**National Reports**

The two documents listed below are the beginning of a series of reports about New Zealand's participation in TIMSS 2006/07:

1. **Trends in Year 5 Mathematics Achievement 1994 to 2006**
   - Authors: Robyn Caygill and Sarah Kirkham
   - This report describes the mathematics and science achievement of Year 5 students in TIMSS 2006/07. Trends in New Zealand's achievement over the 12 years from 1994 to 2006 are examined, along with comparisons with other countries. Analyses of achievement by sub-groupings (such as gender and ethnicity) and background information are also presented.

2. **Trends in Year 5 Science Achievement 1994 to 2006**
   - Authors: Robyn Caygill and Sarah Kirkham
   - This report describes the mathematics and science education policies and practices in that country.

**International Reports**

- **International findings for mathematics** (Mullis, Martin, & Foy, 2008) and science (Martin, Mullis & Foy, 2008) for TIMSS 2006/07 have been published by the IEA and are available from IEA http://www.iea.nl/ and TIMSS & PIRLS Study Centre http://timss.bc.edu/.

- **TIMSS 2007 technical report** (Shaw, Martin, &的时代, 2008) contains a detailed account of the procedures for scoring translations of materials, sampling, survey operations, quality assurance, sampling weights, item analysis, scaling, and reporting.

- **TIMSS 2007 user guide for the international database** (to be published in early 2009) contains information on how to analyse the data.

- **TIMSS also published the TIMSS 2007 encyclopedia, a guide to mathematics and science education around the world** (Mullis, Martin, & Berger, 2008) in order to provide a context within which the TIMSS results can be interpreted.

**List of countries in TIMSS 2006/07 who tested at the Grade 4 (Year 5) level**

- Australia
- Austria
- Belgium (coll. of Flanders)
- British Columbia, Canada
- British Columbia, Canada
- Bulgaria
- Canada
- China Hong Kong SAR
- China Mainland
- Chile
- Colombia
- Denmark
- El Salvador
- Estonia
- Finland
- France
- Georgia
- Germany
- Greece
- Hong Kong SAR
- Hungary
- India
- Indonesia
- Japan
- Kazakhstan
- Korea (South)
- Korea (North)
- Latvia
- Lithuania
- Luxembourg
- Malaysia
- Mexico
- Netherlands
- New Zealand
- Norway
- Ontario, Canada
- Ontario, Canada
- Peru
- Portugal
- Quebec, Canada
- Romania
- Russia (Federation)
- Singapore
- Slovenia
- Slovak Republic
- Spain
- Sweden
- Switzerland
- Tajikistan
- Taiwan
- Thailand
- Ukraine
- United Arab Emirates
- United Kingdom
- United States
- Uruguay
- Vietnam
- Yemen
- Young

**key findings**

**Trends in Year 5 Achievement 1994 to 2006**

Key findings from New Zealand's participation in the Trends in International Mathematics and Science Study (TIMSS)
What is TIMSS?
The Trends in International Mathematics and Science Study (TIMSS) measures trends in mathematics and science achievement at the fourth and eighth grades (years 4 and 8) as well as monitoring various aspects of improvement and identifying the cross-curricular instructional practices from around the world. Conducted on a regular four-year cycle, TIMSS has assessed mathematics and science (1995/96, 2000/01, and 2006/07) with planning underway for 2010/11. In TIMSS 2006/07, New Zealand participated at the Year 5 level only, approximately 650 students in all five subjects around the world took part in this cycle. If they are at the middle primary level (Year 5) level for the rest of this summary.

How was TIMSS developed?
A consortium of participating countries provided voluntary participation with representatives from participating countries. The consortium was responsible for developing procedures and managing the international activities required for the project. The consortium comprised:
- International Study Center
- IEA Secretariat
- IEA’s Institute for Educational Development
- Statistics Canada
- IEA’s Institute for Educational Policy

TIMSS procedures are designed to ensure the reliability, validity, and comparability of the data through standardized procedures, and to achieve a high level of test-retest correlation, detailed manuals covering procedures, rigorous training for all involved, and monitoring of implementation to help maintain the quality of TIMSS.

