Unit of Work
Reception Class
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Why use Stories?

To engage learners and inspire mathematical exploration I designed a unit of work using familiar stories by Eric Carle. This contextualised learning would enable me to plan a program that built on the "different abilities of students and their prior learning experiences" (ACARA-Diversity of Learners).

In cognitive thinking - I was challenging my thinking and learning to program a unit of learning embracing all curriculum areas with an emphasis on our School Development Plan focal points *Engagement* and *Comprehension*.

The students and I needed to be receptive and open to new learning: we needed to develop understanding of 'engagement language'. It was important to have something that was creative, something the would 'hook them' into the learning. After lots of ideas were discussed we decided on a '*Magic Engagement Tree'* (Magical Tree). Student learning engagement is recorded on leaves and put on our tree.

I needed to instigate adult learning for me that focused on developing my understandings of how to effectively use ACARA and SA TfEL Framework in my planning for student learning.

As an adult learner I had to step outside 'my comfort zone' and 'take a risk'! I attended workshops, read the documents, clarified my understandings with colleagues, and Advisers (Chris Ratcliff). This built belief in my ability to 'have-a-go' at designing a planning tool. (It needs to be simplified, but if you don't 'take a risk' and 'have-a-go' you don't learn!)

'Aligning what and how of teaching and learning in the Australian Curriculum' is a framework that helped me design my learning: this is all the pre-thinking before I need to do my learning activities.

Assessment is essential in the teaching and learning process as it enables me to make judgements about the evidence I've collected. In this process I am reviewing and questioning my own practice.

Our Magic Engagement Tree

Examples of leaves on our Magic Engagement Tree

Krush showed how to count the caterpillar legs in a different way – by two's. He said it's quicker!

Jimmy worked out a problem he had with constructing his ladybird in a respectful way. Well done!

Jesse creatively worked out different ways to show 4 feet

Julie had her best try at arranging five oranges in different ways. She asked for help when she needed it.

The whole class was motived and stayed on task when doing the Very Hungry Caterpillar ten frame activity

Haylee represented the berries on her ten frame by counting them and telling her partner - she counted to 23.

Krush knew straight away how many dots were on the 2 die in the 'Stop eating my...' ten hoop (frame) game. He verbalised "4 and 5 is 9".

Kaitlyn worked cooperatively with her partner when playing the Hungry caterpillar berries ten frame game.

Jimmy consistently celebrates what he does well and wants to share with the class when he comes up with a good idea.

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What is the intended outcome?
Why is it important?
TfEL: Domain 1.2

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ACARA / SACSA Curriculums: Theme–Developing learning across curriculum areas using stories written by Author/Illustrator Eric Carle.
(Mixed Up Chameleon, Very Hungry Caterpillar, Bad Tempered Ladybird)

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Focus: School Development Plan Foci **Comprehension & Engagement** with an emphasis on **Mathematical Learning.**

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Year Level Description:
ACARA – Foundation Year:
• English
• Mathematics
• Science
• History

SACSA – Reception
• Health & Physical Education
• Society & Environment
• Design &Technology
• Arts

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Content Description:
Numeracy:
Learning to develop the proficiency strands understanding, problem solving and reasoning across Number and Algebra, Measurement and Geometry, Statistics and Probability. Reinforcing working mathematically to describe how the content is explored or developed.
Literacy:
Learning to build on concepts to develop students' knowledge, understanding and skills in listening, reading, viewing, speaking, writing, creating.

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Engagement Strategies:
• Having a sense of purpose and understanding of what they are doing.
• Enabling different entry points to tasks to retain confidence and success as learners.
• Challenging thinking and learning at these entry points to motivate and maintain interest.
• Encouraging students' to have their best try and try again if it doesn't work – persistence.
• Allow opportunities for students' to be involved in decisions and making choices about their learning. Being flexible and renegotiating if something doesn't work.
• An emphasis on active open ended problem solving with different entry points and expected outcome achievement.
• Promoting wellbeing as central to learning–sustaining cooperative, respectful, fair partner/ group / whole class interactions.
• Opportunities to experiment, explore and discover new learning or ways of working–SHARING what they have found out.
• Having FUN and enjoying learning through play–engagement in task.

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Comprehension Strategies:
• Understands concepts of print/ digital texts (letters, words, directionality).
• Motivating learners by presenting the stories knowing that texts can take different forms (Big Book, Video).
• Giving opportunities for learners to express and develop ideas (respond) in a meaningful, familiar context about the stories (new vocabulary or information introduced).
• Developing/consolidating features of texts (sentences, rhyming, characters, events).
• Recognising authors tell stories that may be similar or different to students' own experiences (relevancy, why–feelings, thoughts, favourite parts).
• Develop familiarity with the stories – repetitively reading stories to empower students' to read independently and retain enjoyment/interest in the stories (manipulating/sequencing laminated pictures, interactive smartboard activities).
• Imaginative retelling of the stories (puppet plays, partner games)

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General Capabilities:
Numeracy:
• Think flexibly about numbers.
• To know the purpose of shape in the context of their life experiences.
• Recognising and understanding the role of mathematics in their world.
Literacy:
• Developing a deep appreciation of literature.
• Communicating effectively for different purposes in a range of contexts.
ICT:
• Confidently uses technology as a tool for learning.
Creative and Critical Thinking:
• Explore identified questions and clarify using critical reasoning processes and creative thinking.
• Use relevant information from a previous experience to inform a new experience.

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Achievement Standards:
Numeracy: Connecting number names, numerals, quantities to 10 (subitising). Connecting events and week days. Explains order and duration of events. Uses mathematical language. Sorts shapes, objects using common characteristics. Answers simple questions to collect information.

Literacy: Uses prediction and questioning to make meaning of Eric Carle texts. Identifies connections between texts and personal experiences. Identifies, describes characters and events in the texts. Retells events with peers and known adults. Identifies rhyme. Uses familiar words and images from the text to convey ideas.

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Big Ideas / Deep Understandings:
• Using Author Eric Carle stories to engage learners in Mathematical thinking and learning across all curriculum areas.
• Implementing strategies (games, videos, partner/group/whole class activities, manipulative resources) that challenge and maintain purposeful learning.
• General Capabilities: Using play based learning to promote wellbeing – cooperation, respect, being fair.

