

NAPLAN

2018 State report – Year 3

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Government



Queensland Curriculum
& Assessment Authority

For all Queensland schools

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Queensland Curriculum & Assessment Authority
PO Box 307 Spring Hill QLD 4004 Australia
154 Melbourne Street, South Brisbane

Phone: (07) 3864 0299

Email: office@qcaa.qld.edu.au

Website: www.qcaa.qld.edu.au

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Preface

State reports are issued by the QCAA about the performance of Queensland students on the National Assessment Program — Literacy and Numeracy (NAPLAN) paper tests. State reports provide system-level information and are publicly available. This report for Year 3 students in 2018 contains:

- the Queensland performance on each item
- the national performance on each item
- the item descriptors
- a commentary on the state results
- some recommendations for teaching.

Who should use this State report?

The NAPLAN State reports help principals, teachers and other school personnel understand, interpret and use information about student performance on NAPLAN.

School principals can use this report to provide information to the school community on aspects of the tests. This would allow professional conversations with their teachers, curriculum leaders, and department heads. Curriculum leaders can use this information to interpret the more specific information given in their school and class reports. These other reports are explained below.

Since this report is publicly available on the QCAA website, it can also inform providers of teacher training, special education services and educational research and policy.

Parents and carers can use this report to interpret the results on their child's student report. They are also able to judge how their child performed when compared with the whole population of students. The item descriptors provide them with useful information about the scope of the tests.

About the tests

The purpose of the National Assessment Program (NAP) is to collect information that governments, education authorities and schools can use to identify indicative literacy and numeracy skills Australian students can demonstrate. As part of that program, the NAPLAN tests are administered to full cohorts of students in Years 3, 5, 7 and 9 each year. These standardised tests are sources of information about student learning that can be used to inform educational policy and current educational practice.

The NAPLAN tests were initially developed using the nationally agreed Statements of Learning for English and Statements of Learning for Mathematics, 2005. Since 2016 however, the tests are referenced to the Australian Curriculum. The NAPLAN tests are designed to assess student understanding in the following areas:

- Language conventions: The test assesses the ability of students to independently recognise and use correct Standard Australian English grammar, punctuation and spelling.
- Writing: The test assesses the ability of students to convey thoughts, ideas and information through the independent construction of a written text in Standard Australian English.
- Reading: The test assesses the ability of students to independently make meaning from written Standard Australian English texts, including those with some visual elements.

- **Numeracy:** The test assesses students' knowledge of mathematics, their ability to apply that knowledge in context independently, and their ability to reason mathematically.

Marking and scoring the tests

Marking the tests

Markers mark those test items that do not use a multiple-choice format. These markers apply nationally agreed marking guides. There are marking guides for open-ended Reading items if any such items are included. Marking guides allow consistent and reliable judgments by markers. There are guides for the Writing test and one each for the constructed responses in Numeracy and Spelling. For some Numeracy items, students may provide a correct response in different forms. Professional officers decide on agreed scoring protocols for these items.

Calculating raw scores

The simplest calculation made in scoring the tests is the raw score — the number of questions answered correctly. All of the questions for the Language conventions, Reading and Numeracy tests are marked as either correct or incorrect. Raw scores for the Writing test are sums of the marks on each of ten criteria.

Raw scores have limited use. They enable the performance of students who have all completed the same test at the same time to be placed in a rank order, but they do not provide information about the level of difficulty of the test nor the relative differences between students.

Constructing scaled scores and bands

To make raw scores more useful, they are transferred to scores on a common scale that reflects how difficult it was to achieve each score. Each year ACARA publishes equivalence tables that allow a student's raw score to be located on the NAPLAN scale. The scale is comparable between year levels for each assessment area. An equating process is also carried out on each year's test to enable scores to be compared between successive years of testing. For example, a raw score of 20 on the Year 3 Reading test might be transformed to a scaled score of 354. This will also represent the same achievement for a student with the same scaled score in Year 5, and for a student with the same scaled score for Reading in a previous year.

Each NAPLAN scale is divided into ten bands used to report student progress.

Using NAPLAN reports to inform teaching and learning

Using scaled scores

The scaled score can compare the results of different students. Scaled scores provide a basis for measuring and comparing students' abilities across years of schooling, for example, comparing a student's result in Year 3 in 2016 and Year 5 in 2018. The scales can thus help to monitor the growth of groups of students over time. This enables the school to review and/or consolidate special programs that may have been put in place.

Principals and teachers should take care when making comparisons between small groups of students. For groups of fewer than ten students, differences may not be reliable, particularly small differences.

Using item analysis

While the national and state reports provide the comparative data, class reports provide a school with the information that can be used to inform teaching and learning and to build capacity in schools. Analysis of the NAPLAN class data, in particular the performance on each item, will

provide teachers with information about the understandings and patterns of misunderstandings of students.

Looking at the performance on the items and then analysing the error patterns allows teachers and principals to make hypotheses about why groups of students make particular errors. As mentioned below, more detailed analysis by QCAA staff is available from the QCAA website.

Steps for analysis might be as follows:

- Compare the facility rates (percentage correct) achieved by the school's students with the national and state results available in this document. Is their performance consistent?
- Look at the common errors made by their students and compare them with the common errors made in the state. Only errors from Queensland students are available and are found in the item analyses that are part of SunLANDA Online.
- Form hypotheses about why students are making these errors, e.g.
 - How did students think about this aspect of the curriculum?
 - What misunderstandings might these errors represent?
 - How might the structure of the test question have shaped the response?

Using a combination of the NAPLAN data, school data and professional judgment, teachers may then test these hypotheses to see whether they are valid or whether there is more to be thought about and investigated. Teachers can then plan lessons related to the general areas where students seem to need help. Teachers can also make judgments about teaching approaches and curriculum.

The professional conversations that are part of this process are the most effective and powerful way to use the data, as they are the vehicle for developing shared understandings.

Placing the tests in the assessment context

The results from the NAPLAN tests should be seen as only one input into a school's assessment program. Various forms of assessment are needed to inform the different stages of the teaching and learning cycle. Principals and teachers should keep in mind that NAPLAN is a point-in-time, timed test that can only cover a few curriculum features.

The results from a school's own assessments of students should be consistent with the NAPLAN test results. If the test results are different from what was expected, consider possible reasons. The results of the tests may indicate aspects of student performance that need further investigation within the classroom, using other forms of assessment.

An item with a low facility rate (percentage correct) may not necessarily indicate a problem in teaching and learning. It may be that this was simply a difficult item for all students in this cohort across Australia.

Other NAPLAN reports

In addition to the State reports, the following reports are produced about the performance of Queensland students who sit the NAPLAN paper tests:

SunLANDA Online

Since 2015, student data has been released on the QCAA School Portal using the SunLANDA Online interface. Access to SunLANDA as application software is also still available on the QCAA website.

SunLANDA Online provides class and school information in an electronic form that permits customised spreadsheet generation by users. In addition, it shows representative samples of students' incorrect responses to constructed responses where applicable. Hyperlinks from within SunLANDA Online lead to the QCAA's test item analysis. Information on how to use this service is available at: www.qcaa.qld.edu.au/p-10/naplan/test-reporting-analysis/sunlanda/accessing-navigating-sunlanda.

Test item analysis

These PDF documents contain an analysis of each test item. They can be downloaded directly from the QCAA website: <https://www.qcaa.qld.edu.au/p-10/naplan/test-reporting-analysis/test-item-analysis>. A school Brief Identification Code (BIC) and password is required to access these documents. The analysis reproduces each item followed by expert analyses of how the item operated. It shows the distractors presented in multiple-choice items and explains students' reasoning.

