

Report On Student Achievement in

Science, Social Science and Technology

Curriculum Context: Ecological Sustainability Aggregation: Term 1, 2019

Key Science, Social Science and Technology Focus
Inquiry Focus: Ecological Sustainability

Environmental Sciences and Issues:

'The impact of Humans on our land and water environment, living plants and animals.'

Conceptual Strands : Sustainability is a critical issue for New Zealand – environmentally, economically, culturally, politically, and socially. We need to learn how to live smarter to reduce our impact on the environment for future generations.

Why focus on education for sustainability?

A focus on education for sustainability:

- can develop learners who are informed decision makers, and connected to the land and the environment
- provides a context that enables meaningful connections between learning areas, key competencies, and values
- offers ways for students and schools to contribute to the social, cultural, economic, and environmental well-being of New Zealand. A sustainable school prepares young people for a lifetime of sustainable living, through its teaching, its culture, and its day-to-day practices

- provides opportunities for students to engage in genuine learning in their communities and take action (the concept of '**so what, now what**')
- uses authentic learning and scenarios to develop creative and critical thinking for a sustainable future.

- Students learn about society and communities and how they function. They also learn about the diverse cultures and identities of people within those communities and about the effects of these on the participation of groups and individuals.

- Teachers should keep in mind five key questions when planning these units of learning
 1. *How is this unit significant learning for these students?*
 2. *What are the big understandings that the unit is based on?*
 3. *What values and key competencies can be focused on?*
 4. *How will I know that the learning has taken place and to what curriculum level?*
 5. *What are the next learning steps for each student that needs to be developed?*

**Main Ideas Contained At Each Level Within the
Conceptual Strands:**

<p>Level 1 Context studied was: “Reduce, Reuse and Recycle” - Year 1</p>	<p>Level 1/2 Context studied was (Years 2, 3 & 4 students) “Endangered Animals”</p>
<p><u>Big Ideas –</u></p> <p>Reduce, Reuse and Recycle – Morris the Messy Magpie (Scenario) –Year 1</p> <ul style="list-style-type: none"> - Understand the concept of waste - Understand the need for waste management - Develop a basic understanding of the terms: 'Reduce, Reuse, Recycle' and how this happens in their home and school - Develop their own creative ideas for reducing, recycling or reusing various 'waste' materials <p>BIG QUESTION: What can we do to help? Discover ways we can reduce, reuse and recycle in the classroom and at home.</p>	<p><u>Big Ideas –</u></p> <ul style="list-style-type: none"> -We are part of the world and can make informed decisions which benefit our environment - There are consequences of our actions, some of these lead to positive changes and some have a negative effect - Everyone has the ability to change or impact on a system, community and themselves - Many of our Earth's animal and plant resources are finite -Changes to the environment affect the plants and animals that live there. -Changes to plants and animals affect the environment where we live. -Our actions affect other species. <p><u>In Children's Terms:</u></p> <ul style="list-style-type: none"> -We are part of a big world -It is important for us to find out about issues in our world -We all need to look after our world: in small ways and big ways -We can make a difference to our world with what we do; both in a positive way <u>and</u> a negative way
<p>Level 3 Context studied: “Warming up – Climate Change” (Year 5 - 6 students)</p>	
<p><u>Big Ideas –</u></p> <p>Cause and Effect:</p> <ul style="list-style-type: none"> -Natural resources are finite. -People influence people and people influence the environment. -Science is evidence based and that evidence influences our ideas and actions. -Businesses impact on the environment which influences people in positive and negative ways. -Reduce, Reuse and Recycle is important in our everyday life. <p>Learning Outcomes and possible themes:</p> <ul style="list-style-type: none"> -Demonstrate an understanding of the water cycle. -Describe finite resources. -Express an understanding of the 'Greenhouse' effect. -Understand the impact of global warming on land area, plants and animals. -Understand and demonstrate that our actions and attitudes, however small, can have an impact. -Ask questions, find evidence, explore simple models and carry out appropriate investigations to develop simple explanations. -Children will take a position on an issue and present a logical argument to support their views. 	