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	Content Descriptions Beginning Stages	Content Descriptions At Year Level	Content Descriptions Extension	Engagement Possibilities / Strategies
What could the intended learning look like at this level? (TfEI: Domain 4.2, 4.4)	Scaffold *Counting to10.* Connect number names, numerals and quantities to 5. *Subitise to 5.* *Sorting collections.* *Ordering a simple sequence of events.* *Developing awareness of time language –days/clocks.* Sort and name/make patterns with familiar shapes.	*Number and Algebra* *Counting–20* (ACMNA001) Connect number names, numerals and quantities to 10. (ACMNA002) Subitise (ACMNA003) Practical addition/sharing. (ACMNA004) *Measurement and Geometry* *Order events / use time language* (ACMMG007) *Connect familiar events to week days* (ACMMG008) *Describe / name familiar 2D/3D shapes* (ACMMG009) *Statistics and Probability* Answer questions to collect information (ACMSP011)	Proficiently *Counting to and from 20, moving from any starting point.* Connect number names, numerals and quantities beyond 10. *Subitise with 2 die–How many? How do you know?* *Recording addition and sharing collections (fair/ unfair).* *Independently ordering familiar events and days of the week.* *Using time in context e.g. 10 o'clock brain food time.* *Compares collected information.*	*Students involved in making learning choices.* *Learning in familiar contexts, with a sense of purpose.* *Open ended tasks that involve working with others.* *Use technology skills to help my learning–using cameras, ipads, computers.* *Supporting students to build on their strengths as learners* *Hook them in–make learning relevant.* *Hands on mathematical explorations.* *Using familiar texts to unlock magical mathematical learning.* *Provide a safe environment to 'have-a-go'.* *Provide opportunities for reflection and sharing of WOW moments.*
	Achievement Standards			
	At Foundation year students listen to and use appropriate language features to respond to others in a mathematical context. They use predicting and questioning strategies to make mathematical meaning from texts. Students make connections between number names, numerals and quantities up to 10. They connect events and the days of the week and explain the order. They use appropriate mathematical language in context. Students count to and from 10 and order small collections. They group objects based on common characteristics and sort shapes and objects. Students answer simple questions to collect information. Students share observations of living things (insects).			

What Evidence will enable us to assess the intended learning? TfEL: Domain 4:3				
Self Assessment/Reflection • How they felt about the Ladybird Friends/Home • what they knew about clocks • which activity did they like doing best / least and why?	**Peer Assessment**	**Observation/Anecdotal Notes** • testing the sand timers • how many butterflies, eggs, caterpillars can you draw in 30 seconds? (Involvement/Learning) •. orange counters – involvement / skills • pre/post circle knowledge • graph of food eaten • what they know about clocks	**Rubrics** • engagement rubric
Checklist • pre/post what do you know about a circle? • counting the food the caterpillar ate • subitising ladybird spots • subitising to 6	**Conferencing/Questioning** • brainstorming what we know about a circle/cube • how can we turn a sphere (orange) into a circle?	**Work Samples** • orange arrangements using Tuxpaint • Hungry Caterpillar sequencing • what we can do in 30 seconds • Tuxpaint lifecycle drawing • recording how many orange counters – 1 number / adding • class work - chameleon graph • orange counter arrangements • drawing 10 foods to eat • feet on name caterpillars	**Summative Assessment**
Photographs • making a cube and 3D Ladybird object • playing toss the Ladybird game • changing a sphere to a circle and our artwork • letters in names human graph • chameleon game • sequencing Hungry Caterpillar story • human graph • testing the 30 second timers • celebrating	**Videos** • sequencing The Hungry Caterpillar story • three entry points to a caterpillar eating game	**Models/Artwork** • geo shape cube • 3D object-ladybird friends • designing a cube home • printed circle artwork of a caterpillar • drawing a clock	**Partner/Group Work** • playing Hungry Caterpillar "what happens" in the story game toss the ladybird game-tell your partner how many spots. • brainstorm – circle / cube • what they know about time and clocks

Sharing Learning (final product)	...Assembly ... at Staff Meeting	...to Parents ... At the Numeracy & Literacy Expo	...First Year Students

Learning activities

The Very Hungry Caterpillar	Cross Curriculum Links:
Mathematics: • Tux paint …Arranging oranges for the caterpillar to eat through …drawing a butterfly lifecycle/ordinals 1st, 2nd, 3rd • Three entry points …Caterpillar partner game / subitising …Feet on name caterpillars-recording 3 ways …Subitising hoop ten frame game-5 hoops 1-5 (oranges), 10 hoops 1st-10th and 1-10 (10 different foods) • Graphing-how many letters in your caterpillar name? • Shape …Brainstorming what we know about a cube, circle …Using circles (hoops) to play a ten frame game …Creating a 3D object-three ladybird friends and a cube house for them to live in …Changing a sphere (orange) into a circle to print a caterpillar • Partner game arranging orange counters-roll a dice and represent the oranges in 1/2 rows • Sequencing …Sequencing puppets …Pasting a sequence of the story and changing into a piece of clothing, then using a flip camera to video each other • Time …Days in a week-match pictures to the day …Test 30 second sand timers against a time lapse lifecycle …Time how long it takes for the story (should be 6 minutes) • Draw 10 foods to eat on Saturday • Sort foods into food groups-compare	English: …Dramatising the story …Sequencing as a class with puppets, each retelling their part of the story …Brainstorm adjectives to describe the characters …Writing a simple descriptive sentence using the adjectives …Brainstorming words about how each character is feeling in different parts of the story …Partner verbalising the story caterpillar game Health: …An investigation using a food pyramid–which groups do the foods belong in? …Sorting the food the caterpillar ate into food groups Physical Education: …Activities using hoops (the shape of the caterpillar body segments) Arts: …Printing a caterpillar using an orange to create the circle shape Design & Technology: …Making a butterfly with wings that flutter …using ICT to arrange oranges in different ways and drawing tools to draw a butterfly lifecycle Science: …Lifecycle of a butterfly …How do I know a butterfly is an insect?

Aligning *what* and *how* of teaching and learning in the Australian Curriculum

What is the intended learning and why is it important?

Students are:
• developing capability in using ICT as they learn to generate ideas and possibilities of how to arrange the oranges.
• learning how to experiment and problem solve their ideas.
• developing strategies of how to count, represent and record practical situations.

What do we want them to learn?

What do they bring?

Prior knowledge of counting strategies.
Real life experiences of comparing i.e. 'you have more smarties than me!'
Real life experiences using technology at home i.e. iphones, family computer. (This exposure may only be through games – this is still bringing understanding).

What could the intended learning look like at this level?

Reception
ACM
Understand the language and process of counting   (ACMNA001)
Connect number names, numerals and quantities, initially up to 10 (ACMNA002)
Represent practical situations to model addition   (ACMNA004)
Subitising using dice. (ACMNA003)

How will we know if they got it?

What evidence will enable us to assess the intended learning?

• Photographs
• Technology -computing
• Anecdotal notes
• Conference - questioning
• Feedback to scaffold students
• Self-reflection

How will we engage, challenge and support their learning?

Engage: Using ICT to create different ways to arrange the five oranges.
Challenge:
• using technology
• working collaboratively
Support:
• Model arranging oranges using the TUXpaint computer program.
• Scaffold logging on/off the computer and which tools to use.

So what will we do to get there?