School and class reports

The NAPLAN school and class reports are supplied electronically on the secure section of the QCAA website. These reports are accessible only with the school's Brief Identification Code (BIC) login and password. Individual student reports are distributed to schools as printed copies.

School reports

The QCAA issues NAPLAN school reports giving information about each school's performance. They provide a summary of year-level performance as well as performance by gender, language background and Indigenous status in the following fields:

- distribution of scaled scores
- distribution of achievement bands
- school and state means
- participation of the group.

The school report positions a school's performance within the state on a graph that is shaded to show the range of performance for the middle 60% of Queensland students together with the state mean.

Class reports

The QCAA issues NAPLAN class reports that show the performance of every student on every item. Under the name of each student is recorded the items they had correct and incorrect. They also show students' responses to constructed-response items.

The class report also gives the:

- percentage correct for each item for the class and state, and by gender

- scaled scores for each student
- performance bands for each student.

Individual student reports

The QCAA issues individual student reports to schools after the tests. Schools receive one printed report for each student to distribute to parents/carers.

ACARA reports

As well as the Queensland reports from the QCAA, national reports are available from the website of the Australian Curriculum Assessment and Reporting Authority (ACARA). The *NAPLAN National Summary Report* and the *NAPLAN National Report* allow states and territories to place the achievement of their students in relation to their peers across the nation. This is system-level information and is publicly available.

Literacy

Writing

Stimulus (writing prompt) Years 3 & 5

YEAR 3 AND YEAR 5

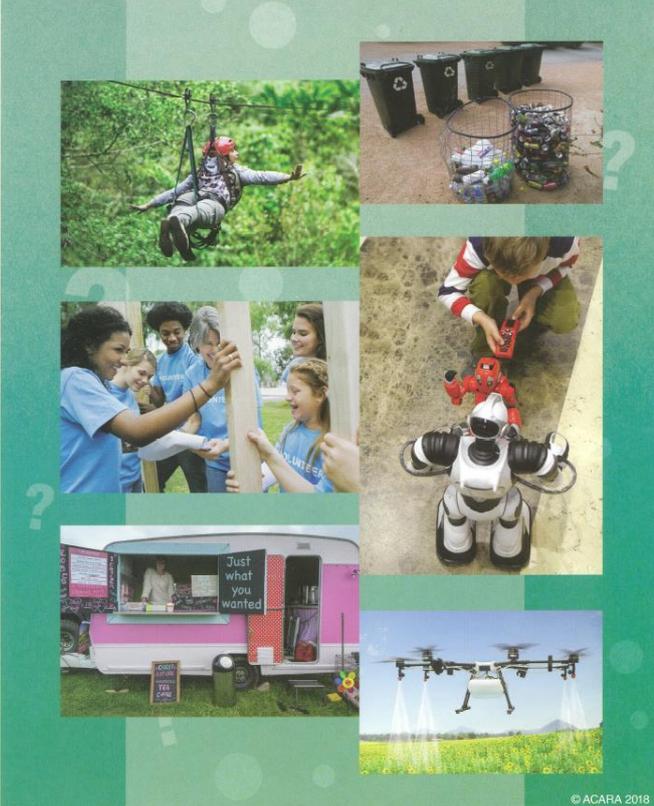
My big idea!

Write a persuasive text about an idea that would improve your classroom, school or community. Give reasons why it is a good idea by explaining how it might be useful and what its benefits are. You can use your own idea or you can use an idea on this page.

- **Start with an introduction.**
An introduction lets a reader know what you are going to write about.
- **Write your opinions on the topic.**
Give reasons for your opinions. Explain your reasons.
- **Finish with a conclusion.**
A conclusion sums up your reasons so that a reader is convinced of your opinions.

Remember to:

- plan your writing
- use paragraphs to organise your ideas
- write in sentences
- choose your words carefully to convince a reader of your opinions
- pay attention to your spelling and punctuation
- check and edit your writing.



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About the task

In 2018, the NAPLAN Writing test was based on the persuasive genre. Two prompts were used, one for Years 3 & 5 and another for Years 7 & 9. The test conditions and administration remained the same as in previous years, i.e. teachers delivered the same spoken instructions and read the text aloud to students. Working independently, students had to plan, compose and edit a written response. Students were allowed five minutes to plan their script, thirty minutes to write and a further five minutes to edit and complete the task. Three pages were provided for students to write a response.

The 2018 prompt for Years 3 & 5 was titled *My big idea!* Students were asked, in the textual component of the prompt, to *Write a persuasive text about an idea that would improve your classroom, school or community.* The prompt was relatively open-ended, allowing students to *use your own idea or you can use an idea on this page.* Six photographic images were provided for the students and the majority of Year 3 students selected one of these, with a large number using the idea of rubbish and recycling rubbish to make their schools or community cleaner.

Additional information identified the structural components of a persuasive text and further defined these elements, e.g. *Start with an introduction. An introduction lets the reader know what you are going to write about.* Other notes were also provided in relation to the conventions associated with a writing task, e.g. *write in sentences, use paragraphs to organise your ideas,*

pay attention to your spelling and punctuation, check and edit your writing. If students are made aware of the information given on the prompt it will give them clear instructions about what they need to do to produce a complete persuasive text.

Markers for this Writing test were trained using the national persuasive writing marker training package, delivered as part of ACARA's national assessment program. Markers were recruited and trained in accordance with national protocols. For Queensland, registered teachers marked the NAPLAN Writing test. All markers applied the 10 criteria and related standards from the marking rubric. Writing test scripts were marked on screen in all states and territories. Stringent quality-control measures were applied to the marking of student scripts, including a prescribed percentage of scripts to be double-marked, and the daily application nationally of control scripts for all markers. As part of the Queensland marking operation for 2018, referee marking further ensured marker reliability. There was also provision for appeal over individual Writing test scores after the results were released.

A copy of the Persuasive Writing Marking Guide (2013) is available at:

www.nap.edu.au/_resources/Amended_2013_Persuasive_Writing_Marking_Guide_With_cover.pdf.

Performance

Anecdotal evidence from markers indicated that students in Years 3 and 5 were comfortable with the writing prompt, *My big idea!* The images provided were widely adopted by students as the basis for their persuasive texts, particularly the photo of different rubbish bins. Drones and robots did not appear as frequently as was anticipated with Year 3 students. A 'tour the stimulus' approach was less evident in 2018 than in some previous years. The relatively small group of students who diverged from the images provided on the prompt tended to write more challenging texts, though this was not exclusively so. A closer adherence to the suggestions provided on the stimulus page appeared to be reflective of a general appropriateness for the age levels, rather than some absence of originality of ideas.

Students continued to adopt formulaic approaches to this persuasive text type, and whilst this broadly met the demands of the task (and rubric), it restricted a more natural flow of language and ideas. So, typically, an opening statement, such as *I firmly (or strongly or even passionately) believe*, would be followed by a series of body paragraphs, often introduced by the connectives *Firstly, Secondly, Thirdly* — concluding with a paragraph that provided a brief summation of arguments and ideas presented.

Students in Year 3, and to a lesser extent in Year 5, wrote in mostly straightforward sentence forms, with complex sentences common. As far as possible, students should be encouraged to explore the full range of sentence structures, including the judicious use of short, sharp simple sentences and fragments for effect.

In terms of length of text, students in Years 3 and 5 tended to write a little more than the persuasive texts of previous years. This was encouraging. It is possible that the suitability of the prompt contributed to this trend. Obviously, students who were able to make use of a well-chosen adverb, adjective or nominal group could write with fewer words but with more demonstrable control of language.

A number of students used more varied openings to their texts to engage the reader. In some cases this was productive, e.g.

