

Student Assessment Tool

For the purposes of this study we assessed students' achievement in mathematics, reading and writing using asTTle. asTTle is an educational software package developed for the Ministry of Education by the University of Auckland which enables teachers to create and analyse literacy and numeracy tests, in both English and Māori, for students in Years 4–12 (curriculum levels 2 to 6).¹² In this chapter we discuss why we used asTTle and look at the composition of the mathematics, reading and writing tests.

Why we used asTTle

asTTle enabled us to measure changes in students' achievement over time.

One of the main reasons we chose asTTle as the assessment tool for the Transition Study was that it enabled us to measure changes in students' achievement in mathematics, reading and writing over the four phases of the study. This tool has been developed using item response modelling which enables students' scores to be compared on a common scale irrespective of which test items students actually answered and regardless of the time at which the tests were undertaken. asTTle also enabled us to design tests that were tailored to the specific needs of the students in the study and which were fairly easy to administer and score.

In addition, the transition literature indicates there is little consistency across schools in terms of standardised assessment measures, making it difficult to make valid comparisons of student achievement.

Many secondary schools prefer to administer their own entry assessment tests for prospective Year 9 students. asTTle provided us with a standard measure across all the schools in our sample.

Ensuring consistency over time

To ensure that the students' tests were consistent over time, the dimensions of the tests, in terms of the curriculum content being tested, were kept relatively the same for each phase. All the tests were designed, scored and the data entered according to the standardised asTTle procedures, by the same practitioner. An experienced teacher and asTTle user was contracted to complete this work for us. A sample of the writing tests was also verified by an independent contractor at each phase to ensure consistency in the marking of these tests. Furthermore, the content of the tests was reviewed before beginning each phase.

The composition of the asTTle tests

As mentioned earlier, one of the advantages of using asTTle was that it enabled us to design tests that were tailored to the specific needs of the students in our sample.

When creating the tests for each subject area we were able to specify the curriculum levels to be tested and the proportion of items required (selecting from most, many, some, few or very few/none) for up to three adjacent curriculum levels. For example, in Exhibit 1, *some* mathematics items have been selected for Levels 4 and 5, with *most* being chosen from Level 6.

The tests generated for Phase 1 of the study, when the students were at the end of their Year 8 year, consisted mostly of items between Levels 2 and 4 of the curriculum and, with the exception of mathematics, the curriculum levels being tested remained similar for the subsequent phases. The difficulty of the tests, however, was increased for

Assessment Tools for Teaching and Learning He Pūnaha Aromatawai mā te Whākaako me te Ako							
asTTle							
WRITING							
First Name <input type="text"/>							
Last Name <input type="text"/>							
School Name <input type="text"/>							
Room Number / Class <input type="text"/>							
For teacher use only							
Objectives	Audience	Content	Structure	Language Resources	Grammar	Punctuation	Spelling
Level 4-5-6							

¹² The asTTle package has been available free of charge to all New Zealand schools since February 2003; however, it is up to individual schools whether they choose to order and use this assessment tool. Further information on asTTle is available on www.asTTle.org.nz

Exhibit 1: Curriculum level selection

each phase by including greater numbers of items from Levels 3 and 4 and fewer items from Level 2. A handful of items from curriculum Levels 5 and 6 were also included in the latter phases.

During Phase 1, around 40 percent of the participating students found the mathematics test items too easy and in subsequent phases these students were tested using mostly items between curriculum Levels 3 and 5.

As well as being able to select the curriculum levels, we were also able to select the main content areas in mathematics and reading to be tested, using the same selection scale as the one used for the curriculum levels (i.e. most, many, some, few or very few/none).

Content areas tested for mathematics

In mathematics, tests can be designed to assess students in eight content areas:

- number knowledge;
- algebra;
- geometric operations;
- number operations;
- measurement;
- probability; and
- statistics.

When designing a mathematics test, one to three content areas are selected. For this study, students were consistently assessed in geometric operations, number operations and measurement.