Design the teaching and learning plan

Create different ways the five oranges could be arranged using ICT (Computers-Tuxpaint).
Working collaboratively with a partner to show different ways of arranging orange counters- verbalise your solution. Use a dice to determine how many orange counters to use.
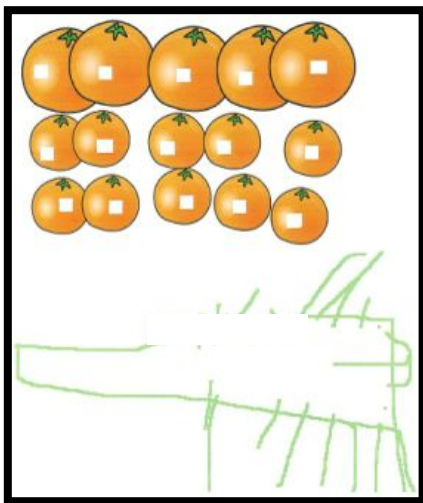Represent ways to arrange up to 6 orange counters - record.

On Friday the Caterpillar ate 5 oranges

Task: Arrange the 5 oranges in as many different ways as you can, so the caterpillar can eat through them.
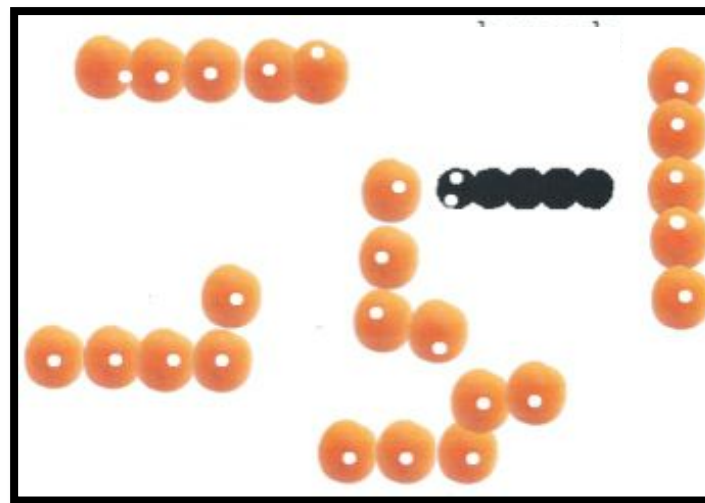

Student Reflection:
"I can't do it".

Teacher Reflection:
Attitude: Malcolm needed scaffolding in his learning to attempt the task. We worked together to create a different way, but he couldn't process the concept and reverted to putting the oranges in a line.
Consolidation: Manipulate counters or flip blocks to show a different way of representing a number. (He tried this the next day and with scaffolding could show another way).

Skills: Knew how to count to 5.

Student Reflection:
"I just know!".

Teacher Reflection:
Attitude: Kane's' involvement in the task was self-directed. He explored and shared new learning with his peers-how to make the hole the caterpillar made.

Skills: He represented the 5 oranges four different ways-the bottom middle one was complex (going 3 directions). One group only had 4 oranges. He told me he had represented them in 'straight lines'.

Hungry Caterpillar What different ways could the oranges be arranged for eating through?	**Involvement in task:** Highly motivated, explored ways to arrange the oranges. Proud to show his learning. Innovated on eating holes by using circles. **Mathematical Learning:** ..created 5 ways to eat through the oranges. .. confidently represented counting strategies.	**Involvement in task:** Mostly engaged in activity with moments of intense concentration. Sought help and was encouraged to challenge herself and work out different ways to arrange the oranges. **Mathematical Learning:** ..showed 4 ways to eat through the oranges. ..represents counting strategies	**Involvement in task:** More or less maintained activity. Limited motivation, routine actions, superficial attention. Did not use capabilities to full extent. **Mathematical Learning:** ..showed 4 ways to eat the oranges. ..represents counting strategies
Involvement in task: Highly motivated and showed delight in exploring ways to arrange the oranges. Shared her learning to enable others' to successfully attempt the task. **Mathematical Learning:** ..created 5 ways to eat through the oranges. .. confidently represented counting strategies.	**Absent**	**Involvement in task:** Frequently interrupted activity often dreaming and did not use his capabilities to full extent. Needed encouragement to refocus and have-a-go. **Mathematical Learning:** ..showed some ways to eat the oranges. ..represents counting strategies	**Involvement in task:** Motivated, successfully completes task, took initiative with new learning. Confidently shared how to make square eating holes. **Mathematical Learning:** ..created 5 ways to eat through the oranges. .. confidently represented counting strategies.
Absent	**Involvement in task:** Limited concentration or interest in activity and easily distracted. Gives up easily if unsuccessful and doesn't ask for help. **Mathematical Learning:** ..able to count to 5, but didn't represent any ways to show the oranges for eating through. Kept on erasing her efforts.	**Involvement in task:** Limited concentration or easily distracted. He asked for help, but kept on digressing from task. **Mathematical Learning:** ..able to count to 5, but didn't represent any ways without step by step intervention. Even then 5 oranges was not consistently represented.	**Involvement in task:** Easily distracted and kept erasing orange arrangements. More or less maintained activity. **Mathematical Learning:** ..made a few ways to eat through the oranges. ..represented 5 oranges
Involvement in task: She had difficulty with fine motor control when trying to arrange oranges close together. She persisted, completing the task with a sense of success. **Mathematical Learning:** ..showed 3 ways of grouping the oranges for eating through. .. able to count to 5, but groups inconsistently represented	**Involvement in task:** Often became distressed and needed adult support to let him know he was doing the right thing. He was determined to complete the task, persisting to overcome the challenges. He was smiling and happy when he showed me what he had done. **Mathematical Learning:** ..represented 5 oranges in a straight line three times.	**Involvement in task:** She maintained intense activity and confidently explored ways to arrange the oranges. She challenged others' sitting near her by 'teaching' them how to do it. **Mathematical Learning:** ..created 7 ways to eat through the oranges. ..confidently represented counting strategies.	**Involvement in task:** Resilient throughout activity, attempting successfully after being shown by others' and encouraged to have-a-go. She showed willingness to persist. **Mathematical Learning:** ..arranged 2 ways to eat through the oranges. ..kept recounting to make sure she had 5 oranges.
Involvement in task: Sought help to commence task and then maintained activity focus, concentrating on working out ways to arrange the oranges **Mathematical Learning:** ..arranged 3 ways to eat through the oranges ..able to count to 5, but some groups had too many oranges	**Absent**	**Task:** Use Tuxpaint to create a caterpillar using spots. **Involvement in task:** He asked for help to log on. Initially he painted colours on the page and then commenced task maintaining focus.	