- *Do you want an even better school? I know I sure do sometimes!*
- *Globally, children must recycle and reuse.*
- *Would you want children to be sweaty and stink at school? Of course not! That's why you need to have my greatest invention! Trust me, you'll like it!*

In other cases, the introductions appeared a little contrived, and failed to match the development of ideas (and tone) in the remainder of the text. Whilst cohesion is only one of the NAPLAN Writing criteria, the ways in which ideas, vocabulary, paragraphing and sentence structure work together is important to whole-of-text integration and reader understanding. Students should be encouraged to focus on 'big' ideas and construct their texts accordingly, ensuring consistency and sincerity of message without unnecessary gimmickry.

Relative areas of improvement from 2017 included the criteria of *Audience*, *Ideas*, *Sentence Structure* and *Vocabulary*. In terms of *Audience*, students wrote with greater confidence in their ability to express their personal views and individuality. Since choice of *Ideas* was encouraged through the prompt, more students were able to draw on areas of interest and subject knowledge, e.g. rubbish, recycling and school settings.

My BIG Idea!!!

I strongly believe that "excursions should be included more frequently in the curriculum. It's time for students to see what they really want to do, what is the most joyful aspect of their school year. You know what they'll answer? Excursions, excursions galore!

For starters there are SO MUCH fun activities that school excursions to delve into. From swimming in idyllic crystal-blue pools to wandering a thick bushy nature reserve - there's no limit to this fascinating, fun world! All those activities pose opportunities for excursions! Once the students get back do you notice all they gossip about is the brilliant activity they didn't want to leave? Keep the activities are pure paradise in a perfectly unique way - but wait, there's more to excursions than activities!

Furthermore kids have a laing, symbolic connection to nature - one that can be greatly strengthened by excursions. When they embark on nature

challenges with their friends they're unstoppable and determined. Mother Nature beckons to them still. Children's curious eager hearts love to learn more about nature, even a tiny part like their favourite animal's least favourite food.

They simply clap their hands with delight when rangers give an intriguing stimulating talk about wild animals-what's more they often show the animals to them! Stunning.

Finally excursions contribute to a big part in children's happiness. It's when they can relax explore and enjoy the place to go to delight in practically EVERYTHING and totally go crazy enthusiastic when they see a fascinating spectacle.

Fun is a major part in children's development-just ask a kindergarten teacher or a plain classroom teacher!

The kids will most likely chatter on about it for ages prattling on about

Seemingly nothing-but just remember excursions make kids fantastically sparky, energetic and talkative!!

To conclude this, excursions definitely need to be popularized. There are so many benefits- I have mentioned only three because the rewards are practically endless.

The activities are miraculous, nature is at its extraordinary especially in excursions and those thrilling trips make kids ever SO HAPPY!!!

The next time you find yourself with a bag bouncing on your back lining up near a busy main street, think this- it's time to buckle up and drink in this marvellous excursion!

END OF TEST

Commentary on sample script

Many students who approached the Year 3 & 5 prompt tended to use the images provided on the prompt page as their subject matter. The student who wrote the sample script chose a more challenging idea and advocated for more school excursions:

I strongly believe that excursions should be included more frequently in the curriculum.

It is quite difficult for younger students to escape the formulaic approach to a persuasive text. After all, limitations in vocabulary, breadth of subject knowledge and familiarity with the genre restrict the capacity for students of this age to explore more original text forms. Whilst this persuasive text does follow a traditional approach to a NAPLAN demand writing task, the writer has managed to 'colour' the text with an original voice, as well as demonstrate a control over the development of their thought process about the need for more excursions.

The position in support of excursions is clearly established in the introductory paragraph, stating the topic and position taken. Following on from the introduction, the student uses three body paragraphs to persuade readers to this point of view, sharing examples of the kinds of excursions and the benefits of each.

Children's curious, eager hearts love to learn more about nature, even a tiny part like their favourite animal's least favourite food. They simply clap their hands with delight when rangers give an intriguing, scintillating talk about wild animals ...

The text finishes with a positive conclusion that invites the reader to engage with the positive benefits of excursions.

The next time you find yourself with a bag bouncing on your back, lining up near a busy main street, think this — It's time to buckle up and drink in this marvellous excursion!

This young writer has experimented with a range of persuasive techniques that do, on the whole, succeed in engaging the audience and begin to persuade. Features such as emphasis:

- *There are so many benefits (from excursions) — I have mentioned only three because the rewards are practically endless.*
- *... nature is extraordinary especially in excursions, and those thrilling trips make kids ever SO HAPPY!!!*

The vocabulary is mature and is generally contextually appropriate. There is an occasional clumsiness in construction and language choice, e.g.

- *SO MUCH fun*
- *loving, symbolic connection to nature*

but the overall strength of vocabulary use outweighed the occasional slip, e.g.

- *included more frequently in the curriculum*
- *swimming in idyllic crystal-blue pools*
- *greatly strengthened by excursions*
- *pose opportunities*
- *unstoppable and determined.*

The strength of the persuasive argument this student produced was of a high standard. The spelling, punctuation and paragraphing had a very high degree of accuracy for such a young writer. This is a very commendable effort for a Year 3 student.

Language conventions

Spelling

Results and item descriptions

The percentage columns give the facility rate (percentage correct).

Item	Answer	QLD %	Aust. %	Description
Proofreading — Error identified				
1	baby	86.41	87.71	Corrects the spelling of a two-syllable word with two long vowels.
2	joy	79.10	83.19	Corrects the spelling of a single-syllable word with oy.
3	flapping	69.28	69.59	Corrects the spelling of a two-syllable word with a doubled final consonant before -ing.
4	fast	68.97	71.99	Corrects the spelling of a single-syllable word with a complex vowel.
5	snail	49.74	52.60	Corrects the spelling of a single-syllable word with ai.
6	toothbrushes	54.52	55.11	Corrects the spelling of a three-syllable plural compound word ending in -es.
7	cents	28.07	29.90	Corrects the spelling of a single-syllable homophone starting with ce-.
8	towel	24.63	29.63	Corrects the spelling of a single-syllable word ending in -el.
9	imaginary	23.70	26.78	Corrects the spelling of a multisyllable word ending in -ary.
10	mixture	13.19	15.96	Corrects the spelling of a two-syllable word with x.
11	tripped	13.86	15.30	Corrects the spelling of a single-syllable word with a doubled consonant before -ed.
12	whether	10.37	10.47	Corrects the spelling of a two-syllable homophone starting with wh-.
Proofreading — Error not identified				
13	hit	88.34	89.41	Identifies and corrects an error in a single-syllable word ending in a vowel and consonant.
14	lean	65.53	67.22	Identifies and corrects an error in a single-syllable word with ee.
15	tonight	65.67	66.81	Identifies and corrects an error in a two-syllable word with igh.
16	butterfly	56.58	60.28	Identifies and corrects an error in a three-syllable compound word with tt.

17	shirt	49.22	50.07	Identifies and corrects an error in a single-syllable word with ir.
18	crooked	39.52	41.32	Identifies and corrects an error in a two-syllable word starting with cr-.
19	recorder	31.93	36.33	Identifies and corrects error in a three-syllable word ending in -er.
20	cancel	29.55	33.45	Identifies and corrects an error in a two-syllable word with ce.
21	delivered	31.92	34.90	Identifies and corrects an error in a three-syllable word starting with del-.
22	quality	15.16	18.26	Identifies and corrects an error in a three-syllable word ending in -ty.
23	liquid	16.03	17.78	Identifies and corrects an error in a two-syllable word ending in -id.
24	flour	9.35	10.15	Identifies and corrects an error in a single-syllable homophone ending in -our.
25	valuable	5.71	6.95	Identifies and corrects an error in a multisyllable word ending in -uable.

