it to money. I asked him which was larger – \$3 or \$6 – written on the board. He initially looked confused by the \$ sign but then quickly grasped the idea that they were still just numbers. I was amazed to find he could get the answer correct even for some numbers up to 20.

Caleb is feeling a lot happier about mathematics.

Great work Caleb!

Analysis – what learning is happening here?

Individual education programme goal

Caleb is gaining an understanding about numbers. He was able to adapt his knowledge when the numerals were written with the dollar sign (\$). He is making good progress towards reaching his IEP goal of ordering numbers up to 10.

Key competencies

Managing self

Caleb is gaining the confidence and motivation to try new things and is developing an interest in his own progress; that is, requesting assistance to check his answers.

Thinking

Caleb was able to use his knowledge of numbers up to 10 to solve problems presented in a different way; for example, as money values.

Learning areas

Level 1 mathematics and statistics: Number and Algebra: number knowledge

Stages 1 to 3 – say read and write forwards and backwards counting sequences up to 10.

Where to next?

Increase complexity

Caleb has been trying to order three non-sequential numbers up to 10 without success. We will continue with this goal.

Caleb will "buy" items from a school shop – deciding if he has sufficient money.

I love eggs!

Student	Caleb	Date	5 June 2008
Topic	Mathematics	Observer	Jenny (ORRS teacher)

For the past two weeks Caleb and I have been practising using money (\$1 and \$2 coins). Caleb is now showing some recognition of the coins. Today, he was buying some items from the "school shop". I had brought some packets from home and put a sticker on them to show the cost of the item. First, he needed to count the money in his wallet (all \$1 coins), decide what he wanted to buy (dollar amounts up to \$10), and then decide whether or not he had sufficient money (whether his number was larger than the cost of the item). This was a real challenge. Eggs were his favourite item.

After several attempts he began to get the idea. He was thrilled when he realised he had sufficient money to buy the eggs and was even able to have some change. Initially, he kept giving me all the money, regardless of cost.



Since that day there has been no stopping him. We have acted out the scene where I am the shopkeeper and he is the customer. Every day he wants to buy different items and gradually he is becoming more confident about whether he has sufficient money to purchase the item. Next week, I would like to take him to a real shop and see how he goes.

Analysis – what learning is happening here?

Individual education programme goal

Caleb is continuing to widen his knowledge in ordering numbers to 10. He requires the information presented in many different ways before we feel the goal has been reached.

Key competencies

Thinking

Caleb is starting to figure out how to use money to buy things he likes. He needs to decide whether he has enough money to purchase a chosen item.

Participating and contributing

Caleb is becoming more interested and aware of the world around him and feels more confident about using money in a class "shop".

Using language, symbols, and texts

Caleb is showing increasing confidence with numbers up to 10 and dollar symbols.

Learning areas

Level 1 mathematics and statistics: Number and Algebra: number knowledge

Stage 1 to 3 – say read and write forwards and backwards counting sequences up to 10.

Where to next?

Celebrate and consolidate

I will organise a trip to the \$2 shop and get Caleb to choose one, two, and three items and figure out what the cost will be. He will need to decide whether he has enough money and then pay the correct amount to the shopkeeper.

We also need to continue to practise ordering three non-sequential numbers, as this continues to be difficult for Caleb.

Shopping day

Student	Caleb	Date	26 June 2008
Topic	Mathematics	Observer	Jenny (ORRS teacher)

At long last – the day Caleb was waiting for. The trip to the \$2 Shop to choose something for himself and some goodies for the treat box. The purpose was for Caleb to decide whether he had enough money to pay for the items, then pay the shopkeeper correctly – keeping any extra change, rather than passing all the money over. We took another three children as well – their task was to make sensible choices, and count to two as they handed the coins to the shopkeepers.

Once in the shop, Caleb became very excited – there were lots of things he wanted. He would choose one item, swop it, then pick up another, then swop again. Eventually, we told him he had two minutes left. He chose a pair of skeleton gloves, which he decided would be brilliant for mufti-day. It was a great choice – he was planning ahead. I added two extra items to his basket for the treat box.

Finally, it was time to buy them. Unfortunately, the shop was busy and Caleb was very excited and unable to work out the cost of three items. He had \$8 in \$1 coins. He greeted the shopkeeper shyly and said he wanted to buy three things. She told him it would cost \$6. When I questioned Caleb, he knew he had enough money (this relates to his IEP goal). He carefully counted out the coins into her hand. He was left with \$2. I was thrilled when he knew to keep the last two coins, rather than hand those over as well. He remembered from our practices at school. He left the shop with a sparkle in his eyes. We finished the trip with a short play in the nearby playground. A very successful day.

Great stuff, Caleb.

Analysis – what learning is happening here?

Individual education programme goal

Caleb will be able to order two non-sequential numbers up to 10. Caleb demonstrated that he could recognise which was the larger of two numbers, as he knew he had sufficient money to buy the items.

Key competencies

Thinking

Caleb was able to make a decision about what to purchase in the shop. His decision showed great thought and planning ahead. He was very proud to explain the reason for his choice. Caleb gave the correct amount of money – no more, no less.

Participating and contributing

Caleb showed an interest in his local environment and enjoyed being part of a shopping trip. He enjoyed being able to decide what to buy and figuring out how much to pay for it.

