

# Evans Bay Intermediate School

## SCHOOLWIDE ACHIEVEMENT REPORT

IN

SCIENCE

28 November 2009

### INTRODUCTION

This report provides a picture of student achievement across the school in Science.

The report focuses on the schoolwide assessment from the Science Unit entitled *Forces and Motion*. The Forces and Motion Unit was taught during Term 3 of 2009. It was taught within each syndicate as a part of the school's rotation programme.

The unit was based on *The Physical World* Strand from the New Zealand Curriculum. The Achievement Objective used to assess the unit came from Level 3 and 4 of the Curriculum and required students to: *Explore, describe, and represent patterns and trends for everyday examples of physical phenomena, such as movement, forces, electricity and magnetism, light, sound, waves, and heat.* **It is important to note that the Achievement Objectives for Level 3 and 4 of this strand are identical.** Therefore, students were assessed as being at Level 2, Level 3/4 or Level 5.

The Achievement Objective was broken down into several separate Learning Intentions including an Overall Learning Intention for the unit. The Key Competencies selected for the unit were: *Thinking – Thinking critically about what forces are acting on given objects and how these forces are making the objects behave. Thinking reflectively when writing up conclusions from experiences. Using problem solving to work out how to improve their egg bungy or to enhance the range of a mangonel. Relating to Others – Working co-operatively with others when setting up and conducting the hands on experiments.*

The Forces and Motion Unit contained six sessions and focused on aspects of physics using common, 'everyday' objects. Students learnt about levers, friction, pulleys, cogs and gears. All sessions included practical, 'hands on' activities. These activities took the form of practical experiments. The practical aspect proved to be very popular with students. The students made pull-o-metres to measure and egg bungies but the most popular activity was when each student made a mangonel (catapult).

Where time allowed, students were often required to write up their hypotheses, results, conclusions and applications when they conducted experiments. Science classes were always in the Science Lab. Below is an overview of the sessions taken from the unit.

## Forces and Motion

<b>Session</b>	<b>Focus</b>	<b>Learning Intentions</b>
1	Diagnostic Assessment/ Levers	<ul style="list-style-type: none"><li>• Examine the relationship between the length of a lever, the amount of force applied, the mass of the load and the ease of movement.</li></ul>
2	Levers	<ul style="list-style-type: none"><li>• Investigate and explain how force acts on an object.</li><li>• Use information gathered from pull-o-meter to construct a bungy for an egg.</li></ul>
3	Gears, Cogs and pulleys	<ul style="list-style-type: none"><li>• Investigate and offer explanations of how selected items for technology function and enhance everyday activities of people.</li></ul>
4	Gears and Cogs	<ul style="list-style-type: none"><li>• Investigate and offer explanations of how selected items for technology function and enhance everyday activities of people.</li></ul>
5	Mangonel	<ul style="list-style-type: none"><li>• Investigate and explain how force acts on an object.</li><li>• Use equipment appropriately.</li></ul>
6	Summative Assessment/ Fair Test on Mangonels	<ul style="list-style-type: none"><li>• Design and carry out a fair test.</li><li>• Use equipment appropriately.</li><li>• Record information.</li></ul>

## DATA GATHERED

The unit on Force and Motion was assessed using a diagnostic/summative test assessment. That is where the diagnostic/summative assessment is exactly the same test given at the beginning and end of the unit. (See attachment).

The diagnostic/summative assessment for the unit was based on the Achievement Objective and required students to: *Explore, describe, and represent patterns and trends for everyday examples of physical phenomena, such as movement, forces, electricity and magnetism, light, sound, waves, and heat.*

The diagnostic/summative assessment consisted of tasks at various Levels from the Assessment Resource Bank (ARB). Teachers were given assessment criteria to use to determine what level a student was working at. Working levels were established at the beginning and the end of the unit using the criteria.

It is important to note the original assessment criteria did not work very well as it required students to get Question 1 (which the ARBs rated at Level 3) all correct before they could be working above Level 2. This skewed results as many students did not get this question completely correct. Under these criteria most students were working at Level 2 and it was possible for a student to score 94% and still only be working on Level 2.

In response to this anomaly, a new assessment criteria was designed and **all the diagnostic and summative information for every student was re-assessed using this new criteria.** The new criteria gave a more accurate picture of student achievement in Science with the majority of students working at Level 3/4.

Assessment criteria in Science will be drafted and trial tested a lot more vigorously next year to ensure that the results from students are assessed in a manner that makes them fair and valid. One suggestion for achieving this is to get a small number of students of mixed abilities to do the assessment and then to mark the assessment using the draft criteria to see if it is fair.

# DATA ANALYSIS

## Whole School

18.5% (70) of students are working at Level 2

**73.2% (277) of the students are working at Level 3/4**

8.2% (31) of the students are working at Level 5

## Year 8 Students

16% of Year 8s (32 students) are working at Level 2.

**72% of Year 8s (144 students) are working at Level 3/4.**

11% of Year 8s (22 students) are working at Level 5.

## Year 7 Students

21% of Year 7s (38 students) are working at Level 2.

