



Example 12: Technology, Level 1 - Making and evaluating a biscuit

FROM THE ONLINE RESOURCE *INCLUSIVE PRACTICE AND THE SCHOOL CURRICULUM*

This example demonstrates how a teacher used differentiation and adaptation in a practical technology session to support all her students to explore the idea that food can be a technological outcome. She was focusing on developing the students' understanding of technological outcomes and processes.

Task

The task was to create a new technological product: a biscuit that might not have been made before. Students were also asked to evaluate the final outcome and the process they had followed. Miss Peacock wanted her students to realise that food could be a technological outcome in a fun and practical way. Within this session, the students created a new type of biscuit from a selection of six possibilities. They selected a filling and decorated the top to create their own biscuit that looked great and tasted 'yummy'. To achieve this, they had to discuss together and trial and test their biscuits. In the discussion, students were identifying the attributes of a good biscuit – look, taste, shape, texture, size, and so on. This gave them a context to develop their understanding of attributes and extend their technological literacy.



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The task was appropriate for students working at level 1 of the curriculum in technology. Carefully selected differentiations and adaptations supported the meaningful participation of students working at a different pace or level of understanding from their peers.

New Zealand Curriculum objective

- Investigate a context to communicate potential outcomes. Evaluate these against attributes; select and develop an outcome in keeping with the identified attributes (Technological Practice, Outcome development and evaluation, level 1).

Opportunities to use and develop key competencies

Students were *thinking* as they asked questions to clarify their understanding about what they needed to do and as they built on what they already knew to ensure their biscuit tasted nice and looked good. Students were *participating and contributing* when they worked collaboratively to create a delicious biscuit.

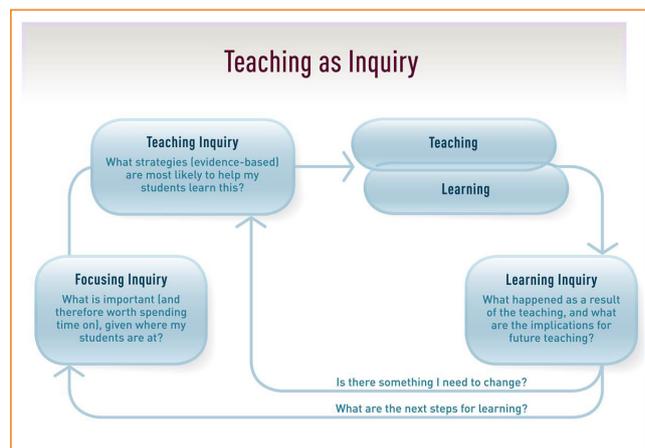
Class description

Miss Peacock has a year 1–2 class of 23 students.

- **Kaija** has multiple challenges that have implications for how she learns and the support she requires. They impact on her ability to communicate, to process information, and to attend to and stay on task. Kaija is mainly non-verbal and uses a communication board to express herself. She has a walker and a wheelchair for mobility. She has very high needs and receives additional support through the Ongoing Resourcing Scheme (ORS), which includes teacher's aide and specialist teacher time. The specialist teacher spends time in the classroom to support the teacher, the teachers' aides, and Kaija's peers to become more confident communicating with Kaija using her communication board. The classroom team is supported by a multidisciplinary team from the local Ministry of Education office.
- **Molly**'s development was progressing normally until a near-drowning event when she was four and a half. She now has difficulty concentrating and learning. She has a mild hemiplegia which affects her coordination and balance, and she needs some help to transition from the floor to standing. Molly has a recognised claim through the Accident and Compensation Corporation (ACC), which provides the school with teacher's aide funding and other support. She has difficulty attending to tasks and processing teacher instructions. She requires additional support to actively engage in most tasks and is working towards the level of understanding that most of her peers are at.

Teaching as inquiry

Miss Peacock used a range of evidence-based strategies to support all her students to access the key technological ideas within this lesson. She wanted students to identify and describe potential outcomes that were in keeping with the chosen attributes and then make a product with these attributes. Throughout the teaching and learning, she connected with students' prior knowledge and adapted teaching and task materials to maximise opportunities for all the students to make a biscuit based on criteria for appearance and taste. The learning was assessed in a variety of ways with high levels of student involvement, and expected responses were differentiated for one student.



Miss Peacock knows her students well and understands their likes, dislikes, strengths, and barriers to learning. Based on this knowledge, she organises the class into mixed-ability groups that allow each student to contribute. Some students are able to work in pairs but not groups, and Miss Peacock pairs these students to complement their skills (for example, a student who is good at following instructions with a peer who needs support). Miss Peacock was very aware that for this unit to be successful there needed to be lots of discussion at each stage of the process, especially the trialling stage. She scheduled the lesson for a day on which a student's grandmother and a teacher's aide were working in the class. She asked them to each work with a group and modelled how to question the students to hear their thinking in the biscuit-making process.