About the test

The 2018 Year 3 test focused on the following spelling features:

- short, long and diphthong vowels: *hit, baby, quality, joy, fast, snail, lean, shirt*
- complex consonants: *mixture, crooked, cancel*
- homophones: *cents, flour, whether* (compare with scents, flower and weather)
- inflections: *flapping, toothbrushes, tripped, recorder*
- affixes: *recorder, valuable, imaginary, delivered*
- compound words: *tonight, butterfly*
- unstressed final syllables: *towel, liquid*.

Both sets of questions in the Spelling test use proofreading formats. The target words in the first set are misspelt and identified by being circled. Those in the second set are misspelt but not identified, so students need to find them inside sentences containing other words (distractors) that are correctly spelt. These supplied misspellings may lead students to spell differently from when they write to dictation or compose their own sentences.

Performance

Compared to the national average, Year 3 students in Queensland performed only marginally lower on all words. Overall, Year 3 students performed similarly to recent years.

Very many students did not attempt to spell the target words *flour* and *valuable* because they selected distractor words instead. Students had particular difficulty spelling homophones, complex consonants, inflections and unstressed vowels. A significant percentage of students omitted a response for the words *liquid* and *valuable*. Significantly, these are examples where 'sounding-out' strategies (mapping sounds to single letters), are no longer of use.

Implications for teaching

Test-wiseness

Students should read the sentences carefully to identify the target word. When completing the second set, the 'mistake not identified' items, they should not assume that the most challenging-looking vocabulary words in the sentences will always be the misspelt target.

Beyond 'sounding-out'

Unstressed final syllables: In many two-syllable words (e.g. *towel*, *liquid*), the first syllable is heavily stressed and the second syllable is unstressed to the point that the vowel becomes neutral, like a schwa. Students need to learn that there is no way to 'sound out' a schwa. Instead, they have to know typical within-word letter patterns.

Morpheme knowledge

Morphemes are chunks of letters with grammatical meaning. These include plural inflections, tense inflections, prefixes and suffixes. We add *s* to make a plural noun or irregular present tense verb, but if the word ends with *sh*, *x*, *z*, *ch* or *s*, we add *es* (e.g. *toothbrushes*). To add *-ed* or *-ing* to a verb ending in a consonant, we double the consonant (e.g. *flapping*, *tripped*). If the verb ends with *e*, we drop the *e* (e.g. *untie/untied*).

This *e*-drop also applies when adding a suffix that starts with a vowel (e.g. *imagine/imaginary*; *value/valuable*). Although the middle vowel in *valuable* is neutral-sounding, this is not usually the case (e.g. *adorable*, *chewable*).

QCAA resources

Full analysis of student performance and error patterns for each item is published in the SunLANDA program: <https://www.qcaa.qld.edu.au/p-10/naplan/test-reporting-analysis/sunlanda/accessing-navigating-sunlanda> and as PDF documents: <https://www.qcaa.qld.edu.au/p-10/naplan/test-reporting-analysis/test-item-analysis>. A school BIC and password is required to access each year level document.

Grammar and punctuation

Results and item descriptions

The percentage columns give the facility rate (percentage correct).

Item	Answer	QLD %	Aust. %	Description
26	B	94.93	95.37	Identifies correct conjunction to join two main clauses to form a compound sentence.
27	A	94.92	95.17	Identifies the correct pronoun subject for a verb in a simple sentence.
28	C	81.19	81.55	Identifies a sentence that needs a full stop.
29	A	74.76	76.46	Identifies the correct use of the article <i>an</i> with a word starting with h-.
30	A	76.48	75.15	Identifies the correct contraction of should not.
31	B	66.64	69.53	Identifies the correct verb to ensure subject-verb agreement in four sentences.
32	B	75.95	76.52	Identifies the correct preposition for a prepositional phrase.
33	C	54.14	52.63	Identifies the verb in a simple sentence.
34	D	55.40	57.03	Identifies the reason for the use of a capital letter in a simple sentence.
35	B	48.26	49.14	Identifies a complete sentence.
36	D	52.02	53.14	Identifies the sentence boundary between two simple sentences.
37	B	53.47	53.49	Identifies that a sentence has narrative text features.
38	B	49.67	50.61	Identifies the correct punctuation of a list in a simple sentence.
39	A	52.63	53.87	Identifies that a sentence expresses an opinion.
40	C	49.77	51.53	Identifies the past tense of a present tense complex sentence.
41	E	42.63	42.19	Identifies that a sentence in a recipe is a command.
42	C	34.36	33.91	Identifies that a noun is missing from a simple sentence.
43	C	32.92	34.56	Identifies the adverb in a simple sentence.
44	D	25.91	24.43	Identifies the action verb in a simple sentence.
45	C	23.80	24.52	Identifies why indirect speech does not need quotation marks.
46	C	26.26	24.79	Identifies the reason for the use of an apostrophe in a simple sentence.

47	D	14.09	13.46	Identifies the order of events in a complex sentence.
48	D	14.29	13.19	Identifies the pronoun in a simple sentence.
49	A	20.51	20.62	Identifies the correct verbs for agreement in a compound sentence.
*50	1,2,1,1	24.46	22.75	Identifies which word with an apostrophe grammatically matches a sentence.

* Item 50. Answers in sequence: its, it's, its, its.

About the test

The NAPLAN Language conventions items test sentence-level, clause-level and word-level skills. The test does not cover the curriculum. Instead, it tells how a large number of students perform on a small range of tasks. Standardised tests can, however, suggest broad trends across a cohort. At the level of individual students, NAPLAN results can supplement classroom assessments and guide teachers to important points of grammar and punctuation that need revisiting. The Language conventions test comprises 50 items in total: 25 Spelling items and 25 Grammar and punctuation items.

The Grammar and punctuation items in the 2018 Year 3 test involved the following features:

- Cohesion: Students had to follow the causal and sequential links between ideas created by conjunctions (Item 26) and verb tense (Items 40 and 47)
- Sentence structure: Students needed to know when a full stop is required to end a sentence (Item 28) and where a full stop should demarcate sentence boundaries (Item 36). They were also required to identify subject-verb agreement (Items 31 and 49)
- Parts of speech: Students were required to identify the specific word within a sentence or clause that was: a pronoun (Items 27 and 48), a verb (Items 33, 39 and 44) a noun (Item 42) and an adverb (Item 43)
- Apostrophes: Students had to know that shouldn't, job's and it's all use apostrophes of contraction (Items 30, 46, 50)
- Commas: Students were required to identify the correct use of list commas in Item 38
- Indirect speech: Students needed to know that indirect speech does not require the use of quotation marks (Item 45)
- Articles and determiners (Item 29).

Most of these areas have been familiar components of previous Year 3 Language conventions tests.

For information about the full range of grammar knowledge that Year 3 students should have, refer to the Australian Curriculum English.

Performance

The performance of Queensland Year 3 students in Grammar and punctuation was comparable with the national cohort. Queensland student results were closer to the National average in this strand in 2018, compared with the other strands of Spelling, Reading and Numeracy that were also assessed in a multiple-choice format. Between 2008 and 2012, Queensland student results were below the National average, however this gap closed steadily over this period. In both 2013 and 2014, the difference between Queensland and National was slight. Queensland performance has mirrored the National average from 2015 to the current year's results.

The strongest results by Queensland students were achieved in Items 30, 46 and 50 (apostrophes of contraction and possession), Items 33 and 44 (identifying verbs) and Item 48 (identifying a pronoun).

