##

##  Report On Student Achievement

 Science

**Aggregation: Term 1, 2017**

**Strand: Living World.**

The Living World Strand is about living things and how they interact with each other and the environment.

Students develop an understanding of the diversity of life and life processes, of where and how life has evolved, of evolution as the link between life processes and ecology and of the impact of humans on all forms of life.

As a result they are able to make more informed decisions about significant biological issues.

The emphasis is on the biology of New Zealand, including the sustainability of New Zealand’s unique fauna and flora and distinctive ecosystems.

**Achievement Aim – the classes worked with a range of contexts**

 **across these aims.**

**In their study of the Living World students used their developing scientific knowledge, skills and attitudes to:**

1. Gain an understanding of order and pattern in the diversity of living organisms, including the special characteristics of New Zealand plants
2. Investigate and understand relationships between structure and function in living organisms
3. Investigate how organisms grow, reproduce and change over generations
4. Investigate local ecosystems and understand the interdependence of living organisms, including humans and their relationship with the physical environment.

 **Achievement Objectives At Each Level**

**Main Ideas Contained At Each Level Within The Strands:**

|  |  |
| --- | --- |
| Level 1 Context studied: “Habitat” (Generally Years 1 & 2 students)  | **Level 2** **Context: “Can You Find Me”** (Generally Years 3 & 4 students) |
| *The ‘ Big Ideas’ in the unit:*- Scientists group things according to their evolutionary relationships-All the individuals within any one group of living things share a number of features-Some features used for classification are readily observed and are adapted to their environment-Different types of insects live in different places and eat different things. Some live on land, some live in fresh water and some live in the sea. -Many animals eat insects and people often kill insects.-If there were no more insects to eat, their predators would have to find another food source in order to survive. -Changes to the environment in New Zealand have caused a number of animals/insects to become endangered. **CONTEXT:** We are learning about which animals/ insects/plants can be found at Te Totara and what their natural habitat is. **Specific Learning Outcomes:**Students will understand -There are many different types of animals and plants-Animals are one group of living things-We can group animals in many different ways-All animals eat, grow, move, respond to things around them and reproduce. | *All the preceding ideas, plus:*- Understand that there are special features in an animal’s habitat that helps them stay alive.- Living Things’ have specific structures and features to enable them to survive in their habitat.- Identify physical and behaviour features of animals that enable them to survive in a particular habitat.- Explain how an animal’s ability to survive and how they can be affected by changes in their habitat**CONCEPT: Learners will understand and investigate animal adaptations*** Body Coverings
* Camouflage
* Classification
* Habitats
* Ecosystems
* Human Impact
* Conservation

**CONTEXT or SCENARIO: New Zealand** animals and plants have adapted to their habitat in order to survive. |
|   **Level 3 and 4 (Yr 5&6) Context: ‘Land and Sand’** |
| Big Idea and Key Learning Concepts:-Living things depend on one another and on the environment in which they live. -Changes in any element of the living or non-living environment may affect the relationship between living things and lessen or improve the chances of some species surviving.**Ecosystem: The Sandy and Rocky Shore**- Some beaches have a greater number of organisms living there than other beaches. Every beach has a range of habitats; in each habitat, different kinds of living things can be found - The beach provides each living thing found there with food and shelter. Changes to the beach may affect the ability of living things there to obtain food and shelter. If there are dramatic changes in the population of any species living at the beach, other species may be affected too.**Ecosystem: The Tidal Community including Mangroves**-Changes to the beach may affect the ability of living things there to obtain food and find shelter-If changes to the beach are not too drastic, living things there are able to accommodate or recover. **Ecosystem: The Bush**-The key difference between plant groups is the way in which they reproduce. Plants have distinctive features that relate to this – flowers, cones, or spores. **All ecosystems:** – Plants and animals of the same type have similar kinds of coverings, but these will show differences in such features as colour, pattern, texture and thickness. The variety of coverings exist for purposes related to the survival needs of plants and animals. Changes to these coverings happen at different stages of a living thing’s life history or in response to changes in the environment. |
| ***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 scientific process and outcome*
* ***Respect***
* ***Diversity***
* ***Ecological sustainability***