On Friday the Caterpillar ate 5 oranges

Task: Use counters to arrange the 4, 5 or 6 oranges in as many different ways as you can – record your ways. Were the oranges shared fairly or unfairly?
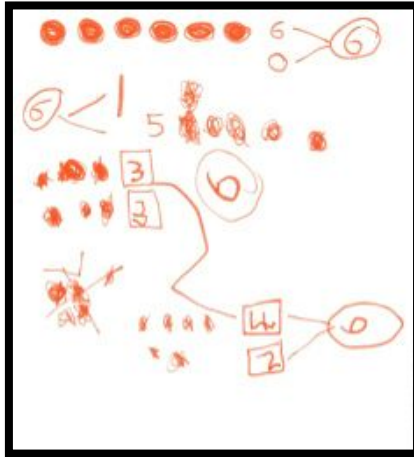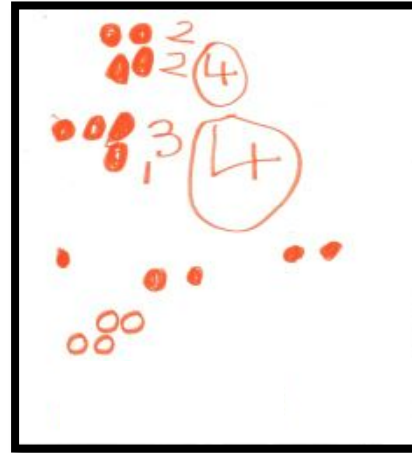

Student Reflection:
He reacted excitedly when he was told 'good job'.

Teacher Reflection:
Attitude: The task was adjusted to engage Alex. He likes manipulative activities and working with numbers.

Skills: With questioning to direct his thinking process Alex worked out different ways to show 6. His entry point to the learning was flexible and didn't encompass the being fair process.
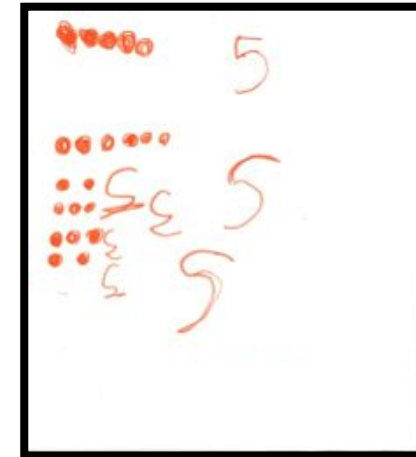
Student Reflection:
Not confident – kept looking at me for reassurance. She had a big smile when she worked out the second way!

Teacher Reflection:
Attitude: I scaffolded 2 ways with her. Denise manipulated the counters to make a way of her own. Throughout the process she kept looking at me to confirm that what she did was right.

Skills: She is able to count/record how many in each row and altogether. Not sure about fairness-knew 3 was more.

Student Reflection:
"It's hard to write the numbers".

Teacher Reflection:
Attitude: Naomi needs encouragement to face challenge, but has a sense of achievement when successful.

Skills: She 'had-a-go' and worked out ways that were the same –'turnarounds'. Capably counted how many in each row and altogether, but needs to consolidate number formation. She knew her ways were "not fair".

Aligning *what* and *how* of teaching and learning in the Australian Curriculum

What is the intended learning and why is it important?

Students:
• will be able to make mathematical connections with familiar shapes they see or use (a hoop is a circle, an orange is a sphere).
• are linking their learning to other curriculum areas Arts.
• are developing understanding that Mathematics is inherent in all experiences.

What do we want them to learn?

What do they bring?

A circle hunt in the classroom - brainstorm what they know about a circle.
Real life experiences where oranges were cut in half for sharing with siblings - they may not have made the connection when the orange was cut in the middle and opened out that you could see 2 circles.

What could the intended learning look like at this level?

Reception
ACM
Shape-sort, describe familiar 2D / 3D shapes.
Contextualised learning inquiry to create 2D / 3D shapes/objects (ACMMG009)

How will we know if they got it?

What evidence will enable us to assess the intended learning?

• Photographs
• Anecdotal notes
• Conference – questioning, discussions
• Pre/post assessment
• Artwork
• Feedback to students to support / consolidate/ celebrate learning
• Brainstorm of what we know about a circle

How will we engage, challenge and support their learning?

Engage: Students are challenged by changing an orange (sphere) into something to print with (a circle)- gains interest.
Challenge: Manipulating the slippery orange in the printing process
Support:
• Embed the language of shape.
• Model how to print the caterpillar.
• Scaffold construction of designs
• Explicitly introduce a sphere.

So what will we do to get there?

Design the teaching and learning plan

Consolidate circle properties.
Investigate how to change a sphere (orange) into a circle for printing.
Design a print art work "caterpillar".

FUN, but MESSY

How can we change an orange (sphere) into a circle for printing?

"Cut it in half".
(Naomi)

"Help Julie it's slipping". (Kathryn)

Showing our caterpillar artwork at assembly.
We shared how we changed an orange (sphere) so that
we could print circular caterpillar body parts.

Very Hungry Caterpillar CIRCLE		Prior knowledge about circles	Post knowledge after unit of work about circles
	Term 2 2011	..round ..1 side ..thought it was an oval	..it's round ..a circle ..it's curved ..has 1 side
	Term 1 2012	..it's round	..a circle ..a round shape ..it's shut ..a flat shape
	Term 1 2012	..a circle ..it's round	..a circle ..it's flat ..it's round
	Term 1 2012	.. round shape ..a circle	..a circle ..it's closed ...a flat shape
	Term 1 2012	..absent	..a circle ..it's round ..it's flat ..it's curved ..it's skinny
	Term 1 2012	..it's round ..a circle	..it's curved ..it's round ..it's shut
	Term 1 2012	..a circle ..it's round	..a circle ..a flat shape ..a curved side .
	Term 1 2012	..a round shape	absent
	Term 1 2012	..a circle	..a circle ..it's round ..it's like a wheel
	Term 1 2012	..a circle ..like a wheel	..a circle ..it's round ..it's a train wheel
	Term 2 2012	..round side ..a circle	..a circle ..it's curved ..it's round ..it's skinny
	Term 2 2012	..a circle ..it's round	..a circle ..it's round ..it's shut
	Term 2 2012	..a circle ..like a tyre ..thinks the outside edge is a straight line	..it's curved ..it's a circle ..it's closed ..a circle ..
	Term 2 2012	..thought it was an oval ..looks like an alien ship at the bottom	absent
	Term3 2012	..a circle	..a circle .. it's curved
	Term3 2012	..a circle ..the shape is round	..a circle ..it's flat ..it's round ..it's closed
	Term3 2012	..absent	..a circle ..it's side is like a curve ..a thin shape
	Term3 2012	..	..circle

Aligning *what* and *how* of teaching and learning in the Australian Curriculum

What is the intended learning and why is it important?

Students will:
• consolidate and practise how to develop social capability and work cooperatively together.
• bring what they already know when subitising collections (how many in 1 or 2 groups.) They are using this skill when playing family / school games with dice.
• reflect on their own learning when they look at the flip movie.

What do we want them to learn?

What do they bring?

• Observe how they work as a class playing the Chameleon board game – this will show who uses collaborative skills and knows the strategies for counting on, moving your counter from the right starting point and subitising the dots on a dice.
• Give opportunities for students who use 'good practice' when playing the class game to teach others.