An example of one of the test items used in Phase 2 is shown in Exhibit 2.

Content areas tested for reading

The test items for reading can be chosen from six content areas:

- finding information;
- understanding;
- inference;
- knowledge;
- making connections; and
- surface features (grammar, punctuation and spelling).

Our students were primarily tested in the areas of finding information, understanding, and inference, with much smaller numbers of test items from the content areas of knowledge, making connections and surface features.

Exhibit 3 provides an example of one of the reading passages and the associated questions students were asked to complete in Phase 2.

Content areas tested for writing

The asTTle writing assessments can be created to assess students' ability in either poetic or transactional writing. For poetic writing students may be asked to recount a personal life experience (recount) or tell a creative or imaginary story (narrate). Alternatively, students may be asked to explore one of the following writing concepts to assess their skills in transactional writing:

- persuading or arguing (persuade);
- instructing (instruct);
- describing or reporting (describe);
- explaining (explain); and
- analysing (analyse).

For each phase of the study, students were asked to complete a writing task based on telling a creative or imaginary story (narrate). An example of the writing task students were asked to complete during Phase 4 of the study is provided in Exhibit 4.

Exhibit 2: An example of one of the mathematical tasks students were asked to complete in Phase 2

Use the table to answer questions 15 to 16.

The table shows the number of people living in New Zealand's main urban regions in 1996.

REGION	POPULATION
Auckland	991 797
Christchurch	325 251
Dunedin	110 802
Hamilton	158 046
Hastings	58 494
Napier	52 953
Palmerston North	73 860
Rotorua	54 297
Tauranga	82 287
Wellington	334 050

15. The total population in the three smallest regions is closest to which one of these figures?

- 107 000
- 166 000
- 471 000
- 1 651 000

16. How many more people live in Auckland than in Christchurch and Wellington combined?

Exhibit 3: An example of one of the reading tasks students were asked to complete in Phase 2

Read *Savages and Thieves*, from Judith Wright's story *Holidays*, to answer questions 5 to 9.

SAVAGES AND THIEVES

Toby ran down the steep, guttered road from the shop, half-blind with tears. He was crying so much that he caught his foot in a root that ran out into the road from Ferguson's fig-tree and **barked** a knee and his chin on the hot gravel. As it was impossible for him to cry louder than he had been, he now fell silent, and limping home, only sobbed. But the tears fell in a flood.

Eleanor and John were pulling pickets off the cottage-fence behind the coral-tree, when he came through the back gate. They wanted a secret entrance to foil the plots of Savage's Gang, who had waited for them yesterday evening in the dark and caught them coming home from Long Beach, pelting them disagreeably with pieces of dead crab. Eleanor was just going to ask Toby whether he had eaten all his chocolate frog when she noticed that his heart was broken; as always at the sight of his dreadful babyish tears, her blood sprang up in rage against the world.

"What's happened, Toby? What is it?"

"They took it," Toby at last managed to articulate.

"They took your frog? Who did?" But Eleanor knew already; and meeting John's eye she took out her handkerchief and tried to repair Toby's face, which as John said was all slobbered up.

"You should have hit them," John told Toby, quite meaninglessly, since Toby at five was scarcely to be considered a match for Savage's Gang, whose four members were all over the age of nine. What John meant, however, as Eleanor understood, was really that John himself at eight, was not a match for them either, and felt himself and Toby inferior beings.

"And there ought to have been a penny change," John continued. "Have you got that?"

"They took it," wept Toby.

"Then they're thieves," Eleanor said. To take chocolate frogs was one thing; pennies, as they had all been taught, were quite another. "Savages and thieves. Now," she went on, casting about for some way to change Toby's expression, which, like the look of a rabbit she had once wickedly released from a trap, made her feel quite powerless with misery, "come inside and I'll give you a wash. And a lump of sugar. Auntie's asleep in the front garden."

"Don't want any sugar," Toby, rejecting all kindnesses, staggered alone to the steps and crawled up them on all fours, to emphasize his feelings. Unwashed, he vanished under his bed where he would lie, Eleanor expected, till lunch-time.