Values - Throughout the unit the following values from The New Zealand Curriculum will be modelled, encouraged and explored:

- **Innovation, Inquiry and Curiosity** by thinking critically, creatively and reflectively to evaluate a process and outcome.
- **Ecological Sustainability**, which includes care for this environment we are connected to.
- **Sustainability** -the ability of individuals, groups, and communities to meet their needs and aspirations without compromising the ability of future generations to meet theirs.
- **Community and Participation** for the common good of the group.
- **Respect** for themselves and others.
- **Equity** – respect for all life, social justice, intergenerational equity, finite resources.
- **Interdependence** – biodiversity, community, cultural diversity, democracy, globalisation.
- **Responsibility for action** – taking action, informed decision-making, citizenship, consumerism, enterprise, resilience, and regeneration.

Key Competencies - Throughout the activities in this unit, there are many opportunities to develop the key competencies identified in The New Zealand Curriculum, in particular, this focus of learning develops the key competencies of:

- | | |
|---|--|
| • Relating to Others | <u>Te Totara Reach for the Stars</u>
Respectful |
| • Participating and Contributing | Always Learning |
| | Smart Decisions |

<u>Social Science</u> Conceptual Strands	<u>Level One Programme</u> Social Science The New Zealand Curriculum (2007) <i>Students will gain knowledge, skills and experiences to:</i>	<u>Level Two Programme</u> Social Science The New Zealand Curriculum (2007) <i>Students will gain knowledge, skills and experiences to:</i>	<u>Level Three Programme</u> Social Science The New Zealand Curriculum (2007) <i>Students will gain knowledge, skills and experiences to:</i>
Identity, Culture and Organisation	<ul style="list-style-type: none"> Understand how belonging to groups is important for people Understand that people have different roles and responsibilities as part of their participation in groups Understand how the cultures of people in N.Z. are expressed in their daily lives 	<ul style="list-style-type: none"> Understand that people have social, cultural and economic rights and responsibilities Understand how cultural practises reflect and express people's customs, traditions and values Understand how the status of Maori as tangata whenua is significant for communities in N.Z. 	<ul style="list-style-type: none"> Understand how groups make and implement rules and laws Understand how cultural practises vary but reflect similar purposes Understand how the movement of people affects cultural diversity and interaction in N.Z.
Place and Environment	<ul style="list-style-type: none"> Understand how places in N.Z. are significant for individuals and groups 	<ul style="list-style-type: none"> Understand how places influence people and people influence places 	<ul style="list-style-type: none"> understand how people view and use places differently
Continuity and Change	<ul style="list-style-type: none"> Understand how the past is important to people 	<ul style="list-style-type: none"> Understand how time and change affects people's lives Understand how people make significant contributions to New Zealand society 	<ul style="list-style-type: none"> understand how people remember and record the past in different ways understand how early Polynesian and British migrations to N.Z. have continuing significance for tangata whenua and communities
The Economic World	-----	<ul style="list-style-type: none"> Understand how people make choices to meet their needs and wants 	understand how people make decisions about access to and use of resources

TABLE OF STUDENT PROGRESS WITHIN THIS STRAND – April 2019

Achievement Level:	Early Level 1	Secure Level 1	Level 2	Level 3	Level 4
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Class Level - Numbers of Students working at each level.

Year 1 (97 students)	42	55			
Year 2 (106 students)		106			
Year 3 (121 students)		24	97		
Year 4 (136 students)		5	130	1	
Year 5 (117 students)			29	88	
Year 6 (122 students)			6	116	

ANALYSIS AND RECOMMENDATIONS

All Students

Number of students assessed across Year 0 - 6 **699 students.**

From the data above the majority of all year levels is either **at** or **above** the Achievement Band Expectation. (688 students at or above expectation Curriculum levels)

Overall throughout the school we have **98.4 %** of the students working **at** or **above** the Achievement band expectation. ***This is an excellent result.***

Male Students (Total: 351)

From the data above the majority of all year levels is **at** the Achievement Band Expectation. (**344** male students at expectation Curriculum levels).

Overall throughout the school we have **98%** of the male students working **at** the Achievement band expectation.

Female Students (Total: 348)

From the data above the majority of all year levels is **at** the Achievement Band Expectation. (**344** female students at expectation Curriculum levels)

Overall throughout the school we have **98.8 %** of the female students working **at** the Achievement band expectation.

Students not achieving at expectation levels – 11 students

Of these **11** students, **7** are 'English as a Second Language' students so often at a lower stage of development with literacy oral/written language development. All of the E.S.O.L. students and **3** of the other students not achieving at expectation levels feature in our Learning Support roll, for curriculum assistance in a number of areas.