What could the intended learning look like at this level?

Reception
ACM
 Understanding of the language and processes of counting by naming numbers in sequences.
 (ACMNA001)
Subitising small collections.
(ACMNA003)

How will we know if they got it?

What evidence will enable us to assess the intended learning?

• Photographs
• Observations – partner work
• Flip camera movie clip
• Feedback to students to support / consolidate/ celebrate learning

How will we engage, challenge and support their learning?

Engage: Having a sense of purpose – sharing what they know happens in a familiar story.
Challenge: Cooperatively working with others-playing the game fairly. Moving your counter the correct number of jumps and from the right starting point.
Support:
• Explicitly teach the strategies needed to play a board game

So what will we do to get there?

Design the teaching and learning plan

Practise strategies used when playing board games as a class or with a partner.
Re-reading, sequencing and dramatising the Very Hungry Caterpillar story to enable them to answer comprehension questions.

The hungry caterpillar partner game - **three entry points** for successful achievement of mathematical / comprehension outcomes and engagement in learning.

- Roll a 4 dot dice.
- Scaffolded learning.
- Each turn move on from where you landed.

- Roll a 6 dot dice.
- Work with a partner.
- Work out how many dots and move your counter that many spots along the caterpillar and share what happens in the story.
- Next turn move on from where you landed.

- Roll two 6 dot die.
- Work with a partner.
- Work out how many dots altogether and move your counter that many spots along the caterpillar.
- Move your counter back to the start after sharing what happens in the story.

Very Hungry Caterpillar Three Entry Points to Learning

Aligning *what* and *how* of teaching and learning in the Australian Curriculum

What is the intended learning and why is it important?

Students will:
• understand the importance data collection has in everyday life i.e. popular show bags are repeated each year, unpopular ones are discarded.
• practise counting to consolidate and learn new strategies to use when combining quantities – counting on, the secret code.

What do we want them to learn?

What do they bring?

• Different abilities to connect number names, numerals and quantitites.
• Prior knowledge of graphing – the chameleon data collection.

What could the intended learning look like at this level?

Reception: ACM
Collect data and answer questions about the information. (ACMSP011)
Represent practical situations to model addition. (ACMNA004)
Understand the counting process by naming numbers in sequence. (ACMNA001)
Connect number names, numerals and quantities up to 10, then beyond. (ACMNA002)

How will we know if they got it?

What evidence will enable us to assess the intended learning?

• Photographs
• Observations
• Work samples
• Human graph

How will we engage, challenge and support their learning?

Designing a caterpillar using your name letters as body segments.
Creating a human graph outside.
Challenge: The weather!
Support:
• Counting strategies – 1:1 and counting on.
• Some students to find their group.
• Adding together of two amounts.
• Recording process.

So what will we do to get there?

Design the teaching and learning plan

Count how many letters in your name, record on a card and then find others with the same number. As a group form a line to create a human graph. Interpret the data. Three entry points – count how many feet on 1 or 2 caterpillars then record how many as a number or represent as an adding together process.

How many feet does a caterpillar have?

Task: We made a caterpillar using the letters in our name for body segments. We counted how many letters and looked for friends with the same number. Then we made a human graph on the oval.

(It started to rain when we were lining up and the numbers washed off our whiteboards – it spoilt the fun as we got cold!)
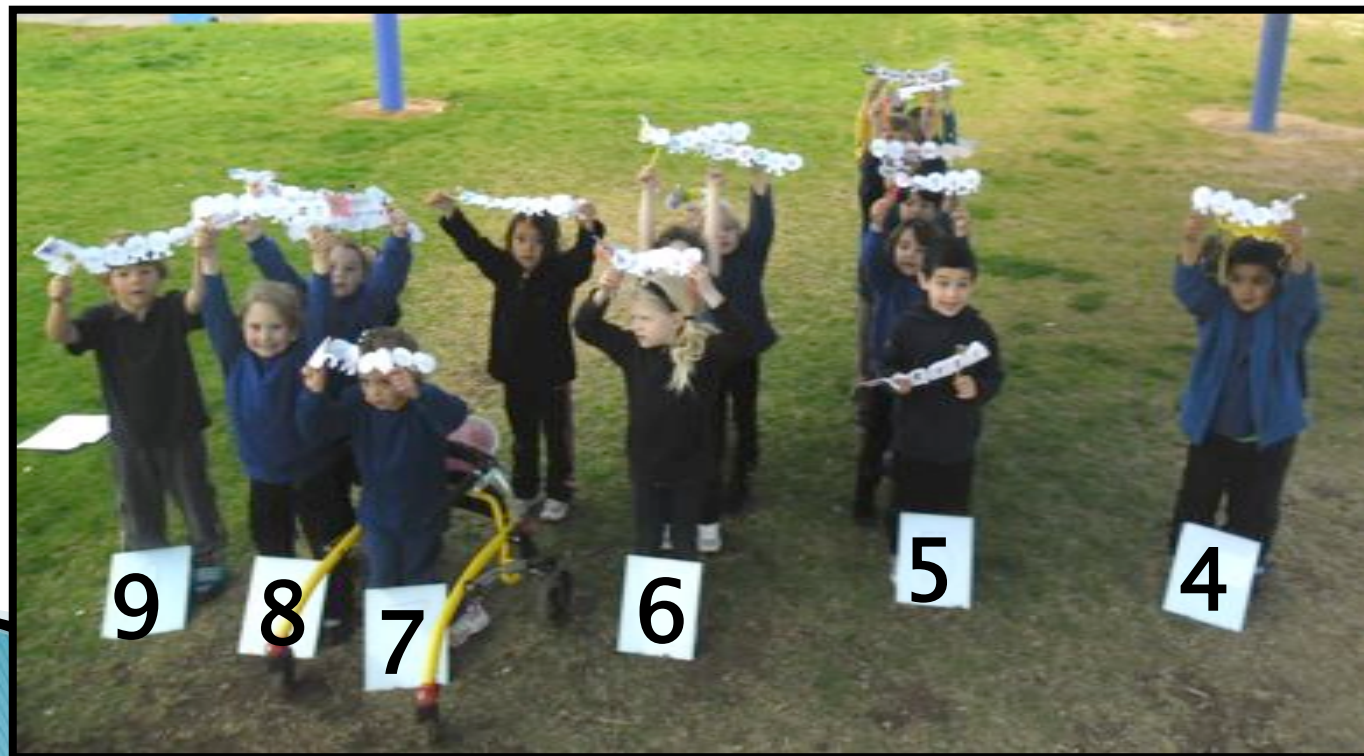
We found out that:
...there was only 1 person who had 9 letters
...5 letters had the most
...we (6 letters) had the same as 8 letters
...we only had 2 names with 4 letters

Can our butterfly fly?

Task: Make a kite to fly with a special person on Fathers' day. (Authentic learning!)

Krush is trying to work out using his fingers how many more streamers he needs to make 7.
(In the fair test his kite flew well – his streamers were all in the middle of the butterfly.)