**73% of Year 7s (133 students) are working at Level 3/4.**

5% of Year 7s (9 students) are working at Level 5.

## Year 8 Boys

16% of Year 8 boys (18 students) are working at Level 2.

**69% of Year 8 boys (74 students) are working at Level 3/4.**

13% of Year 8 boys (14 students) are working at Level 5.

## Year 8 Girls

15% of Year 8 girls (14 students) are working at Level 2.

**76% of Year 8 girls (70 students) are working at Level 3/4.**

8% of Year 8 girls (8 students) are working at Level 5.

## Year 7 Boys

18% Year 7 boys (18 students) are working at Level 2.

**77% Year 7 boys (74 students) are working at Level 3/4.**

4% Year 7 boys (4 students) are working at Level 5.

## Year 7 Girls

23% Year 7 girls (20 students) are working at Level 2.

**70% Year 7 girls (59 students) are working at Level 3/4.**

5% Year 7 girls (5 students) are working at Level 5.

## Pasifika – Year 8

26% of Pasifika (9 students) are working at Level 3/4 or 4 in Year 7.

**73% of Pasifika (25 students) are working at Level 3/4 or 4 in Year 8.**

There are no Pasifika students in Year 8 working at Level 5.

## Pasifika – Year 7

32% of Pasifika (9 students) are working at Level 2 in Year 7.

**67% of Pasifika (19 students) are working at Level 3/4 in Year 7.**

There are no Pasifika students in Year 7 working at Level 5.

### Maori – Year 8

28% of Maori (10 students) are working at Level 2 in Year 8.

**60% of Maori (21 students) are working at Level 3/4 in Year 8.**

11% of Maori (4 students) are working at Level 5 in Year 8.

### Maori – Year 7

36% of Maori (9 students) are working at Level 3/4 in Year 7.

**60% of Maori (15 students) are working at Level 3/4 in Year 7.**

(4%) 1 Maori student was working at Level 5 in Year 7

## STRENGTHS

- Interventions from this year to raise the achievement levels of Maori and Pasifika students have had a positive impact. Maori and Pasifika students' achievement in Science has improved from last year.
  - In 2008 Pasifika and Maori under performed in both year groups compared to their peers. In Year 7 only 8% of Maori and 11% of Pasifika achieved a Level 4 compared to 19% of all Year 7s. In Year 8 only 14% of Maori and 8% of Pasifika achieved a Level 4 compared to 27% of all Year 8s.
  - **In 2009 60% of Maori and 67% of Pasifika Year 7 students are working at Level 3/4 compared to 73% of all Year 7s. 60% of Year 8 Maori students are working at Level 3/4.**
- Year 8 Pasifika have the same proportion of students working at Level 3/4 (73%) as other Year 8 students (72%).
- The majority of students (73.4%) are working at Level 3/4. This demonstrates that most students are working at the level expected for this age group.
- Year 8 students performed slightly better than Year 7 students as would be expected.
- Year 8 girls were overall the best performing group but their performance compared to other groups is marginal.
- Year 8 boys are the group with the most students working at Level 5 (13%).
- There is very little difference in student achievement between boys and girls this year. In 2008 girls out performed the boys. The results from 2009 suggest student achievement for boys has improved.

## TARGETS

- Pasifika and Maori continue to under perform in both year groups compared to their peers. In Year 7 only 60% of Maori and 67% of Year 7 Pasifika are working at Level 3/4 compared to 72% of all Year 7s. In Year 8, again, only 60% of Maori are working at Level 3/4 compared to 73% of all Year 8s.
- Of particular concern was the absence of any Year 7 or 8 Pasifika students working at Level 5.

### **What will teachers do to support these learners in the future?**

- Continue to incorporate Te Reo into Science units.
- Introduce Samoan into Science where possible.
- Continue to include as many hands on activities as possible.
- Make teachers more aware of grouping more able students with less able students to help support them during activities.
- Make teachers more aware of learning styles that suit Pasifika students.
- Teachers to customise planning to cater for the needs of a particular class they are taking.

## CONCLUSION

Quality learning is happening in the area of Science at Evans Bay Intermediate School. Science has had a high profile in the school this year with the School Science Fair and the NIWA Science. 19 EBIS students represented our school at NIWA and seven students won 9 awards (Spencer Stevens and Elizabeth Cross won two prizes each).

Students are engaged in the programmes and majority of students in the school are achieving at the expected level for their age group. Units include lots of practical and hands on activities, and introduce important concepts such as 'fair testing' and how to write an investigative plan. Students continue to enjoy working in our refurbished Science Lab.

This report identified that there has been pleasing improvement in the levels of achievement for Pasifika and Maori students in Science between 2008 and 2009. However, levels of achievement for Pasifika and Maori students in Science continue to below the achievement levels of other students. These groups will continue to be carefully considered when planning future programmes in Science.

The next report on Science will be in Term 3 of 2010 to assess whether or not our interventions have made a difference to the achievement of boys, Maori and Pasifika.

This report was compiled on 28<sup>th</sup> November 2009.  
By Ben Gittos, Curriculum leader in Science.