E.S.O.L. Learners

On our school roll we have **242** students identified as from a background of 'English as a Second Language.' Of these students **235** are **at** the Achievement Band Expectation.

For our E.S.O.L. students this is a result of **97.1 %** working *at* the Achievement band expectation. Given the language issues and cultural understandings, for many this was their first major inquiry experience, this is an excellent result.

Maori Students:

Number of Maori students assessed across Year 1-6 **91** students. Of these students **90** are **at** the Achievement Band Expectation.

For our Maori students this is a result of **98.9 %** working *at* the Achievement band expectation.

Pasifika Students: **6** students at the time of this unit. All **6** are at expectation level. **100%** at the Achievement band expectation.

For our Maori students and Pasifika students this is a result of **99.0 %** working *at* or *above* the Achievement band expectation. **This is also an excellent result.**

What went well with this unit of learning

This was a very successful unit of learning that was programmed to be worked on for the entire term in Term 1 2019.

- The level of student engagement in their learning was very high as the topic was based in an authentic scenario or issue e.g. in our Junior classes through literature, the story "Morris the Magpie." The context of the story was a great basis for the children's learning about Global Warming. The topic was able to be integrated into students writing and the children learnt new vocabulary from the story. For example; the animals were 'distressed.' Morris the magpie 'collected' shiny things. Walking around the school to look for rubbish engaged children when they found an apple core, a juice bottle in the drain and some paper on the grass. We took photos of the rubbish and discussed what rubbish bin it should go into e.g. compost bin – apple core. The idea of 'reducing' the amount of rubbish we make was quite difficult for them to understand, but they were intrigued about landfills and incinerators, so a lot of their questioning came from images showing these. Lots of oral language discussions were had during this time. We looked at our lunchboxes to see what Mums/Dads/Grandparents packed our lunches in. We talked about containers, plastic zip lock reusable bags, and lunchboxes with compartments and no rubbish. We watched 'The Magic School Bus – Recycling' and discussed why recycling is important.

'See Saw' parent portal provided an activity with bins for recycling which we all had a turn at to show our families at home. We learnt about the recycling logo and looked at the logo on our school rubbish bins. We discussed saving energy (turning our lights out) when we leave the class to go to the library or Matariki. We talked about making sure our door was closed when the heat pump was going to ensure the heat pump was working just for our class, and not further out to the pod or outdoors.

We were able to start off with a small context and broaden it to a world-wide context very easily. Just talking about rivers, oceans and forests in general.

The students all enjoyed ending the unit with a Technology day. Finishing off with reusing a piece of rubbish in a productive way by making it into a container and planting a plant in it which they could take home, was a great culmination.

The unit focused on the development of student's Key Competencies e.g. Matawhero /Orion team

Thinking - Through discussions about what happens to lunch box packaging, children presented their ideas about what lunch order packaging was, where it came from and what we do with it.

Relating to Others - Students worked together to share their ideas, group discussions and active listening was encouraged. Students were respectful of different ideas and solutions for the identified issue.

Participating and Contributing - Students looked at a community issue of how to recycle/reuse and came up with creative actions to support a solution.

Using Language, Symbols and Text - A lot of new vocabulary and visual symbols were shared. The recycling symbols and the number system was explored, the words 'Reduce, Reuse and Recycle' introduced new vocabulary. The recycle symbol was explored and found in places around the school and at home.

- When our Year 2 classes focused on the threats to animal habitats the children could relate it through work they had done in Year 1 around recycling. It was felt the children have a different attitude towards 'our world' than maybe that of 20 years ago. They seem to have a greater awareness of the importance of and how to protect it – even if only in a small way. The children enjoyed learning about different animals and their habitats. It was very interesting watching them do lots of the activities as group work. It gave our teachers a chance to watch them interact and see how they justified their point of view on different things. Some of the E.S.O.L. children were challenged by some of the language and concepts in this unit such as how to protect a bird's habitat. The children were totally engaged in the Technology aspect of the unit. When messages were sent home via Seesaw asking parents to help children get together items for their birdfeeder, we had a number of responses saying that the children had come home buzzing about the project. One child had gone home and started making one by herself that night. The quality of their planning was impressive. It was detailed and included, for some, a comprehensive list of materials needed to make their birdfeeder. When working they all worked independently and had some excellent manipulative skills when it came to making their birdfeeder. The only part the teacher needed to do was cut using a Stanley knife when required. These skills and creative enthusiasm are a positive affirmation of our 'Stars learning' in Year 0/1.
- The Year 3-4 students discovered an awareness of themselves in the world. They learnt that they were part of the animal kingdom. They realised that the actions people take or have taken does have a direct impact on other animals. They worked together in groups to study a NZ endangered animal. This was a great project that they enjoyed. The groups were selected by the animal that they were interested in, rather than them choosing to work with their friends. With this commonality of interest, the groups seemed to work very well. Buddying up students together assisted the reading of information and understanding. They were mixed ability and so the 'more fluent' were able to support the others to access and group similar information. They all took part in the process. The children enjoyed asking their own questions and we did a lot of talking about the difference between open and closed questions. Most of the children understand this difference clearly now and are a lot better at asking open questions than they were at the beginning of the unit. We are using these skills in our Literacy time now too.