Danielle is sticking on her kite tail. She needs 7 different length streamers.
(In the fair test her kite did not fly as well as the ones with a tail in the middle.)

Hayley is measuring her kite string. A friend holding onto the other end of the string is standing on a masking tape line at the front of the room. Hayley stretched the string until it reached the back wall.
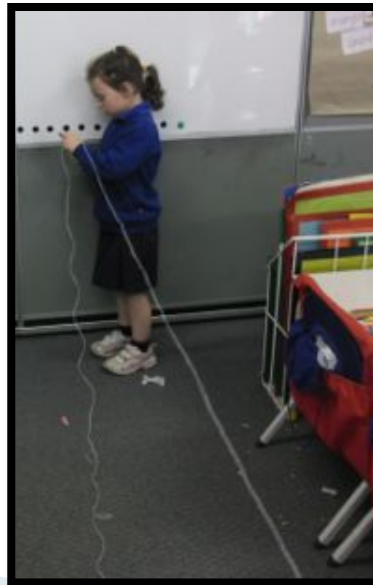
Adam helped Billy make his kite. He counted the streamers and knew when he had put 7 on for the tail. He was very proud of his kite.

"Billy, I hope you have lots of fun flying it!"

Aligning *what* and *how* of teaching and learning in the Australian Curriculum

What is the intended learning and why is it important?

Students will:
• be able to make mathematical connections with familiar shapes they see or use (a dice is a cube, a hoop is a circle).
• bring what they already know when subitising small collections (how many in 1 or 2 groups.) They are using this skill when playing family / school games with dice.

What do we want them to learn?

What do they bring?

Prior knowledge of shape (circles, box for cube).
Some will have explored making 3D shapes with the geo shapes in learning through play.
Subitising skills from playing dice board / learning games at home / school.

What could the intended learning look like at this level?

Reception
ACM
Shape-sort, describe familiar 2D / 3D shapes.
Contextualised learning inquiry to create 2D / 3D shapes/objects
(ACMMG009)
Subitising small collections.
(ACMNA003)

How will we know if they got it?

What evidence will enable us to assess the intended learning?

• Photographs
• Model
• Brainstorm
• Anecdotal notes
• Observations-self reflection
• Feedback to students to support / consolidate/ celebrate learning

How will we engage, challenge and support their learning?

Engage: Students have a sense of purpose-the ladybird needs friends / a home.
Challenge: Manipulating shape in the design process
Support:
• Embed the language of shape.
• Model making the ladybird/home.
• Scaffold construction of designs

So what will we do to get there?

Design the teaching and learning plan

Consolidate circle properties.
Create a 3D circle Ladybird dice.
Explicitly introduce a cube.
Discuss similarities/differences of a circle/cube.
Experiment with geo shapes to make a cube.
Design a home for the Ladybird that looks like a cube.

The Bad Tempered Ladybird

Task: Experiment with joining shapes to make a home (cube) for the your ladybird.
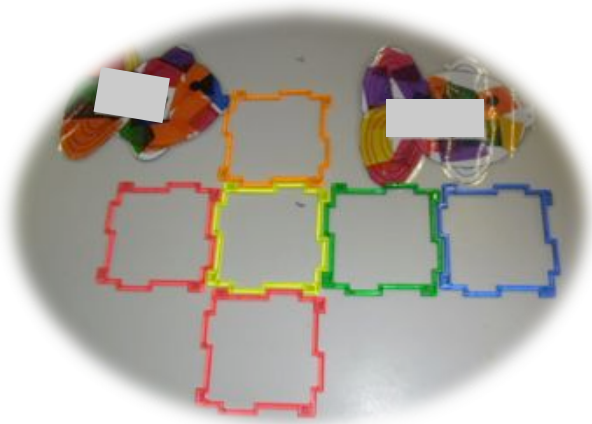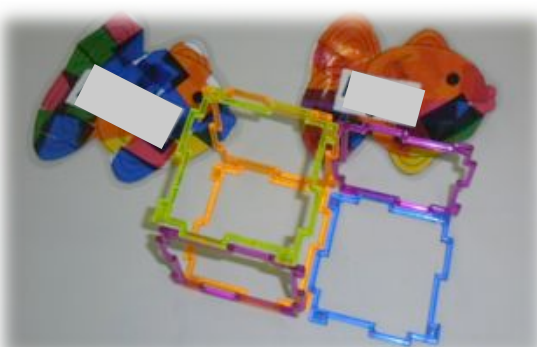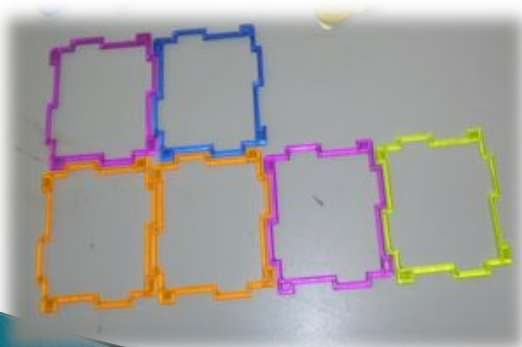

Student Reflection:
"It was hard to click them together" Kathryn
"I already knew how to make a box" Jack

Teacher Reflection:
Attitude: Jack took control of the task and joined the pieces. Kathryn offered some advise, but Jack adamantly informed her why where he was joining was the best solution.

Skills: Both students knew it was a cube and how many shapes they needed to use to create the *home*.
They worked out how to make the cube by experimenting with some of Kathryn's ideas- when they didn't work Jack did it his way.

Student Reflection:
The challenges they encountered:
"It was hard joining them together" Naomi
"It just wouldn't work-we had open bits" Helen

Teacher Reflection:
Attitude: They persevered and kept trying different ways. There was lots of constructive discussion but they couldn't connect their thinking with how to solve the problem. They were happy with their house in the end and said the open bit could be the "way to get in".

Skills: Both girls knew they used 6 squares. Helen said "it's a new shape we made up!"

Had too many spots!

Creating a Ladybird 3D object

Task 1: Put no more than 10 spots on your ladybirds. You need to be able to count how many spots altogether.

Task 2: Cut out and paste your ladybirds together to make a 3D dice.

Shared his spots unfairly

Can count to 3

Maintained intense activity

Said "two"

These two girls were proud, they made the ladybird friends by themselves!

WOW!

It was time to design a home for the ladybird

Task: Make a home for your Ladybird Friends. To pass the fair test you have to be able to open and close your home (cube/box).

Engagement:
• This activity was challenging - throughout the process I observed intense activity from most students.
• Some asked for help – cutting, folding, holding while they sticky taped.
•I observed lots of discussion and noticed they showed/helped each other.
• There were two who needed help to get started and lots of encouragement to keep focussed.
• I adjusted the task and scaffolded for some students – they successfully completed the task.
Everyone was proud of their finished product!

"I don't know if this will work?"