***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:** ***Managing Self*** *(Managing oneself when doing Scientific observations and research)*
* ***Using Language, Symbols and Text***
* ***Thinking*** *(Predicting, Observing, reflecting, questioning and discussing process/outcomes)*
* ***Participating and Contributing*** *(as an individual and as a group member – active involvement)*

***Our ‘Reach for the Stars’ –**** ***Smart Decisions***
* ***Always Learning***
* ***Self Managing***
* ***Trying your Best***
* ***Respectful***
 |

**Achievement Objectives At Each Level**

**(Science in the NZ Curriculum)**

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**Level One and Two** (generally Years 0 – 2, and Years 3 - 4 students)

**Level Three** (generally Years 5 and 6 students)

**The students will be able to:**

|  |  |  |
| --- | --- | --- |
| ***Level One and Two Programme*****Strands** |  **Science** **The New Zealand**  **Curriculum**  **( 2007)**Students will: | ***Level Three Programme*** **Science** **The New Zealand**  **Curriculum**  **( 2007)** |
| Living World | **Life Processes*** Recognise that all living things have certain requirements so that they can stay alive

**Ecology*** Recognise that living things are suited to their particular habitat

**Evolution*** Recognise that there are lots of living things in the world
 | **Life Processes*** Recognise that there are life processes common to all living things and that these occur in different ways

**Ecology*** Explain how living things are suited to their particular habitat and how they respond to environmental changes both natural and human induced

**Evolution*** Begin to group plants, animals & other living things into science-based classifications

\* Explore how the groups of living things we have in the world have changed over long periods of time and appreciate that some living things in N.Z. are quite different from living things in other areas of the world |

**TABLE OF STUDENT PROGRESS WITHIN THIS STRAND**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Achievement****Level:** | **Early Level****1** | **Secure Level 1** | **Level 2** | **Level 3** | **Level 4** |

***Class Level - Numbers of Students working at each level.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year 1**(117 students) | **10** | **107** |  |  |  |
| **Year 2**(140 students) |  | **140**  |  |  |  |
| **Year 3**(131 students) |  |  **32** | **99** |  |  |
| **Year 4**(131 students) |  | **2** |  **127** |  **2** |  |
| **Year 5**(130 students) |  |  **1**  | **51** |  **78** |  |
| **Year 6**(115 students) |  |  **1** |  **10**  |  **104** |  |

**ANALYSIS AND RECOMMENDATIONS**

**All Students :**

Number of students assessed across Year 1 - 6 **764 students.**

From the data above the majority of all year levels is either ***at*** or ***above***

the Achievement Band Expectation.

(750 students at or above expectation Curriculum levels)

Overall throughout the school we have **98.1 %** of the students working ***at*** or ***above*** the

Achievement band expectation. ***This is an excellent result.***

**Maori Students:**

Number of Maori students assessed across Year 1-6: **88 students**

Of these students **83 are** either **at** or **above** the Achievement Band Expectation.

For our Maori students this is a result of **94.3%** working **at** or **above** the Achievement band

expectation. **This is also a very good result.**

**Pasifika Students:**

Number of Pasifika students assessed across Year 1-6: **11 students**

Of these students **all** are **at** the Achievement Band Expectation. For our Pasifika students this is a result of **100%** working **at** or **above** the Achievement band expectation, also an excellent result.

**Male Students (Total: 389 )**

From the data above the majority of all year levels is ***at*** or ***above*** the Achievement Band Expectation.

(382 male students at expectation Curriculum levels)

Overall throughout the school we have **98.2 %** of the male students working ***at*** the

Achievement band expectation.

 **Female Students (Total: 375)**

 From the data above the majority of all year levels is ***at*** or ***above*** the Achievement Band

 Expectation.

 (368 female students at expectation Curriculum levels)

 Overall throughout the school we have **98.1 %** of the female students working ***at*** the

 Achievement band expectation.