Learning areas

Level 1 mathematics and statistics: Number and Algebra: number knowledge

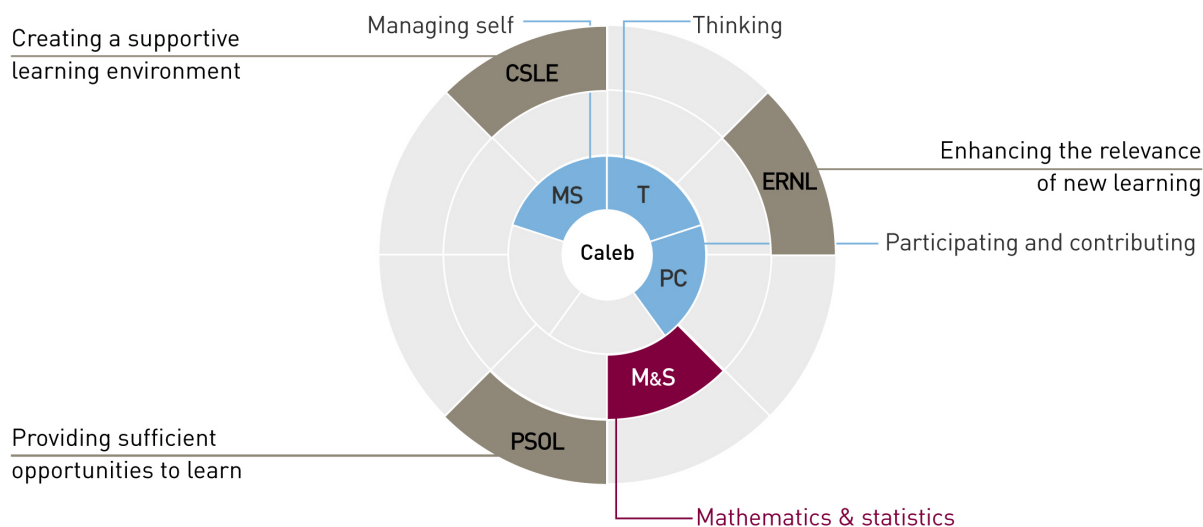
Stage 1 to 3 – say read and write forwards and backwards counting sequences up to 10.

Where to next?

Celebrate and consolidate

Caleb managed really well on the trip. However, I know he still requires more practice to consolidate what we have been learning (ordering two and three non-sequential numbers) and to be able to adapt this knowledge to everyday life; for example, money, measurement, and reading time. We will continue recapping all the stages for several more months and introduce other situations where number knowledge is essential – just to be sure.

Reflection – what these stories exemplify



Key competencies

Over the past three months, Caleb has demonstrated the key competency: thinking, as he learns that numbers have a purpose and that they are necessary in shopping. Initially, it was a huge step to identify the larger of two numbers; in the final story, he was realising how he could use that knowledge to purchase items in a shop and to decide whether he had enough money. Caleb also showed an ability to make a sensible choice when choosing an item to buy.

Caleb also showed perseverance and co-operation in his learning. He asked for his answers to be checked and asked to participate in shopping activities. He was prepared to continue working on problems he found difficult until he got them correct (managing self). Caleb enjoyed participating in authentic contexts, such as shopping, with his ORRS teacher and peers.

How might these stories strengthen Caleb's identity as a learner?

Caleb is showing greater confidence in his knowledge and use of numbers and is now asking for more occasions to practise his developing skills – buying eggs (agency). To date, most of the learning has been within the classroom but Caleb has been able to see how his knowledge could be useful elsewhere – at the shops (breadth). He has had many opportunities presented in different ways, (concrete sets, numerals, money, and a trip) to practise his IEP goal of ordering non-sequential numbers to 10 (depth).

For more information on the four dimensions of agency, breadth, continuity, and depth (ABCDs), refer to *Narrative assessment A guide for teachers*.

Learning areas

Level 1 mathematics and statistics

This learning is focused on numeracy stages 1 to 3. Caleb is learning how to say, read, and write counting sequences up to 10. He is identifying, with greater accuracy (7 out of 10 times), the larger of two numbers up to 10 and is realising the usefulness behind such knowledge (shopping). Caleb will require more consolidation before his goal is achieved, as he is still unable to order three numbers despite continued practise throughout this sequence of stories.

Effective pedagogy

What does this tell us about teaching and learning in this setting?

The teacher has created a supportive learning environment by having high expectations for Caleb. She encourages him to reflect on his learning and to celebrate his achievements. The teacher never gives up and is always seeking new ways forward with Caleb's learning.

Caleb has been given a lot of repetitive practise and a range of experiences to learn more about numbers up to 10 (providing sufficient opportunities to learn). He has enjoyed the practical application of the lessons provided by the teacher and has shown enthusiasm towards his mathematics (enhancing the relevance of new learning).

Reflective questions for the reader

"How can I present information in new ways to keep a student interested?"

"What are the practical skills around the goal the student will need as they get older?"

"How does a student show me what she or he knows and can this knowledge be shared and used with the other children in the class?"

Useful resources

Mitchell, D. (2008). *What really works in special and inclusive education: Using evidence-based teaching strategies*. London: Routledge.

Wright, R.J., Martland, J., Stafford, A.K., & Stanger, G. (2006). *Teaching number, advancing children's skills and strategies*. London: Paul Chapman.