"Can you help me hold it together it?"

"It's hard to fold together!"

"This bits tricky!"

Linking to other curriculum areas – Design & Technology

The Ladybird Toss

Task: Toss your ladybird and tell your friend how many spots on the two you can see. Then tell them how many altogether.

Swap with a friend and repeat the process.

It was FUN!

Student choice: Timmy made up the Ladybird Toss.

Skills: Jack subitised, responding immediately how many spots he could see on each side – 4   4.
Kane (his partner) said "double 4 is 8" straight away.

Skills: Naomi subitised, responding immediately how many spots she could see on each side – 4   2.
To find out how many altogether she touch counted to add the two amounts.

How did we feel when were doing these activities?

"It was easy to make the ladybird dice"

"I used my jacket for the house-the box was too hard!"

"I liked helping Kathryn and Mark make one"

(*Big smile*)"Look Julie" (*She was very proud*)!

"Putting the sticky tape on to join the sides was tricky!"

"It wasn't very easy to make the cube."

"It was hard to join the ladybirds"

"I needed help to fold the sides."

"I need help"

"I'm not really clever at that."

"Making the box with the sticky tape was hard."

"I was happy-I had a Ladybird house."

"There were no tricky bits". (even though someone helped her)

Could our Ladybirds live in the Engagement Tree?
"No, we want to take them home!"

Aligning *what* and *how* of teaching and learning in the Australian Curriculum

What is the intended learning and why is it important?

Students will:
• develop awareness that time can be measured in different ways.
• learn the meta-language for clocks – 'hands' not arrows .
• use our classroom clock to tell the passing of time through the school day – needs to be displayed at their level for reference. Those who already know clock time will 'teach others'.

What do we want them to learn?

What do they bring?

• Understanding that clocks tell time.
• Knowledge that time means lots of things i.e. morning, Summer, recess time.

What could the intended learning look like at this level?

Reception
ACM
Connect number names, numerals beyond 10. (ACMNA002)
Using the everyday language of time. (ACMMG007)

How will we know if they got it?

What evidence will enable us to assess the intended learning?

• Work samples
• Brainstorm
• Anecdotal notes
• Observations-self reflection
• Class work

How will we engage, challenge and support their learning?

Motivate students by showing different ways time can be represented – do you know what they are and how they tell/show time?
Support:
• Students through discussion and questioning to elicit their understanding of time and clocks.

So what will we do to get there?

Design the teaching and learning plan

Brainstorm as a class:
•what do we know about time?
• what do we know about a clock?
Draw a clock and tell what you know about it for an adult to scribe.

Can the Bad Tempered Ladybird tell the time?

What do we know about clocks?

The numbers help us tell the time

Clocks have numbers
-1 2 3 4 5 6 7 8 9
10 11 12

A clock can be a circle.

They have 2 arrows

They have bells to. wake us up.

Clocks have glass to protect them.

The numbers tell when to eat.

Samuel

Clocks have numbers to tell the time.

Student Reflection:
Satisfied with her drawing-it looks like a real clock.

Teacher Reflection:
Attitude: Naomi was highly motivated-she was confident as it was in context with real life experiences and she knew what a clock looked like.

Skills: She knew a clock had arrows to turn to the time and that the numbers went to 12. She nearly has the numbers spatially represented around the clock – the 12 is at the top.

Student Reflection:
She was happy because her drawing was big and it was easy to write the numbers.

Teacher Reflection:
Attitude: Kathryn brought her understandings of clocks from regular personal experiences that use time to measure what she does with the physio.

Skills: She knew that a clock has arrows that point to numbers and tell us what the time is. She wrote numbers to 12 that went halfway around the clock.
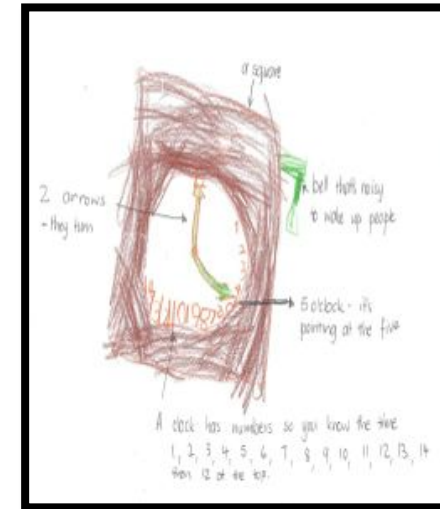
Student Reflection:
"I know what the time is on my clock!"

Teacher Reflection:
Attitude: Timmy enjoys drawing and concentrated on completing the task to his satisfaction.

Skills: "It's pointing to the 5 – it's 5 o'clock. He wrote 1 to 14 on his clock and the numbers go halfway around. He knew that the numbers tell the time and that a clock had 2 arrows. He knew that 12 had to be at the top (wrote it twice-at the top and in the sequence to 14).

Teaching point: Mathematical language – clock face and hands.

The Bad Tempered Ladybird Draw a clock. What do you know about clocks?	**A clock has:** • 2 arrows-they turn • a bell that's noisy to wake people up • has numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 then 12 at the top He said "the time on his clock was 5 o'clock" 😀	**A clock has:** • arrows to turn to the time • numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 • glass to protect it	**A clock has:** • numbers from 1 to 12 • arrows to tell what the time is • glass
A clock has: • arrows to tell the time • numbers to see what the time is • a circle in the middle to make the arrows sty on	**A clock has:** • a circle in the middle so the arrows can move • glass, so the clock can be protected • alarms to make noise to wake people up • arrows and numbers to help us tell the time	**A clock:** • **is round** • **has hands** • **has numbers to say what's the time!** **(verbalised-unable to draw a clock)**	**A clock has:** • glass to protect it • numbers 1, 2, 3, 4, 5, 6, 7, 8, 9. 10, 11, 12, • bells – it will wake me up when it is time for school • arrows to point to numbers to tell what time it is
A clock has: • bells that ring to wake us up • a cover to protect it • arrows to 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 13, 14, 15	**A clock has:** • arrows-the reason why it needs arrows is to tell what the time is • numbers-to show what time it is • 9 numbers • 2 arrows • legs	**A clock has:** • glass to protect it when the glass gets off it gets smashed • numbers 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20 to tell Sebastian when to eat	**A clock has:** She had limited interest in the task – went for family photograph just before the task started. • arrows to tell the time • bells
A clock has: • bells for an alarm • arrows to tell what the time is • numbers that help us tell the time	**A clock has:** • bells to wake us up • numbers to help us know what to do • arrows to point to the numbers	**A clock has:** • bells to wake me up • a hook to hang it on the wall • numbers that the arrows point to tell the time	**A clock has:** • legs • numbers 1, 2, 3, 4, 5 • a circle shape
A clock has: • numbers – eleven numbers • 2 arrows • wood around it Didn't know why she had more than 2 arrows on her clock. She wrote 12 on her clock-asked what number it was?	**A clock has:** • **hands and numbers for the time** If it had no hands it wouldn't be able to turn and we wouldn't know the time	He told me his drawing was "a clock"	

The Wise Old Click Beetle is showing the Very Clumsy Click Beetle how to flip

Task: Get 6 counters – 5 the same colour and 1 a different colour. Flip the small beetles into a bowl using the different coloured counter. Add a block to the tower to represent how many times you flipped a beetle into the bowl.