The weakest results by Queensland students were in Item 31 (subject-verb agreement), Item 34 (use of capital letter for a proper noun), Item 39 (opinion / thinking verb), Item 40 (past tense) and Item 43 (identifying an adverb).

A pleasing feature of the performance of Queensland Year 3 students on this year's test was the relative strength of results in the final set of items, which tended to be the most difficult. Relative to national averages, Queensland students performed higher in 4 of the final 5 items on the test.

Implications for teaching

Grammar and punctuation is not a separate area of reading and writing, but an essential component. The contexts of language in use are pivotal to a full understanding of how syntax, grammatical and punctuation conventions operate. Wherever possible, meaning and purpose in texts should be emphasised, noting how particular language conventions contribute to making meaning.

At the Year 3 level, the systematic introduction of punctuation and the more straightforward grammatical features comprise an essential part of direct teaching practice. Teachers are encouraged to revisit the specific areas that NAPLAN targets, as they often represent fundamental conventions and usage.

Familiarity with diverse types of texts may help students to be more confident in viewing the NAPLAN items. Teachers are encouraged to guide students through notable grammar and punctuation features and usage in a wide selection of reading materials, including texts that are challenging and divergent in form.

Metalanguage

Success in the Grammar and punctuation items of the 2018 Year 3 Language conventions test relied to some extent on a degree of metalinguistic knowledge and understanding. This feature of the test has become more apparent in recent years, and is also significant in testing at Years 5, 7 and 9. This year there were a high number of items requiring metalinguistic knowledge, thirteen items, compared to eight in 2017 and six in 2016.

Terminology like *contraction* (Item 30), *verb* (Items 33 & 44), *adverb* (Items 42 and 43), *apostrophe* (Item 46), *pronoun* (Item 48) and *quotation marks* (Item 45) are now commonplace in NAPLAN Language conventions tests. The teaching of these terms is essential for many reasons other than NAPLAN success. A common language between teacher and student, student and student and even test constructor and student is an enabler for student language improvement. However, knowledge of grammatical terms, by itself, is not sufficient for students' language growth. Students can be encouraged to see language in context, to look at linguistic concepts within the frame of making meaning, and even to recognise how parts of speech can fulfil different roles. At Year 3 level, crucial foundational concepts are being established that will provide a solid foundation for success in subsequent year levels.

Test-wiseness

It is pleasing to note that the omission rates for Grammar and punctuation are noticeably lower than those for Spelling, Reading and Numeracy. Even for the more difficult items towards the end of the test, the omission rate did not exceed 8%. Students should continue to be encouraged to provide responses for all items in multiple-choice format questions when they are checking over their responses. Persistence to provide responses to all items and a systematic approach to answering and checking over answers will contribute to the omission rate remaining low in Grammar and punctuation.

Three items this year offered students five multiple-choice options, rather than the more conventional four options — Items 39, 41 and 48. Item 50 was presented in a similar format to previous years and required students to choose between two options in each of four given sentences. The increased complexity and demands in these items may influence their lower facility rates. It is important that students understand that items may be presented in unfamiliar ways and that reading questions carefully is an important component of test-wiseness.

QCAA resources

Full analysis of student performance and error patterns for each item is published in the SunLANDA program: <https://www.qcaa.qld.edu.au/p-10/naplan/test-reporting-analysis/sunlanda/accessing-navigating-sunlanda> and as PDF documents: <https://www.qcaa.qld.edu.au/p-10/naplan/test-reporting-analysis/test-item-analysis>. A school BIC and password is required to access each year level document.

Reading

Results and item descriptions

The percentage columns give the proportion of correct answers (facility rates).

Item	Answer	QLD %	Aust. %	Description
<i>The pig and the puddle</i>				
1	C	93.76	94.09	Identifies the setting of an imaginative text.
2	B	93.82	94.35	Identifies the cause of an action in an imaginative text.
3	D	93.37	93.16	Interprets visual and written cues in an imaginative text.
4	D	79.39	80.03	Interprets information in an imaginative text.
5	A	89.12	90.56	Identifies how language is used to create meaning in an imaginative text.
6	B	50.22	48.68	Interprets a character's actions in an imaginative text.
<i>Beach safety</i>				
7	D	63.43	64.96	Identifies the purpose of an information text.
8	C	83.08	83.34	Interprets vocabulary from context in an information text.
9	A	83.38	85.08	Locates directly stated information in an information text.
10	B	82.61	83.40	Locates directly stated information in an information text.
11	C	80.48	81.28	Evaluates the importance of bold text in an information text.
12	D	56.61	57.97	Identifies the meaning of a phrase in context in an information text.
13	A	62.17	64.59	Identifies the purpose of dot points in an information text.
<i>The procession</i>				
14	C	73.92	75.07	Identifies the setting for a narrative.
15	A	29.49	30.86	Evaluates a character trait from behaviour in a narrative.
16	CD	30.13	30.51	Locates directly stated information in a narrative.
17	B	40.44	40.78	Locates directly stated information in a narrative.
18	B	30.21	30.75	Identifies the purpose of a paragraph in a narrative.
19	D	36.64	35.82	Interprets directly stated information in a narrative.

<i>Why we should care about Antarctic krill</i>				
20	A	41.89	43.34	Identifies the main idea of a persuasive discussion.
21	A	49.33	49.76	Interprets a pronoun reference in a persuasive discussion.
22	D	32.43	33.68	Identifies contrasted information in a persuasive discussion.
23	B	25.30	24.80	Interprets directly stated information in a persuasive discussion.
24	B	58.45	61.38	Identifies the author's perspective at the end of a persuasive discussion.
25	C	30.69	31.11	Identifies the main idea of a persuasive discussion.
26	A	52.83	56.09	Identifies the author's intent in a persuasive discussion.
<i>Lost and found in space</i>				
27	D	33.93	33.92	Identifies the audience of a magazine article.
28	C	26.49	26.47	Identifies the purpose of a comparison in a magazine article.
29	A	31.76	33.04	Identifies cause and effect relationship indicated in a magazine article.
30	C	19.20	19.23	Evaluates the purpose of a subheading in a magazine article.
31	B	33.50	35.06	Identifies a writer's perspective from vocabulary in a magazine article.
32	AF	20.52	21.47	Interprets vocabulary choices in context in a magazine article.
<i>Emailing Gran</i>				
33	C	21.39	21.61	Compares details to identify differences in a pair of emails.
34	BC	12.48	13.20	Analyses the purpose of an informal email greeting.
35	D	29.06	31.04	Interprets a character's opinion of a plot event in a pair of emails.
36	B	27.01	25.78	Infers the effect of a character's actions as described in a pair of emails.
37	F, F, T	28.26	30.39	Identifies true/false statements based on evidence in a pair of emails.

About the test

In 2018, the Year 3 Reading test consisted of 37 items based on six reading magazine units:

1. The pig and the puddle
2. Beach safety
3. The procession
4. Why we should care about Antarctic krill
5. Lost and found in space
6. Emailing Gran.

Most items had a standard four-option, multiple-choice format. However, Items 16 and 34 required two keys to be selected from five options. Item 32 required two words selected from a possible eight words in a one-paragraph excerpt from the text. Item 37 required three selections from a three-row, two-column table. Typically, these item formats increase complexity for students.

Items increase in difficulty as students progress through the test. Facility rates decline as students progress from the first reading unit to the last. Reading demands generally increase, distractors become more sophisticated and item construction becomes more complex.

Rather than categorise the reading units by genre, it is more useful to categorise the items by question type (see table below). This is partly because many of the reading stimulus texts contain features of multiple genres. Furthermore, reading the individual item analysis, the error analysis sometimes shows that students will select a distractor because it alludes to a specific genre. Even capable students will be drawn to these distractors.