**Students not achieving at expectation levels – 14 students**

Of these 14 students, 2 are ‘English as a Second Language’ students, at a lower stage of development with literacy oral/written language development, 8 of them feature in our Learning Support roll and all of them have been identified within their teaching team with appropriate remediation processes in place. 5 of these students who are not achieving at our expectation levels are new to our school, having enrolled in February 2017. They have now settled into their new environment and remediation programmes as appropriate have begun for them within their learning areas.

**What went well with this unit of learning**

All teaching staff felt these units of work within the Living world strand were particularly motivating and successful for the students because of the practical and familiar study contexts, which were easily accessible to all students. The interest of the students was easy to ignite and the first habitat that was explored at all levels was our own Te Totara school environment and the surrounding areas. Some students were quite fearful of the creatures such as spiders however fear was soon overcome by engagement and awe in the ‘cleverness of their adaptations.’

The students learnt the skill of close observation in order to notice the features of animals, those that were common and those that were different. Excellent oral language discussions occurred when the students noticed the adaptations that different creatures have which allow them to be safe and co-exist in their habitat. Lots of questions and wonderings occurred which sparked research skills and presentations. This was our inquiry skills focus in Level 1. With our middle school learners the inquiry focus was on how to make close observations, the process of information-gathering and the difference between fact and opinion. This often challenged students ‘fixed points of view.’

 A number of ‘Education Outside the Classroom’ (E.O.T.C.) experiences enriched the students’ knowledge as they were able to see the animal species groupings, features and adaptations in their natural habitat. Our Senior classes were challenged to investigate up to 3 different habitats or ecosystems so they could gain an understanding, through a comparative process, that living things are suited to their particular habitat.

Field Trips were taken by our Year 3-4 and our Year 5-6 classes. These included; the Taitua Arboretum (Bush and Stream), Raglan Beach and Harbour (Seashore; Sandy /Rocky / the Muddy tidal flats and Mangroves), Miranda Seabirds in the Firth of Thames (Seashore).

The visit by our Ra team to Pukorokoro Miranda (on the migratory path of the Godwit) was an example of a perfect fit for this learning unit. The teacher at the centre was able to make the connection between features of different bird species and how they were adapted to their habitat, especially in connection to what they ate. The focus work on physical features such as bird beaks and bird feet helped the students to make the feature/habitat connection.

The visit to Raglan and looking at the mangroves was very engaging for the students. They commented that it was an amazing plant in a really difficult zone - it has quite interesting adaptations for where it lives.

 Many of our Learning areas had discovery tables and terrariums set up with common garden insects and plants for the students to observe. The students could clearly see the parts of the plants and insects and were able to investigate how they were adapted for protection from predators, and how they respond to certain things such as light and touch. The students were involved in the collection process and also ensuring that through their research they were making good decisions to maintain the health of their ‘captive’ creatures. This is in accordance with our ‘Care of Animals’ school policy. They were taught that this captivity was not a natural habitat for their creatures so as soon as we had finished observing then the creature was released back to their natural environment.

 The teachers all set up colourful, interactive display areas with different types of support

 material, research challenges and guidelines to help the unit develop into rich

 understandings about ecology, evolution and sustainable environments for certain animal

 species. The impact of human interaction on some species, especially in New Zealand with

 the threatened status of the Kiwi and also the Giant Native snail, was explored

 with the students and some lively discussions occurred around the decisions that we as

 humans make that shape the animal world we live in. The students had noticed the

 earthworks beside the school with large machines and they wondered, with some concern,

 about what was happening to the animal and plant life being impacted on in that area.

Great support resources were used with our school readers, internet, school library and resource personnel such as Tom Lynch, the ‘bug’ expert from Maungatautari who visited our Year 2 classes. Also with the older students Technology was very important. Youtube clips were excellent, also photos of different habitats and the plants and animals that lived there.