Researching and sifting and sorting information was hard for many children at this level and they needed a lot of support. We talked about key words and did lots of searches together using the iPad and Apple TV, also used different books that we had received from the National Library to photocopy pages of and scaffold the children to find the information they required. Once they had researched their animal, they were asked why is their animal endangered? (The discoveries they made were eye-opening for some of the children. Most had an awareness of plastic in the world but they had not considered deforestation as a cause.

The children ended this unit on a positive note. They had already come up with solutions about how they could help the animal they studied but in the next section we looked at wider things we could do to help all the animals in our planet

We made bags out of pre-loved t-shirts. The learning was that we could reuse items – rather than throwing them away. They also realised that it meant that they didn't need to use a plastic bag if they had these new t-shirt bags. Some of the children had noticed that plastic is bad for our sea animals so they were pleased with what we were doing

The children loved this part of the unit. They felt good about what they were doing and loved the finished product. They also came up with some excellent ideas about how to make modifications – although some initially said that they wouldn't change anything because they loved their bag.

The making of the t-shirts really showed differences between the children. Some showed excellent helping skills and perseverance while others got upset quite quickly if things didn't go their way. This was a good learning opportunity – in the end they were all very proud that they kept going and had a bag to take home. Lots of them want to use it for their swimming bag in Term 2.

- In our Year 5-6 classes the focus was very much on a local and global perspective with some major recent changes happening in New Zealand e.g. the ban of single use plastic bags. This topic was a challenge but incredibly relevant to what is happening in our environment, society and all over social media. National Library Books, websites/YouTube, Library Books, Journals, Readers were a huge part of backfilling with information before we took a look at 4 main questions.

How do we know climate change is real?

Why is Climate Change happening?

What are the effects of climate change?

What is being done to solve climate change?

Locating suitable information, texts, articles was a challenge for children at this level, however the National Library Books provided some excellent information to develop and grow our understanding of the effects of humans on our environment.

The children learned about the 'greenhouse gases' and where these come from and how they are affecting the place in which we live. They learned the importance of our polar regions to scientists when measuring climate change and the effect it is having on particular animals.

You Tube documentaries, some developed by children, were informative and increased the children's knowledge further about 'cause and effect' and what we can do as one person, one classroom, one school to begin to make a difference to the world we are living in.

The biggest thing I think the children have taken away from this unit is to be observant, take part and be informed about issues that are going to be a big part of their future.

Children were able to make some great connections with why global warming is happening and the impacts it is having on our Environment. Children understood whilst there is major issue with global warming people are making good changes in order to reduce the impact on the environment. A focus on plastics was a great way to show the students the effects of waste. It also encouraged them that if we all make simple changes these changes will make a positive impact. The unit was a very relevant context and found the students were able to make good connections with what they already knew and build on knowledge they had not yet made links to. The students were able to make excellent links with ways children their age could make realistic, sustainable changes.

This was showcased by the way the students came up with different ideas to upcycle plastic bottles. Most children were able to reflect on their projects and discuss changes that they needed to make in order for the projects to work successfully. The technology aspect was very successful. Most students made a functional item (rather than display object) for either at home or school. There were high levels of student agency with enthusiasm and creativity to the forefront.

- The Curriculum learning for our students was highly integrated, rich and connected.

