

# Curriculum Area Report - Science

Term 2 2019

## Science Stand: Planet Earth and Beyond - Light and Dark

What did we teach and what did we want the children to learn?

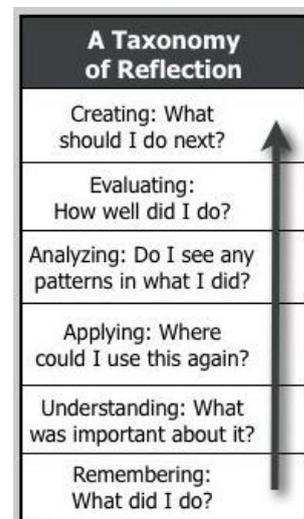
### Team Totara

We wanted our children to learn and understand:

- That the sun is our light source and the importance the sun has in our lives.
- Shadows and how they are made.
- Where light come from - Natural light and man made light

We also wanted our children to:

- Share ideas and ask questions.
- Have opportunities to explore and create.
- Link stories to our inquiry through storytelling.



### Team Kahikatea

The big understanding that we wanted the children to grasp was - *The Sun is a star in the centre of our solar system.* We also wanted the children to:

- identify the planets of our solar system.
- be able to give some reasons why the sun is important for all life on Earth. We need the sun for various reasons (heat, light, plants etc)
- be able to identify light sources and shadow sources.

### Team Miro

We wanted our children to learn and understand:

- How light behaves/refraction/photosynthesis
- Matariki/Space/prisms/rainbows

We also wanted our children to:

- Share their knowledge through Tuakana/teina and collaborative learning activities.
- Aim for our HEART value of excellence.

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Why was it important to teach this theme? What did we want to achieve?

### Team Totara

- It is important for the children to be aware of the world around them, how the sun dictates the pattern of our lives and to understand the Matariki connection with the stars. It was also important that the children share what they know and for us to give them scope to further explore and find answers to questions. We wanted them to work alongside and learn from their Tuakana Teina buddies.

### Team Kahikatea

- The sun is part of the children's world. It was important for them to know that the earth (plants and animals) depend on the sun to live through light and heat. It was also important for the children to know about the dangers that the sun can cause through drought, fire, sunburn etc. This inquiry also had great links to a very special time here in Aotearoa, that is Matariki.

### Team Miro

- It is important for the children to know that science is in everything we do. This topic of study was also an excellent vehicle for launching our new 'HEART of learning'. Inquiry model. We wanted the children to understand light and dark - as a process, it's benefits, how we rely on it and it's many forms.

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## What aspects of learning or what teaching strategies were successful and where could we use these again?

### Team Totara

- Launch approach worked well and was a great springboard to our direction.
- Storytelling East and West story made sense and generated great discussion.
- Working with our buddies.
- Hands on activities - exploring and developing curiosity.
- Use these questioning skills, practical tasks and collaboration with our buddies in the next inquiry or for cross curriculum learning to promote curiosity and thinking.

### Team Kahikatea

- We gathered data in relation to the students prior knowledge and experiences. A pre-test gave a full understanding of what knowledge or little knowledge the children had about the sun and immersion tasks could be scaffolded around this.
- At the start of the unit we used a mystery box with a hidden object to build on the children's curiosity. All teachers took on board professional development in regards to the Inquiry process and about creating a learning rich environment. Our rooms were rich with resources and objects to help stimulate the children's sense of wonder including: library books, readers, posters and dioramas of the Solar System, Youtube Videos, Mystery Doug Science and Google searches were used too.
- The children were given time to explore these resources in an integrated way through many curriculum areas such as reading, writing and art. This inquiry also had great links to our Matariki unit.
- The children investigated and gathered information in small groups in regards to their area of interest/inquiry. The information they gathered was shared through our writing unit (reports).
- The Matariki aspect of this unit is so valuable especially when we have our annual Matariki evening. Parents were able to enjoy their dinner with other families, make connections and see the learning that the children had made over the term.