"It was hard to flip them in."

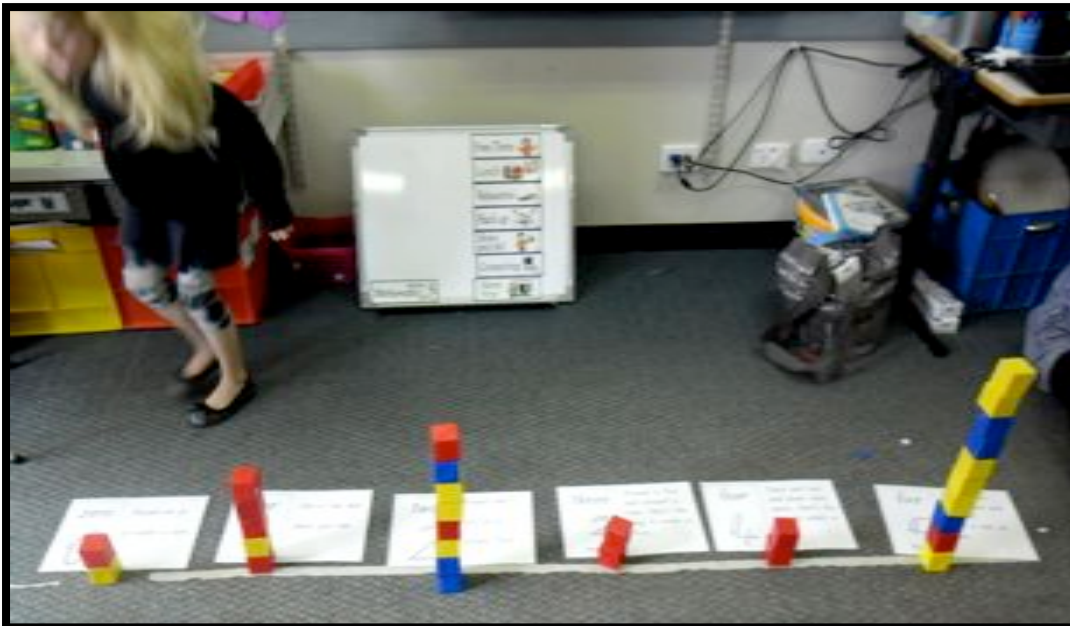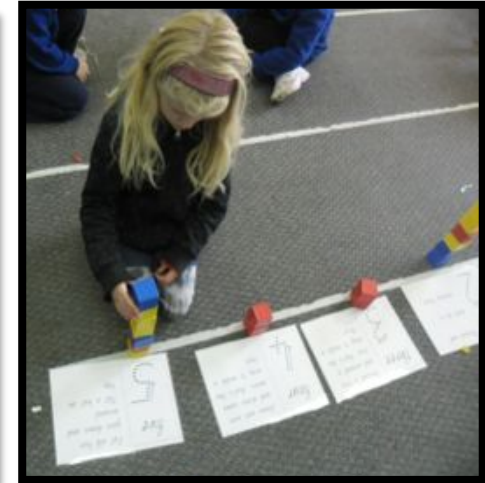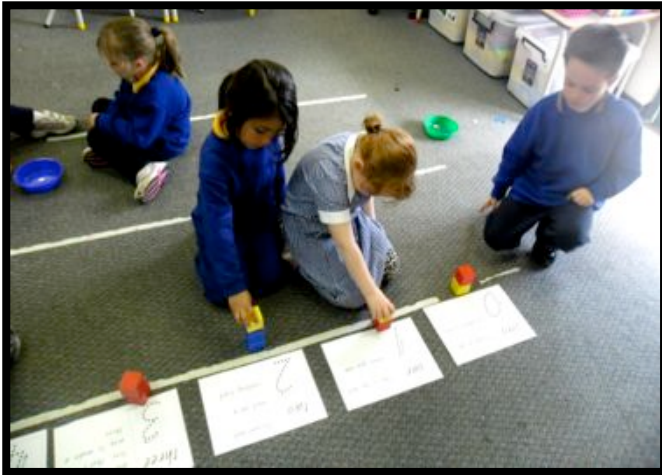"This is fun!"

"Julie, I like doing this!"

"I got 5 in the bowl!"

"I missed all mine!"

"They keep going over the bowl!"

Building our Block Graph

We found out that:
- The 5 tower had the most. (Eileen)
- Deborah counted how many the tallest tower had - 10.
- Three groups had the same -2. (Ingid)
- That means equal. (Kane)

The tallest tower kept falling over-we couldn't solve the problem, but had fun trying!

Timmy said "This was like when we lined up on the oval except we used blocks to show how many."

Brown Bear, Brown Bear what do you see?
I see a goldfish looking at me.
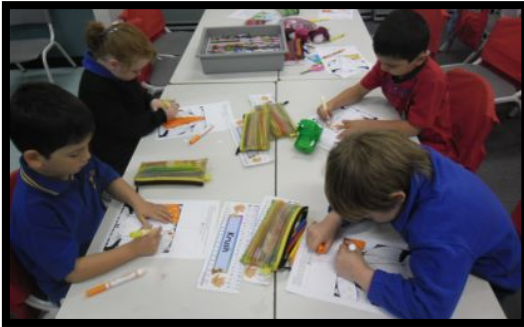
Task 1: Make a goldfish. Fold in sequence from 1 to 5.
The folding was tricky - we had lots of adult help.

Task 2: Throw your fish and draw a line from your starting point to where it landed. Then measure using foot lengths how long your line is and record.
• Lots of students left gaps between their feet when measuring.
•Everyone counted correctly, but needed support when recording.

Brown Bear, Brown Bear how far did you throw your goldfish?

Task 3: Measure the distance again using foot steps.
We found out that the two numbers were different because our steps are bigger! (Imogen)

How I felt about the task:
• "It was fun throwing the goldfish. It 'spinned' around and didn't go far." Julie
• "I had more foot lengths (9) than steps (4)." Isabella.
• "Mine went a long way!" Zaki
• "13" Billy
• "It was easier to measure using foot steps." Krush

Student Reflective Report

• Which mathematical task did you like exploring the best?

• Were any of the learning tasks hard to solve or tricky in some way?

I liked getting my award.
I got upset when I made my ladybird - it was hard to make.

I liked making a cube house for the ladybird.
It was tricky to sequence the caterpillar story.

I liked making the ladybird dice.

It was tricky to make the cube house.

Putting the 5 oranges in groups was easy.

Making the ladybird house was hard - it was tricky to put together.

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