In all areas of the school new scientific vocabulary was encountered and unpackaged into sound understanding for the students’ e.g. terms like ‘classifying, life cycle, predator, prey, camouflage.’ Once the students understood the term they were able to classify a number of different objects, not only animals, and discuss this with each other. They could understand the links between the adaptation of creatures and how this protects them from their natural predators. The students began to ‘think and interpret like scientists.’

 It is very interesting to explore the notion of living and non-living with children. This is an area of challenge and growth for students as their assumptions are often incorrect e.g. in one junior class one criteria suggested by a child was that ‘living things have to move around to be alive.’ A hands up / eyes closed assessment showed a large number of the students in the learning area believed this to be true. Once it was established that plants were alive but they didn’t move around, it was accepted that movement was not vital to be alive. This also led to vigorous debate in some of our Senior classrooms based around the MRSGREN definition (Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion and Nutrition. Many students were adamant that fire was living as they believed that it met the MRSGREN criteria!

 Our E.S.O.L. students benefited from some prior knowledge and specific vocabulary

 teaching by our E.S.O.L . teacher before the unit began. This helped to prepare them

 for the learning. Two of the students who were below expectation level were E.S.O.L. learners in Year 6. Of particular note is that whilst they were not achieving at expectation Level 3, they were achieving at Level 2 which is certainly a solid level of learning for them.

Curriculum integration occurred with the essential learning areas of Science, Technology (with the creation of a design brief to make a creature with survival features or a predator trap or an animal feeder or enclosure), English; Oral discussions and conclusions, Reading, Research, Presenting, Writing; Procedural and Report writing and Mathematics, STAR’s learning, The Arts ; Visual (observational drawing by sketching and modelling )and Movement programmes.

Learning was shared with our families through the Seesaw app where students were provided a platform to record and showcase their learning journey. The iPad COWs were also used widely to maximise the number of devices in the research and presentation phase of this unit

 By the conclusion of this unit of work the students had gained an excellent understanding of the features used to classify their groups of animals and how these particular features help them to adapt and survive in their environment. Some excellent learning growth occurred which stretched our more capable Science students into some early Level 4 objectives.

**Ideas for Future Action of this or a similar unit** (Linked to our Strategic Plan)

\* Continue to tap into resources, personnel and E.O.T.C. experiences that can enrich the programme and assist in developing confidence and skills in staff and students. An interchange of teachers with scientific skills can be considered as well as the bringing in of ‘experts’ and E.T.O.C. experiences where we take the students to the ‘expert knowledge and their environment.’

\* Specific professional development in scientific areas for teachers. Curriculum knowledge of concepts and units need to be shared across the staff ensuring that we have a common understanding of the levels of the curriculum, where our expectations for student learning are and where the students are currently achieving at.

\* We need to ensure the concepts taught are relevant to the students in terms of their learning needs and abilities. Extension activities should be offered to the group that they are targeted for whilst the other students learning is consolidation, at the appropriate level, to ensure success for all.

\* Targeted purchases of equipment, resources, experiences and time need to be made in relation to specific teaching intentions. With this unit we used the Science and Literacy budgets to subsidise the costs of the trips and the ‘experts’ for our families, so that this valuable learning was accessible to all our students.

\* Teaching focus is to be "hands on" learning as much as possible. This was very much the case during this unit. The learning was very interactive and contributed to the high levels of student engagement and success.

\* Continue our valuable home/school partnership by including home activities and informing the parents of the specific science focus, this occurred throughout the unit and beyond into our learning plans for each student. This is a powerful model of interactive education between home and school which leads to rich learning. This link was also enhanced through parent support in accompanying us on our trips and then home learning research and discussions.

\* Continue to support E.S.O.L. students through support programming with our E.S.O.L. teacher. Use a variety of assessment procedures and "hands on" learning to enhance/gauge their understandings of scientific processes.

 Prior vocabulary learnings helped to increase the understanding of our E.S.O.L. students.

**This document on student achievement in Science - Term 1 2017 was reported to the Board of Trustees Meeting on 25 May 2017.**

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

**Anne Fraser**

**(Deputy Principal)**