Focusing inquiry

What was important (and therefore worth spending time on), given where Miss Peacock's students were at?

From her observations of the class and her knowledge of each learner, Miss Peacock realised that she needed to support several students to understand the process of making a biscuit, to work with others, and to then evaluate the outcome. She thought about the range of abilities in her class for working independently and collaboratively. Some students require additional support, so she considered what she could differentiate or adapt to help them work with others. She also realised that she needed to model and use a speaking frame to support some students to converse with their peers when evaluating the process and product.

Teaching inquiry <i>What teaching strategies (evidence-based) helped Miss Peacock's students learn?</i>	Learning inquiry <i>What happened as a result of the teaching, and what were the implications for future teaching?</i>
<p>Connecting to prior knowledge and key language</p> <ul style="list-style-type: none"> Miss Peacock introduced the concept of exploring a new food product through discussion about some well-known biscuits. She brought packets of biscuits to class for this discussion and to prompt ideas about how a company creates new biscuits. She introduced the concept of attributes by creating a mindmap on the smart board using the Popplet web tool. She grouped the students' comments about the biscuits by look, taste, shape, and texture. The students discussed how people get ideas for new products from thinking and talking together and that the testing and trialling process includes deciding whether an outcome should be developed further. Through this discussion, Miss Peacock elicited students' prior knowledge and connected with key technological ideas. 	<p>Miss Peacock: <i>Student engagement in the task was high. The students started talking about what they liked and disliked in biscuits. They decided that it would be a good idea to evaluate the taste of the biscuits after they made them.</i></p>
<p>Adapting strategies and materials</p> <ul style="list-style-type: none"> Miss Peacock provided visual support by displaying the sequence of the task on the whiteboard, with each step shown by a photo and a caption with instructions. 	<p>Miss Peacock: <i>I am going to use this approach in all subjects where possible. Breaking the task into steps added structure to the lesson. It allowed the adults in the room to see that everyone could manage the task, and it helped us see at which stages of the process we might need to provide support.</i></p>

The teacher provided support so that the students could use their prior knowledge and interest to access the task.

With your colleagues,  discuss: How can you build on students' interests and personal experiences to scaffold new learning?

The teacher provided visual and practical support to ensure that all students could approach the task step-by-step.

Teaching inquiry <i>What teaching strategies (evidence-based) helped Miss Peacock's students learn?</i>	Learning inquiry <i>What happened as a result of the teaching, and what were the implications for future teaching?</i>
<ul style="list-style-type: none"> Miss Peacock adapted the whiteboard instructions for Molly and Kaija. Both students had the instructions on a small visual board in front of them as they worked with a partner. At the completion of each step in the process, they took turns pulling the instructions off the board and inserting them in a post box. 	<p>Molly: <i>I liked doing the biscuit with Amy. She helped me do the step (in the biscuit-making process) and she said "What next?" She does high-fives and makes me laugh.</i></p> <p>Kaija's mum: <i>We are using a similar visual sequence at home to help Kaija go to bed. This simple sequence of photos and a post box has made our lives so much easier and can be used in lots of ways.</i></p>
<p>Supporting peer interactions</p> <ul style="list-style-type: none"> Miss Peacock used speaking frames to support student conversations when evaluating the biscuits made at the trial stage. She had several sentence starters on strips of paper. As she and the other adults in the classroom worked with groups of students they modelled a comment or question that used the sentence starter and gave a copy of it to the students to refer to. The speaking frames encouraged students to use and extend attribute terminology. Examples of the sentence starters included: <ul style="list-style-type: none"> My biscuit looks ... My biscuit tastes ... Why did my biscuit ...? Miss Peacock made adjustments to ensure Molly could use the speaking frames. She ensured there were no more than three words in the starter, and she repeated it twice before the student held it and said it. Molly was also given a talking stick to hold when it was her turn to speak. Each week, the specialist teacher works with Miss Peacock to decide on new vocabulary items for Kaija's communication board based on the classroom programme and themes. This week, they added 'biscuit' and some simple attributes such as 'yum' and 'yuck'. 	<p>Miss Peacock: <i>This was the first time I have used speaking frames, and they generated more conversation between the students than normal. I heard two students discussing why their biscuit broke and what they could do to fix it. It was great to hear the students' rich descriptions of attributes when evaluating their biscuits.</i></p> <p><i>The scaffolding these starters provided enriched the learning. I will use them in so many contexts. As the students become more familiar with them, I will have a box of laminated ones that they can use in independent reading and writing activities to question each other.</i></p> <p>Miss Peacock: <i>Molly was very excited that she could talk to a peer, as usually she needs support to ask a question. The next day at news time, she asked if she could use a speaking frame. Of course I said yes.</i></p> <p>Molly: <i>I liked holding the talking stick. When I had it in my hand, it was time to talk.</i></p> <p>Miss Peacock: <i>Initially I used the talking stick just with Molly and her partner. By the end of the week, many students had a talking piece when working in groups. It was like magic – they wouldn't speak if they weren't holding it. I still need to work on a strategy to get them listening to the speaker, as often they are more focused on getting the talking piece!</i></p>



With your colleagues, discuss: What do you need to do to make sure tasks in technology are accessible to **all** your learners?