### Team Miro

- Our Antarctic Centre visit was a success and tied in very well with our focus on 'Light and Dark'.
- We launched the inquiry at a team assembly, where children dressed up as astronauts.
- Teaching strategies that were successful: Tuakana Teina/Think, Pair, Share/The use of experts to explain scientific content-LEARNZ Matariki and Science Hub Matariki/ Kinaesthetic activities/Integration across the NZ Curriculum

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## The HEART of Learning: (New to Board)

Part of our professional learning over the last 6 months has been on inquiry learning. The majority of staff have had experience with teaching inquiry learning, however, we wanted to establish a school wide model and wanted to look deeper into how and what aspects of inquiry we actually do teach and how we could do this better.

The model we went with is the Kath Murdoch Model of Inquiry. We have been using her book, *The Power of Inquiry* as a guide. When we talk about the Inquiry Process we are not talking about achievement objectives. We are talking about the process in which the children learn. The Leaders of Learning have been leading this with the staff. Below is the professional learning presentations on this model.

- [Teacher Only Day -January](#) - To introduce the *Power of Inquiry* and gain an understanding of Kath Murdoch's Inquiry Model through the lens of curiosity.
- [Staff Meeting - 2 April](#) - In this session we looked at how inquiry can be scaffolded. We reflected in a group on what we thought our school wide understanding of inquiry was and used the cultural markers to identify where we thought we were sitting. Then we planned our science inquiry unit for Term 2 - Planet Earth and Beyond, using Kath Murdoch's inquiry model. Teachers were also given some ideas on how to integrate e-learning and maths into your inquiry.



- [Teacher Only Day - 31 May](#) - We renamed our inquiry process to The HEART of Learning, reflected on how we were doing with our "Light and Dark" inquiry. We looked into how to grow the learning assets, the difference between skills and dispositions and how to explicitly teach these and practiced turning a learning intention into a question.

## How well is the HEART of Learning Inquiry Process going?

### Team Totara

- Well - we enjoyed the launch and provoking questions, curiosity and chatter amongst the children.
- Loved using post it notes to record ideas.
- Launch went well and need to develop our assessment and making links to other curriculum areas.
- Matariki Evening made a nice link to inquiry.
- Great, how we can go in any direction based on the learners needs or interests.
- Storytelling linked well with the story we used.

### Team Kahikatea

- The process was teacher lead. Once the class get into a discussion their interest is caught and the direction of learning can change. With juniors you do need to plant the seed first.
- Storytelling and Matariki linked into the theme of Light and Dark really well.

### Team Miro

- The theme of Light and Dark was a great introduction to the 'HEART of Learning'. It was a teacher-led inquiry as the children are learning about the phases. We are also gaining experience in integrating inquiry concepts across other areas of the curriculum so we increase our saturation of a concept and gain learning mileage.

## How well did we do? What does the Achievement data say? Do we see any patterns?

Levels of Achievement in Science						Term: 2 2019
Level 4 (Year 1)						22.4%
Level 3 (Year 2)				3%	22%	34.6%
Level 3 (Year 1)				6%	44%	21%
Level 2 (Year 2)			11%	54%	23%	16%
Level 2 (Year 1)			68%	26%	8%	4%
Level 1 (Year 2)		88%	19%	11%	3%	2%
Level 1 (Year 1)	100%	12%	2%			
	<b>Year 1</b> (52 chn)	<b>Year 2</b> (65 chn)	<b>Year 3</b> (63 chn)	<b>Year 4</b> (70 chn)	<b>Year 5</b> (64 chn)	<b>Year 6</b> (49 chn)

The yellow section indicates curriculum level expectation

[Students were assessed against the Planet Earth and beyond achievement objectives.](#)

### Team Totara & Team Kahikatea

- All students in Year 1 and 88% of children in Year 2 achieved at the expected curriculum level. 12% of Year 2 students achieved below the expected curriculum level.

- Our Year 3 data shows that 79% of students achieved at or above the expected curriculum level and 21% of students achieved below.

### Team Miro

- 63% of our Year 4 students achieved at or above the expected curriculum level with 37% achieving below. For our Year 5 students, 66% achieved at or above the expected curriculum level with 34% below and for our Year 6 students 57% achieved at or above the expected curriculum level with 43% below.