Categorising items by *question type* puts the focus on the more relevant reading strategies. For example, an examination of the question types makes it apparent that simply underlining or highlighting text may only be useful for one of the seven question types — Literal-recall questions. See the *Implications for teaching* section in this text, and SunLANDA for a range of reading strategies that are specific to the types of questions.

	Question type:	The reader is asked to:
Literal	Recall	Recognise or recall information.
	Translation	Change information into a different form — it might involve paraphrasing the ideas or restating them in terms or forms other than those in the text.
Text-based inferential	Interpretation	Identify the relationships among ideas, definitions, facts and values — these would involve such relationships as comparisons and cause and effect; they involve a minimum of higher-order thinking as the reader/learner needs only to respond to and manipulate ideas in the text.
Higher-order (Context-based) inferential	Application	Solve real-life problems by extrapolating what is in the text — readers/learners need to combine ideas from the text with prior knowledge.
	Logical analysis	Analyse and judge the quality of the logic inherent in the text — readers/learners might, for example, identify fallacies or points of view represented in a text.
Creative	Synthesis	Respond to a problem or idea with original and creative thinking.
	Evaluation	Make judgments with respect to specific criteria.

Performance

The facility rates for the first unit, *The pig and the puddle*, are relatively high as it is the most accessible text in the Year 3 Reading test and all the items require students to exercise either literal-recall or text-based inference. Furthermore, question stems are easy to read and options simpler to interpret. Queensland students performed better in two of the items than the national average (Items 3 and 6).

Facility rates decreased in the next unit, *Beach safety*, primarily because it was a more demanding text than the previous text, *The pig and the puddle*. Also, this unit had two items (7 and 13) which required the application of context-based inference. The lower facility rates for these items suggest that students would benefit from developing their ability to make inferences, both text-based and context-based.

This pattern continues throughout the Year 3 Reading test, with students performing strongly in literal questions and text-based inference questions, but less so for context-based inference questions — unless complexity was increased by requiring more than one response or the distractors were more difficult to eliminate.

The procession had the lowest facility rates of the first three units in this year's test. Item 15 proved the most difficult. It required context-based inference. It asked students to identify a word that best described one of the characters. The low facility rate for this item is likely because two of the distractors were highly plausible. No single part of the text reveals Zoe's character trait. As with many other higher-order inferential questions, students are required to read beyond the sentence level. Students would benefit from considering the entire text when responding to context-based inference questions.

Queensland students performed better than the national average in Item 19 of *The procession*.

Why we should care about Antarctic krill was a more complex text for students. Two of the items required context-based inference, but in this unit the lowest facility rate was Item 23 which was a literal-translation reading task. Incidentally, this was the only item in this unit in which Queensland students outperformed the national average.

The reason this item was so demanding was likely because of the density of text containing challenging language for Year 3 students. The options were also more difficult to access for many Year 3 students. Students had to complete multiple tasks. They had to locate, process and retrieve relevant information from the text before translating it into a different form based on the options available and then select the correct option.

Lost and found in space appeared to be accessible for many Year 3 readers due to the subject matter and the clearly delineated sections assisted by subheadings. Queensland students performed marginally better than the national average for the first two items (Items 27 and 28). Item 32 had a low facility rate despite being a literal-translation question. This is most likely due to the requirement to choose two options. Partial marks are not awarded in NAPLAN tests.

The most difficult item in this unit was Item 30, which was a context-based inferential question. When viewing the distractors, it is apparent that the difficulty is also because the distractors are plausible. Options A and D attracted many capable students. All the distractors referenced the question mark in the subheading as it was the only subheading with a question mark — *Under control?* The key, option C, was the only one that did not contain a reference to *questions, answer or solution*.

The final unit in the Reading test, *Emailing Gran*, may appear easier as it is a less demanding text than the previous two. Also, the subject matter will be more familiar to many Year 3 students, and the items were all either literal-recall or text-based inference. However, it appears that some students were running out of time as the skip (omission) rate increased for this unit. In addition to this, complexity has been increased in other ways. Some of the items require reading both texts

(emails), although this is not always made explicit. Queensland students performed higher than the national average in Item 36.

In summary, Year 3 students had 37 questions in the Reading test. Eleven of these were literal, eighteen required a text-based inference and eight were categorised as context-based inference. Demands were increased by the fact that item complexity depends on the reading difficulty of the stimulus text and also the sophistication of the distractors. However, there is still evidence to support the idea that Year 3 students found the higher-order inferential items more difficult, as would be expected.

Question type	Average facility rate	Number of items
Literal (recall and translation)	57.15	11
Text-based inference (interpretation)	48.26	18
Context-based inference (application and logical analysis)	41.17	8

The items that involved purpose, tone and character had lower facility rates than literal and lower-order inferential items. This is because they required higher-order reasoning and comprehension. Students need to form an understanding of the whole text as well as pay attention to subtle clues in the text that help them make the inferences. As a result, implications for teaching should reflect these demands.

Implications for teaching

The lower facility rates on non-literal items demonstrate the importance of giving students strategies to help them make inferences as they read, i.e. to make statements about the unknown based on the known. Items that involve purpose, main idea, theme or tone of the text (in whole or part), challenge students. They are required to understand the whole of the text to answer the item correctly.

The challenge for teachers is to give students opportunities to read a variety of authentic and well-written texts. The teacher guides students through reading stages. In the first stage, we take an overview. What sort of text does it look like? What does it seem to be about? What do I already think about the topic? Use discussion groups to explore existing ideas on the text topic so that students can be on the lookout for what the text says that differs from what they expect.

Help students through a scanned reading of the text to identify the main structural components. Note how the parts of the text contribute towards a main idea and to the meaning of the whole. This is the time to discuss patterns (e.g. cause and effect, contrast, comparison). Teachers are the facilitators of this process of annotating and discussing texts; they are not the leaders. Their focus should be on:

- modelling a love of books and reading
- finding authentic texts at an appropriate level which will engage their students
- providing a range of genres and texts, from traditional texts to texts with postmodern elements
- promoting higher-order thinking and questioning of texts
- reading aloud to students to promote reading for pleasure

- developing an awareness of how the parts of the text combine to create a whole through both semantic (links between the ideas) and syntactic (grammatical links) cohesion
- encouraging students to make inferences as they read (i.e. an informed guess supported by evidence from the text)
- encouraging students to see connections between the text and their own knowledge and experience, between different things within the text and between this text and other texts in a similar genre or on similar subject matter (noting that applying prior knowledge without understanding what the text is communicating is one of the most common errors made by students in NAPLAN reading tests)
- encouraging students to be active readers and make connections between the text and their own knowledge, experience and feelings
- providing students with opportunities to discuss and share their understandings of a text while asking them to substantiate their interpretations from the text.

At Year 3, this structural knowledge and approach needs to be applied selectively. Some students are still grappling with basic word and grammar decoding issues. In a test setting, students will handle the distractors in the items much better if they are clear about the subject matter and the purpose of the text before they proceed to the items.

Students need practice with persuasive texts as they need to notice how modality is managed by the writer and how this affects certainty and obligation. Being able to discern a text's tone, mood and purpose are always very challenging for students in persuasive and narrative texts at all levels. Students should be encouraged to read with a pencil and highlighters in hand, to identify main ideas, visual and text features (e.g. figures of speech, use of data). It is not too early to get students in Year 3 to check for fallacies and persuasive techniques, to draw attention to emotive language and literary techniques and to check for comparisons and contrasts within the text.