Why participate in TIMSS?
Although it is often assumed that the international studies such as TIMSS are international benchmarking purposes, the main reason for TIMSS is its ability to provide a richer picture of mathematics and science achievement worldwide than the New Zealand study ever could. The TIMSS assessments are organized around two dimensions: a common dimension specifying the domain or subject matter to be assessed within mathematics and science; and a common dimension specifying the domains or subject matter to be assessed within mathematics and science. The common dimension for mathematics and science is: number; geometric shapes and measures; and a common dimension for science are life science, physical science, and earth science. For both subjects, the assessment involved the presentation and application of knowledge, understanding, and reasoning. Details of these domains are published in the TIMSS Subject Matter Frameworks (1990, 1996, 2000, 2007). The presentation of New Zealand students’ performance was the subject matter framework. The mathematics and science frameworks are: life science; physical science; and earth science. For both subjects, the assessment involved the presentation and application of knowledge, understanding, and reasoning. Details of these domains are published in the TIMSS Subject Matter Frameworks (1990, 1996, 2000, 2007). The presentation of New Zealand students’ performance was the subject matter framework. The mathematics and science frameworks

Mathematics achievement and attitudes of girls and boys
There were no differences between mean mathematics achievement of boys and girls in TIMSS 2006/07. Both boys and girls had similar significant improvements since 1995. About the same proportions of Year 5 girls and boys were positive about mathematics, whereas boys rated maths and girls in New Zealand expressed a high level of confidence in mathematics.

Science achievement and attitudes of girls and boys
There were no gender differences in science achievement between New Zealand Year 5 girls and boys, and girls and boys had similar positive attitudes to science. Both genders expressed very high levels of enjoyment and motivation, and of self-confidence.

Testing in science achievement 1994–2006
The mean science achievement at New Zealand’s Year 5 level was significantly higher than in 13 of the 36 countries that participated at the middle primary level. It compares with the other countries that have taken part in TIMSS across all three cycles. New Zealand’s mean science achievement in TIMSS 2006/07 had trended little in relation with other participating countries that participated in TIMSS 2006/07 at the middle primary level.

Cautionary notes
- Students from low socio-economic backgrounds, using the proxy measures, had the lowest probability of succeeding at the highest levels. The range of New Zealand Year 5 science achievement in 2006 was much wider than in 1994, with fewer students demonstrating very high or very low achievement.
- Students from low socio-economic backgrounds, using the proxy measures, had the lowest probability of succeeding at the highest levels. The range of New Zealand Year 5 science achievement in 2006 was much wider than in 1994, with fewer students demonstrating very high or very low achievement.

Science achievement and attitudes of students by ethnicity
Both high and low performance were found in all the ethnic groupings. Māori and Pākehā/European students demonstrated significantly higher mean mathematics scores than Māori and Pākehā students. Asian students performed significantly higher than their Pākehā/European counterparts. Māori students performed significantly lower than their Pākehā/European and Asian students. Māori students had significantly higher mean science achievement than their Pākehā/European and Asian students. More Pākehā/European students and students in the Other ethnic groupings achieved higher mean science achievement than compared with Māori, and Pasifika students. Furthermore, more students in the Other ethnic groupings reported positive attitudes towards science compared with Pākehā/European, Asian, and Māori students.

Science achievement by student’s home background
Science achievement was higher, on average, among students who regularly spent English at home. Students who were born in New Zealand had higher mathematics achievement, on average, than those who were not. Students from higher socio-economic backgrounds, using the proxy measures, had the highest probability of achieving very high levels of science achievement. In addition, the degree of their school attended, indicative of the level of economic disadvantage in the community of which their school was partially related to science achievement.

Science achievement and attitudes of students by ethnicity
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