The teacher used speaking frames to support students' conversations about the task.



With your colleagues, discuss: How can peer interactions provide opportunities for **all** your students to contribute to technology tasks?

Teaching inquiry <i>What teaching strategies (evidence-based) helped Miss Peacock's students learn?</i>	Learning inquiry <i>What happened as a result of the teaching, and what were the implications for future teaching?</i>
<p>Allowing for multiple ways of responding</p> <ul style="list-style-type: none"> In Kaija's group, Miss Black (teacher's aide) modelled comments about the biscuits using the speaking frames and Kaija's communication board. When evaluating in relation to the criteria, Miss Black asked Kaija short questions about the biscuit she had made (e.g., <i>Does your biscuit taste yummy? How does your biscuit look?</i>) 	<p>Miss Black (teacher's aide): <i>It was great to see Kaija so involved in the conversations about the biscuits. One of the students in the small group used Kaija's communication board to make a comment about her biscuit. At the end of the session, Kaija used her board to reply 'yum biscuit' - I have never seen her put two symbols from her board together to make a comment like that before.</i></p> <p>Miss Peacock: <i>The evaluative thinking and concepts in this lesson were more complex than where Kaija is at. But when Miss Black asked yes/no and other simple questions, Kaija pulled the answer from her communication board to indicate her response. I'll show this to the speech-language therapist when she is in next and see if there is anything else we can be doing to support Kaija's communication.</i></p>
<p>Assessing to celebrate learning</p> <ul style="list-style-type: none"> Miss Peacock formatively assessed the students' learning by observing and participating in group discussions during the biscuit-making process. Miss Peacock gave all the students a self-evaluation sheet that linked to the attribute terminology they had used to describe their biscuits. On a sliding scale, they rated their biscuits on the attributes of look, size, and taste. They had a space to write what they would do next time to make the biscuit tastier and better looking. The self-evaluation sheets were put in the students' portfolios to share with family. Students took photos of each other holding their biscuits, using the iPad. With the Story Creator app, they then recorded a comment about their biscuit or added a speech bubble and the word for what it tasted like. Molly completed this task with verbal support from one of her peers. Each student's photo story was shared with their family via email. 	<p>Miss Peacock: <i>I noticed that one of the groups had biscuits that were overflowing. I asked the students why they thought that had happened and encouraged them to explain what they would do differently next time. Molly's group used thin biscuits that broke when sandwiched with peanut butter. Molly was able to explain what happened to their biscuit, and her partner explained why this had happened and that they would use ginger nuts next time to make the biscuit stronger.</i></p> <p>Molly's mum: <i>I love getting the stories and snapshots from school that show what Molly is learning. I looked at the biscuit story with her and she could tell me all about the biscuits and why she will use ginger nuts next time so the peanut butter won't break them. This was so cool, as usually Molly doesn't talk in this much detail about school.</i></p>

The teacher differentiated the expected response so that a student could meet planned learning outcomes.

Read more about ways to [differentiate the classroom programme](#).

With your colleagues, discuss: How can you tailor activities to support appropriate learning outcomes for **all** your students?

The students completed self-evaluation sheets, which were shared with their families.

Read more about how [perspectives of whānau](#) help build a rich knowledge of students' capabilities, needs, and aspirations.

Teaching inquiry <i>What teaching strategies (evidence-based) helped Miss Peacock's students learn?</i>	Learning inquiry <i>What happened as a result of the teaching, and what were the implications for future teaching?</i>
<ul style="list-style-type: none"> Miss Black added some additional photos of Kaija's communication board and recorded a comment about how Kaija used her new vocabulary in the lesson. 	<p>Miss Peacock: <i>As well as emailing Kaija's story to her mum, I also sent it to the specialist teacher. One of Kaija's IEP goals is to learn and use new vocabulary that enables her to engage and communicate with her peers in classroom activities. This story shows Kaija is making good progress with her goal. We'll ask Kaija's mum if we can share this at her next IEP meeting.</i></p> <p>Kaija's mum: <i>Wow, great to see Kaija using her communication board to talk with the other students.</i></p>



With your colleagues, discuss: How do you ensure meaningful assessment to celebrate learning for **all** your students?

Next steps



Now that you have explored this example, work with colleagues to:

- consider the challenges and opportunities in relation to inclusion for *your* students
- decide on the next steps in your social sciences teaching to ensure *all* your students are participating, learning, and achieving
- plan for a future meeting to review the impact of your next steps and what *now* needs to happen.happen.

Recommended resources



[Is food a technological outcome?](#) - Teaching snapshot on Technology Online

[Introducing technology to juniors](#) - Teaching snapshot on Technology Online