Teach students to identify the main parts of a text. Show how to locate the main idea in each part. How do the main ideas relate to the author's purpose and what they hope the text will achieve? This skill is targeted in many items. One example is Item 31, where students had to identify a writer's perspective from vocabulary in a magazine article. Students were asked to identify what the word *fortunately* tells the reader about the writer. Most students interpreted this word in isolation from the rest of the text (highlighting the danger of relying on prior knowledge only). However, the reader is required to read the entire paragraph to understand the writer's position in its proper context and interpret the word *fortunately* in context to find the writer's intended meaning.

Teachers can encourage students to read for pleasure and recreation to extend their knowledge of themselves and the world around them. Reading develops a reader's empathy for people in different situations. The complexity of the reading process is made visible when students discuss texts and share how they arrive at their personal understanding of the text.

Test-wiseness

The stimulus texts that are used in reading tests are usually extracts from larger works or texts created to look like extracts. Students should be aware that these will be texts where some things are not clear. They should learn not to panic if the subject matter is not immediately accessible, as in a poem such as *Bubbles*.

QCAA resources

Full analysis of student performance and error patterns for each item is published in the SunLANDA program: <https://www.qcaa.qld.edu.au/p-10/naplan/test-reporting-analysis/sunlanda/accessing-navigating-sunlanda> and as PDF documents: <https://www.qcaa.qld.edu.au/p-10/naplan/test-reporting-analysis/test-item-analysis>. A school BIC and password is required to access each year level document. Additionally, further advice and support can be found in: QCAA 2015, *Beyond NAPLAN: How to read challenging texts*, Beyond NAPLAN series: www.qcaa.qld.edu.au/downloads/p_10/naplan_read_challenging_texts.pdf.

Numeracy

Results and item descriptions

The Numeracy strands from the Australian Mathematics Curriculum are abbreviated as follows: Number and Algebra (NA); Measurement and Geometry (MG); Statistics and Probability (SP).

All items are worth one score point. However, there is a range of difficulty across the items.

The percentage columns give facility rates (percentage correct) for each item.

Item	Strand	Answer	QLD %	Aust. %	Description
1	SP	D	96.37	96.59	Interprets a simple table to choose a particular entry.
2	NA	B	86.71	87.25	Recognises the value of Australian coins.
3	MG	A	80.94	82.76	Compares the capacity of familiar objects.
4	SP	7	90.70	91.57	Interprets a picture graph where there is a one to one correspondence.
5	NA	B	91.28	92.08	Continues a pattern that increases by two each time.
6	NA	D	71.86	74.72	Uses addition to calculate the total cost of purchasing three items.
7	MG	C	57.95	60.50	Calculates the height of one object given the relative height of another.
8	SP	B	73.89	75.98	Describes likelihood of an outcome as likely, unlikely, certain or impossible.
9	NA	8	62.55	65.96	Solves a difference (subtraction) problem involving small numbers.
10	MG	A	78.29	79.48	Selects the grid location for a position on a map.
11	NA	C	70.42	74.28	Solves a problem involving addition and multiplication.
12	NA	D	73.35	76.22	Calculates '3 times as many' to solve a problem.
13	MG	C	69.13	70.22	Uses visualisation to calculate the number of blocks needed to fill a box.
14	NA	75	60.59	63.79	Makes the largest two-digit number given three possible digits.
15	SP	38	68.23	70.08	Counts the total from a tally table.
16	NA	14,6	60.98	63.02	Uses the connection between addition and subtraction to write a number sentence.
17	NA	900	48.47	53.09	Uses place value to solve an addition problem.
18	NA	C	30.02	32.50	Rearranges tens and ones to facilitate easier

					calculation.
19	SP	A	62.09	63.43	Chooses a suitable scale to describe the data on a column graph.
20	NA	2	31.39	35.57	Determines a missing number to make a number sentence true.
21	MG	A	45.53	48.81	Tells time to the minute, connecting digital time to analogue clock.
22	MG	3,2	45.27	45.80	Identifies the faces used to make a prism.
23	NA	7	38.85	44.48	Solves a simple division problem.
24	NA	BD	53.39	54.86	Selects two number sentences that represent a multiplication scenario.
25	NA	B	38.67	43.22	Identifies a quarter of a whole subdivided into 8 parts.
26	MG	A	34.36	37.05	Identifies the two shapes that fit together to make a square.
27	NA	B	35.18	34.44	Identifies the position of an integer on a number line with limited graduations.
28	NA	D	34.14	36.58	Selects the appropriate division number sentence to represent a problem.
29	NA	B	51.82	54.52	Uses reasoning to solve a problem involving grouping and multiplication by 2.
30	MG	AB	21.20	26.14	Compares the areas of shapes by counting whole and half squares.
31	MG	C	38.71	38.59	Uses a calendar to identify a given date.
32	SP	AE	25.99	27.50	Identifies possible outcome of rolling a dice once.
33	MG	65	14.45	16.57	Reads two scales and calculates the difference in mass.
34	NA	7	17.75	21.79	Solves an equalise problem using addition and subtraction.
35	NA	AD	12.53	12.98	Select two multiplication number sentences to represent a combinations problem.
36	NA	CD	10.13	11.73	Uses knowledge of adding even and odd numbers to solve a visual problem.

About the test

The Year 3 NAPLAN Numeracy test covered concepts and skills from across the Australian Mathematics Curriculum. The NAPLAN Numeracy test consists of 36 items covering concepts and skills from three content strands. Student results are reported as a single score.

The distribution of the 36 items across the Australian Mathematics Curriculum strands was:

- Number and Algebra (20 items)
- Measurement and Geometry (10 items)
- Statistics and Probability (6 items).

Over the entire test of 36 items, 25 (69%) were multiple-choice, with the remaining 11 items (31%) requiring students to arrive at their own answers (constructed responses). Interpretation of tables, graphs or diagrams was required in 25 of the 36 items (69%). The remaining 11 items (31%) were word problems that usually incorporated numerals within the information and question stems.

Performance

While the majority of students attempted to answer all test items, a number of students omitted the more difficult items towards the end of the test. In particular, items in the constructed response format had higher omission rates than those in the multiple-choice format. The omission rate was the highest for Item 34, at 6%.

Possible reasons for higher omission rates could be the increase in complexity of the item stems. Being near the end of the test students may also have felt pressured by time and therefore not paid close attention to all of the instructions in order to complete these questions accurately.

Items with notable challenges for students included:

- Item 13 – multiple-choice: Visualisation. Students were required to visualise the number of blocks needed to fill a box. Many were unable to correctly count the blocks required.
- Item 20 – constructed response: Addition and subtraction. Students had to determine a missing number to make a number sentence true. Many experienced difficulty with the conventions regarding the use of the equals symbol, i.e. the requirements for both sides of an equation to be balanced/equal.
- Item 32 – multiple-choice: Interpreting probability. Students needed to identify all the possible outcomes of rolling a standard dice. The complexity of this item was increased as it required two results to be selected from the options, instead of the usual one option.
- Item 33 – constructed response: Measurement. Students were required to interpret two scales and calculate the difference between the two measurements.
- Item 34 – constructed response: Problem solving. Students were required to interpret a worded multistep problem requiring addition and subtraction to equalise.
- Item 35 – multiple-choice. Problem solving. Students were required to recognise the commutative property of multiplication and identify two solutions of equal value.
- Item 36 – multiple-choice: Problem solving. Students were required to understand that when an odd number is added to an even number, the result will always be an odd number.

Queensland students performed slightly better than the national facility rates in Items 27 and 31:

- Item 27 – Number and Algebra: Identifies the position of an integer on a number line with limited gradations (0.26% above the national average)
- Item 31 – Measurement and Geometry: Uses a calendar to identify a given date (0.12% above the national average)

Queensland students achieved close to the national facility rate on the following items:

- Item 1 – Statistics and Probability: Interpret a simple table to solve a simple problem
- Item 2 – Number and Algebra: Recognises the value of Australian coins
- Item 22 – Measurement and Geometry: Identifies the faces used to make a prism
- Item 35 – Number and Algebra: Recognise the commutative property of multiplication and identify two solutions of equal value.