Curriculum integration occurred with the essential learning areas of **Social Science, Science, Technology** (construction and through digital E Learning research and presentations), **English** (Oral - group discussion dynamics, public speaking through speeches, Written – Procedural explanation, speech writing, letters to relevant organisations and recount writing, Visual - symbols, posters, graphics, Reading - finding and sharing information, in a guided and independent manner.) **The Arts**; Music and Visual Arts. The use of Art by artist Chris Jordan as a Social comment shared with our staff and students, then they created their own comment through art projects, **Maths** through statistical analysis and graphing as appropriate.

- The students felt 'passionate' about the issues they were researching, they felt they could and should make a difference through some form of personal social action. They also gained a strong understanding about their roles and responsibilities in the various communities we are part of, stretching from our youngest learners reflecting on home / school to our middle and senior students reflecting from their immediate environment local links to New Zealand and into the global context.
- Having all term for this unit allowed us to delve through all aspects of our Te Totara Learning Model inquiry process (Our Rocket) from the **ignition** -sparking interest, forming questions, through the **journey** phase finding and recording information, revising, refining and asking more questions to the **landing** which is the presenting stage of the inquiry. Time was taken through all parts of the learning to facilitate and scaffold the process but also to allow an increasing amount of student ownership and agency in their learning.
- Our flexible Technology option of the iPads provided a great resource to support the inquiry at the **journey** and **presenting** stage. Using our bulk sets of iPads as well as the class ones and some students with B.Y.O. devices meant additional iPads for student learning. Teachers could educate the students about digital research skills, key questions, narrowing search options, synthesising information to outcomes and also to view information with a 'critical eye.' Just because an article is on the Internet doesn't mean that it is the truth! These are valuable Digital Citizenship learning. YouTube clips of New Zealand and worldwide environmental issues like Global Warming issues were shared through the Apple TV so that students could be informed and make links to information that is shared almost daily on the world stage.
- The teachers grew their own knowledge of our Te Totara Learning model through the Inquiry Learning process. The staffroom conversations, team and school wide dialogue was rich and detailed about how our learners could benefit from every facet of this unit of work and how we can foster their skill development to become connected, actively involved and lifelong learners. (New Zealand Curriculum Page 8)
- The learning spaces were used in a very collaborative way with the wider pod being used as a 'learning hub' for information gathering and teamwork areas in use. Several of our teams used their teachers across the whole team to facilitate groups of team students under common themes.

Ideas for Future Action of this or a similar unit - (Linked to our future Strategic Planning.)

- Continue this learning journey. Staff continue to develop their knowledge and pedagogy across the broader curriculum areas and what the learning progressions with each Curriculum levels looks like. e.g. as we plan a unit like Ecological Sustainability and use learning theories that as teachers we need to know where we are going to. This is in terms of the end stage learning outcomes or big ideas, then we plan the curriculum step, choosing activities and materials that help foster student learning.
- Fostering and using our own recycling initiatives to educate our students. Tracking our school recycling paper in our class and then watching it picked up by the recycling truck – follow the process of recycling paper. Our school environment provides a lot of what we were focussing on e.g. paper recycling, worm farm, compost, lunch boxes. Collecting compost rubbish and learning more about our worm farm. We are benefitting from our paper recycling through the 'Trees from Paper' scheme and we are awaiting the arrival of 24 trees.
- The understanding gaps of tasks or discussions for E.S.O.L. students confirm the need to continue to receive specific curriculum and vocabulary support from our E.S.O.L. teachers and teacher aides. This is to maximize their learning opportunities in all learning areas. This needs to occur both prior to and alongside the topic learning.
- Continue to foster E learning professional development with the staff through authentic Curriculum contexts. Have a school-wide expectation of the use of E learning, not just as skills based app practice but in a way to research, create, present and extend learning. Support the increasing staff interest and use of E learning by the use of a colleagues, where possible, with acknowledged skills in this area to 'model, work alongside teachers and grow' their own skill. All teachers have a professional goal in Digital Technology linked to their 2019 Job Description.
- This year we have a number of units planned that have elements of inquiry learning in them. Our Learning model will be able to be used to build on the questioning, finding information, synthesizing and presenting findings. These are skills that our students already have shown so much growth in, during this school year. It is envisaged that the momentum we have gained in the Inquiry Learning area this year will be continued through these units and beyond during 2019.

This document on student achievement in Science, Social Science and Technology - Term 1 2019 was reported to the Board of Trustees Meeting on 30 May 2019.

The valuable input of all staff is acknowledged in the preparation of this report.

**Anne Fraser
(Principal)**