Exhibit 3: continued...

5. What is the main reason that the writer compares the look on Toby's face to a rabbit that Eleanor had once wickedly released from a trap.

- to make a joke about Toby's situation
- to make us feel that Toby is small and helpless
- to let us know that Eleanor is kind to animals
- to let us know that Toby is a silly boy

6. Which word would best replace the word "barked" in paragraph one?

- skinned
- bounced
- growled
- rubbed

7. What does the first paragraph mainly describe?

- what Toby's street looks like
- the Savage Gang's attack on Toby
- Toby's journey back from the shop
- Eleanor and John in the garden

8. What does the space under the bed offer Toby?

9. Write a phrase from the text that tells us that Eleanor feels protective of Toby

Exhibit 4: The writing task students were asked to complete during Phase 4 of the study



A Grandfather or Grandmother's Story

Imagine you are a grandmother or grandfather sharing a childhood memory. Write an **imaginative story** about something that happened to you when you were young. Don't be limited by your own experiences. Write the story so that your imagined teenage grandchild or mokopuna will enjoy reading it.

Hints

- Plan your story before you write.
- Include an interesting title for your story.
- Write a beginning which attracts attention and an ending which is satisfying for the reader.
- Use an interesting and logical structure in which story elements are introduced and developed.
- Use descriptive words and images so the reader can imagine the characters and places in your story.
- Make use of the time at the end of the task to edit your writing, paying attention to grammar, punctuation and spelling.



Students' attitudes towards mathematics, reading and writing as measured by asTTle

Research indicates there is a decline in students' attitudes towards particular subjects as they progress through school.

In addition to assessing students' achievement in mathematics, reading, and writing, asTTle enabled us to measure students' attitudes towards those subjects and to monitor how their views towards them changed over time.

Before beginning each asTTle assessment students were asked to complete six attitude questions (as well as brief details about themselves: gender, year level at school, ethnicity, and how often they speak English at home). The six attitude items were developed by the National Education Monitoring Project (NEMP)¹³.

Three of the attitudinal questions in the mathematics and reading assessments and two questions in the writing assessment were designed to find out how much the student *liked* the particular subject. A further three questions in mathematics and reading and four questions in writing asked how *good* students felt they were in these subjects, and whether they thought their teachers and parents or caregivers thought they were *good* at it. The aim of these questions was to determine how confident students were of their ability in a particular subject, as well as how they thought others viewed their ability.

Students indicated how they felt about a subject by choosing one of four faces, ranging from a very unhappy face through to a very happy face, for

each of the six questions, as shown in Exhibit 5. The students' answers were then averaged to indicate their overall preference for a particular subject.





Students' preparation for the asTTle tests

Students were advised when each test session would occur either during their individual interview with one of the researchers, if they were interviewed prior to a test session happening, or through the school notices read out during form time. Our aim was to test all the students at the same time in order to minimise the disruption to their class programmes. The scheduled test times, however, did not always suit all students so, in order to obtain assessment data from as many students as possible, make-up sessions were arranged for those students who had been sick, had other commitments or had just forgotten to turn up at the allocated time. Sometimes a number of make-up sessions needed to be organised.

Despite our best efforts to test all the students involved in the study there were a few students for whom we were unable to achieve a full set of assessments.

The analyses of the asTTle test results, reported on in the following chapters, are based on the results from students who completed reading (N=87), writing (N=77) and mathematics (N=85) assessments at each phase of the study.

Exhibit 5: Attitude questions for reading

Tick the box that is closest to how you feel about each question	1 	2 	3 	4 
A1. How much do you like reading at school?				
A2. How good do you think you are at reading?				
A3. How good does your teacher think you are at reading?				
A4. How good does your Mum or Dad think you are at reading?				
A5. How much do you like reading in your own time (not at school)?				
A6. How do you feel about going to a library to get something to read?				

¹³ Further details are available on www.asttle.org.nz