One of the patterns we can see from the data is that, as we go further up the school a third of our children are achieving below the expected curriculum level. In Team Miro we discussed why this might be the case. Below are some of our thoughts:

- Limited life experience for some children.
- Academic vocabulary not a feature of our children generally as learners.
- Students are still developing their research skills as Year 4's.
- Team Miro camps and the level of Term 2 illness amongst learners and staff has had an impact.

## How well did the children do and what do they say about their learning?

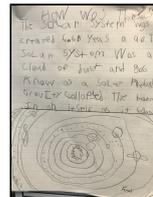
### Team Totara

- Data shows children are working at the expected levels.
- Children's needs were met and some did further learning at home by researching and drawing the planets
- Children enjoyed the process and this approach to learning
- Loved working with Tuakana Teina and completing hands on activities and exploring light in many different ways

### [Link to student voice](#)

### Team Kahikatea

- **F:** *I like learning about space because it is bigger than anything, there is another galaxy called the Andromeda Galaxy that is going to hit us soon. There is a 000000000.1 % chance that it will hit us.*
- **M:** *You can't burp in space I learnt that and you weigh nothing in space.*
- **W:** *I liked asking Mr Collins about the sun because I knew a lot about the sun but I didn't know how long the earth took to move around the sun. I got to learn about the solar system - that there are all kinds of solar systems - there are all kinds of big stars and that there is a solar system.*
- **M:** *It was really interesting because I got to learn about the sun and planets and I learnt that some stars belonged to their own solar system. The sun was hotter than I thought it would be - I didn't think it would be burning hot.*
- **R:** *That the moon orbits the earth. I like the quiz because it was fun. I liked learning about how you can jump really high on the moon. I didn't know that the sun was made out of gases.*



### Team Miro

#### How did the inquiry go?

- Child 1: *It was fine, I still have a few questions, I want to go deeper into some areas to learn more. I like space and the topic but I found it hard to comprehend some of the concepts. I liked learning about the refraction and how light bends due to density.*
- Child 2: *The inquiry was OK, I enjoyed helping out with the wearable arts entry. I helped to plan and make the rocket and learnt the planets and their order. I liked going to the Antarctic centre and learning the differences between the Arctic and the Antarctic.*
- Child 3: *The inquiry was good, I found it confusing searching up information through Google but found the teacher*

taught information interesting. I enjoyed learning about prisms and refraction the most.

#### What do you need to improve on?

- Piecing all of the information together so it makes sense.
- Being able to remember everything so I can do well on the test. I felt I did well on the test it was just challenging to remember everything.
- Catching up on what I missed when I was out of the room.

Tuakana Teina 'Light & Dark' exploration



Wearable Arts- Space



Antarctic Centre 'Light & Dark'



What is our next step? What is the most important thing for Banks Avenue School to focus on in the next few years in this area? How can the BOT support student achievement in this area?

#### Team Totara

- Having time to become more familiar with this inquiry model - read more of the book, The Power in Inquiry and time to practise in class. We need to use the HEART of Learning Inquiry process regularly to see progress in thinking and processes used by the children.
- Integrate all curriculum areas with the inquiry model across the curriculum, making connections for our learners
- Ensure inquiry always has an opportunity to create and explore.
- Linking this to storytelling has benefits.
- Have regular opportunities to teach new skills and give opportunities for children to use and develop new dispositions

#### Team Kahikatea

- Teachers are continuing to learn more about the Kath Murdoch model of inquiry through their professional development. We are developing our own Banks Avenue model of inquiry using her model.
- This unit was so vast and engaging that we could have done with more time to complete some inquiries.

#### Team Miro

- To develop a schoolwide visual of 'HEART of learning' Inquiry process, as we need to continue on this being a focus.
- Give those students who wish to, the opportunity to undertake further learning with 'light and dark' and in the area of Science so they build on their Term 2 learning. This is important as we want to model that learning doesn't stop at the end of each term and that it carries on. Historically terms have often been 'siloes' in terms of learning content.
- Replenishing the lens (concave and convex) and prisms to a set of 15 of each would be useful when completing class activities. It would also be great to have a couple of kaleidoscopes in our science equipment.
- Team Miro would love a set of school lab coats however just having a 2-3 adult lab coats would be a great start to help give authenticity to some of our Science work. This would be good modelling.