The percentage of Queensland students answering items correctly ranged from 96% for Item 1, to 10% for Item 36. This trend is typical of NAPLAN Numeracy test performance, as the most difficult questions are located towards the end of the test.

These items were designed to discriminate between varying levels of confidence and competence. The more challenging items provided capable students with opportunities to apply their knowledge and skills to solve problems. Students with a good knowledge of a range of concepts, who are confident in using these in a variety of contexts, were more likely to solve these items given sufficient time.

For example:

Item 33 provided a real-life context where an animal was weighed before and after being rescued at an animal centre. Students were required to solve a multistep problem using two scales to measure and then compare the weight gained by an animal after it was rescued. This item had an omission rate of only 5%, with many students feeling confident answering this item. However, only 14% answered correctly. The complexity of this item is further increased as students had to interpret a combination of visual information and written text. Students unable to do so may not have had sufficient time to complete the required calculations.

Item 34 required students to solve an addition and subtraction problem. To solve this problem students needed to decide how to use the information provided to arrive at a solution. Students needed to deduce that both subtraction and addition of equal amounts is needed. This required methodical testing of values. Students felt confident answering this challenging item (omission rate of only 6%), even though only 18% of students answered correctly. Students who selected incorrect options may have found the context unfamiliar and may not have had sufficient time to complete the calculations.

The context of eating and ordering food at a restaurant in Item 35 allowed most students to engage with this question, even though only 13% of students answered correctly. Students felt reasonably confident in attempting to answer this item with an omission rate of only 5%. It is possible that students felt confident to attempt this item because it was a multiple-choice item amongst several constructed-response items. Item 35 required the understanding that multiplication is a commutative operation, meaning that when multiplying numbers, the order does not affect the product. The complexity of this item is further increased because students had to select *two* options.

Item 36 required students to solve a problem using visual clues. This item had an omission rate of 5%. Students needed to realise that if an odd number of counters are added to an even number of counters, the result will *always* be an odd number. The complexity of this item was further increased as students had to interpret a combination of visual information and written text while

satisfying *two* conditions. Students who selected incorrect options may have found the context challenging and may not have had sufficient time to complete the calculations.

Teachers may want to look at their class results and compare how their students performed on these items. Poor performance in these items may suggest that students would benefit from being introduced to a greater range of problems with slightly increased complexity to develop their ability to reason mathematically.

Schools and teachers can use overall performance data for Queensland and Australia to compare against their own data in SunLANDA. They can also use this to evaluate how difficult a particular aspect of numeracy was for all Queensland Year 3 students. If teachers combine this with similar data from previous NAPLAN tests, they can judge for themselves the relative difficulty of various concepts and skills.

Implications for teaching

Problem solving

There was evidence to suggest that students generally understand basic mathematical content — for example, that fractions are parts of a whole — but are often unable to apply this knowledge to solve a problem in a range of contexts.

The ability to translate word problems into arithmetical or algebraic expressions or equations is an important element in developing problem-solving skills.

Many teachers would expect most Year 3 students to be able to perform both addition and subtraction operations. However, the data shows that when subtraction is presented as a missing addend, or in an unfamiliar context (Items 11, 16 and 20), many students made errors. These students were not able to link addition to subtraction or understand the inverse relationship between these two operations.

Problem solving involves a plan or process using a variety of methods, either learned or reasoned, in a logical manner to find a solution. Students require opportunities to make their own decisions about how to solve a problem. Teachers can pose maths problems derived from different curriculum areas.

When a problem is encountered that requires initiative, students should be equipped with problem-solving approaches where they feel enabled to:

- Identify the problem: What am I being asked to do?
- Analyse the problem: What do I have to work with?
- Take appropriate action: Select and apply procedures to solve the problem.
- Reflect on the answer: Check my answer — Does my solution work? Is my answer reasonable? Are there other correct answers?

Students could follow a storyline, strategise, visualise what the expression could look like and evaluate the reasonableness of the answer before looking at the available options.

While all steps are important; 'Does my solution work?' and 'Is my answer reasonable?' are particularly beneficial in test situations, especially when students are asked to construct a response.

Word problems

Several items that proved difficult were those presented as word problems, describing real-world contexts, that often included diagrams or tables. Students had to interpret the presented information before determining the mathematical procedure(s) required to solve them. Many students find word problems particularly challenging. It seems that reading, interpreting and deciding what to do may be part of the difficulty.

Teachers should incorporate problem solving into their maths lessons to develop fluency and assist students to become familiar with solving problems related to the maths they are learning rather than presenting it as a separate concept.

Part of the skill required in solving items is to deduce what is important information. The strategy of underlining and/or circling key words or phrases in a word problem can help students interpret the information provided and identify what is being asked. Exposure to word problems involving each of the operations and combinations of these may help students recognise the language associated with each operation, as well as commonalities in the language.

Students should familiarise themselves with the terminology used when solving word problems. This would help develop a greater understanding.

Teachers should provide opportunities for students to share and discuss their strategies to expand students' repertoire of problem-solving strategies.

Reading the whole question more than once, the first time to get a general idea of what it is about, and subsequent readings to identify important information and what the question is asking.

Sorting information into a more useful form by drawing a sketch or diagram or making a table or list.

Complexity

Typically, item complexity was increased by the following means:

- Item 19 – determining what information is important and satisfying multiple criteria
- Item 27 – number line increasing by increments of 2, rather than the more familiar increment of 1. The use of arrows to show the continuation of the number line
- Item 28 – interpreting complicated visual representations and symbols
- Item 29 – interpreting a complex best buy item (5 for \$2)
- Item 34 – presenting the problem in a manner that students may not have been familiar with
- Items 26 and 36 – the need to select more than one option, rather than the more common single option.

Test-wiseness

Test-wiseness is any skill which allows a student to search for any unintentional clues that can be found in a test. Being test-wise allows students to pick the correct alternatives when they are not completely sure of the correct answer. The test-wise student takes advantage of cues given in class.

Students benefit from better pacing their test experience to allow more time for the most challenging questions at the end of the test.

Many of the distractors provided demonstrate that students are not routinely checking their answers for reasonableness. Students should develop the habit of considering their answers for reasonableness. See for example Items 12, 20, 29, 31 and 33.

Tables, graphs, diagrams

Of the 36 items on the 2018 Year 3 Numeracy paper, 25 items (69%) required interpretation of a grid, diagram, table, graph or other images. It is important that students have skills to interpret graphics, gain wide mathematical content knowledge and use strategies to solve a range of problems. Strategies include visualisation, spatial recognition and estimation.

Students need to recognise that the different ways that data can be represented is an important element of numeracy. Teacher-led class discussions about mathematical diagrams will help students develop the skills and experience required to interpret them and to create diagrams to solve word problems.

QCAA resources

Full analysis of student performance and error patterns for each item is published in the SunLANDA program: <https://www.qcaa.qld.edu.au/p-10/naplan/test-reporting-analysis/sunlanda/accessing-navigating-sunlanda> and as PDF documents: <https://www.qcaa.qld.edu.au/p-10/naplan/test-reporting-analysis/test-item-analysis>. A school BIC and password is required to access each year level document.

A useful reference for the teaching of spatial reasoning and geometric properties is given here:

QSA, 2005, *Mathematics: About space*,
https://www.qcaa.qld.edu.au/downloads/p_10/kla_maths_info_space.pdf.