THE AUSTRALIAN NATIONAL ASSESSMENT PROGRAM
LITERACY AND NUMERACY

# NAPLAN

## Assessment Framework: NAPLAN Online 2017-2018

acara
AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY

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# Contents

# 1 Overview

The National Assessment Program Literacy and Numeracy (NAPLAN) is a full cohort assessment of students in Years 3, 5, 7 and 9 that tests the fundamental disciplines of literacy and numeracy.

The Australian National Assessment Program Literacy and Numeracy (NAPLAN) assessment framework: NAPLAN Online 2017-2018 (NAPLAN assessment framework) is one of a suite of documents that informs the development of NAPLAN tests. Other key documents that complement the assessment framework are:

- the Australian Curriculum, which is the reference for the knowledge, understandings and skills assessed; and
- the item development guidelines that provide specific details about each test.

Taken together, interested parties can understand the:

- content basis of NAPLAN assessments within and across domains (Australian Curriculum);
- purposes, principles, and procedures that guide assessment development (NAPLAN assessment framework); and
- specifications (balance of content strands and percentages of items assessed in each) that define a test form (Item Development Guidelines).

As indicated, this NAPLAN assessment framework document describes the purposes and the principles that guide the development of NAPLAN. It also gives an overview of what NAPLAN assesses and how the tests are designed.

## 1.1 NAPLAN delivery mode

For 2017 and 2018, NAPLAN will be both paper-based and online with full uptake by schools scheduled for 2019.

As a result, the NAPLAN assessment framework refers to NAPLAN Online as the delivery mode, with arrangements for paper-based tests provided as required and summarised at Appendix 1.

## 1.2 Ensuring comparability between paper and online assessment modes from 2017

As NAPLAN will co-exist in online and paper-based forms in 2017 and 2018, care must be taken in the development of both versions to ensure comparability across assessment modes.

The paper-based tests developed during the dual-mode phase will be constructed from items used in the online test and will therefore draw on the same range of content, aligned to the Australian Curriculum. Paper-based tests will be constructed with items across the range of difficulty so that they can measure the full range of student abilities that was measured by previous paper-based tests.

ACARA research including mode effect and linking studies of groups of students taking both modes of assessment will ensure there is empirical evidence of comparability.

Further details of how comparability will be built into the assessment development process are provided at Appendix 1.

The Australian Curriculum, Assessment and Reporting Authority (ACARA) is committed to the continual improvement of the NAPLAN tests. This assessment framework will be revised as information from current and future research studies becomes available and as any revisions to the Australian Curriculum are made.

# 2 The purpose of NAPLAN

NAPLAN provides governments, education authorities, schools and the community with nationally comparable data about how young Australians are meeting educational outcomes in the key areas of literacy and numeracy.

In a world where people are increasingly mobile, the majority of today's students can be expected to live and work in a range of places in Australia and overseas. It is important that there be consistent and well understood measures of student achievement around the country, and that the outcomes of these assessments be used to inform future policy development, resource allocation, curriculum planning and, where necessary, intervention programs. NAPLAN provides useful nationally comparable evidence about student achievement.

NAPLAN is designed and developed by ACARA in accordance with the *Melbourne declaration on educational goals for young Australians* (Melbourne declaration) made by all Australian education ministers. The goals of the Melbourne declaration are:

1. Australian schooling provides equity and excellence
2. All young Australians become successful learners, confident and creative individuals, and active and informed citizens[1]

Ministers confirmed that literacy and numeracy, and knowledge of key disciplines, remain the cornerstone of education for young Australians and that the curriculum will include a strong focus on literacy and numeracy skills.[2] They committed to assessment of student progress that would be rigorous and comprehensive. Assessment would reflect the curriculum and draw on a combination of the professional judgement of teachers and testing, including national testing.[3]

Ministers committed to providing:

- schools with reliable and rich data on the performance of their students because they have the primary accountability for improving student outcomes
- parents and families with information about the performance of individuals, schools and systems to help them make informed choices and to engage with their children's education and the school community
- the community with access to information about the performance of their school compared to schools with similar characteristics
- governments with sound information on school performance to support ongoing improvement for students, schools and school sectors.[4]

[1] *Melbourne declaration on educational goals for young Australians*, Ministerial Council for Education, Employment, Training and Youth Affairs, December 2008, p. 7.
[2] Melbourne declaration, pp. 3, 4.
[3] Melbourne declaration, pp. 14, 15.
[4] Melbourne declaration, pp. 16, 17.

The *Measurement framework for schooling in Australia* specifies the agreed national key performance measures (KPMs) for schooling. The measurement framework includes KPMs on NAPLAN participation, the proportion of students achieving at or above the national minimum standard for NAPLAN reading, writing and numeracy and the mean scale scores. NAPLAN data are a key component for reporting by Australian education ministers to the community on progress towards literacy and numeracy KPMs.

NAPLAN tests are aligned to the Australian Curriculum and informed by Australian and international content and psychometric research. The NAPLAN results for all year levels in each test domain are placed on a common scale. These scales are constructed to allow achievement within each domain to be compared across year levels and across calendar years so that performance trends can be monitored and used to guide instruction. The results are reported in ways that allow for meaningful comparisons between jurisdictions and sub-groups of students.

To ensure that the assessment meets the ministers' commitments, NAPLAN:

- enables governments, education authorities and schools to determine whether young Australians are meeting important educational goals in literacy and numeracy. The data play an important role in focusing the efforts of the education community on assisting all young Australians to become successful learners.
- provides individual students with information about their progress in the literacy and numeracy aspects of the Australian Curriculum: English and Mathematics that is critical to their learning. This information can be used to see how their learning is developing and where to focus future instruction.
- gives teachers information about their students' skills and understandings. This information from NAPLAN, together with teachers' own assessment programs and judgement, allows teachers to reflect on the construction and delivery of their learning programs and identify how to support the learning needs of students.
- provides parents and carers with information that complements and extends the information provided by schools' assessment and reporting programs about their children's demonstrated abilities. NAPLAN gives parents information about how their children have performed relative to other students in the same year group and how they have performed from one testing period to the next. NAPLAN results, together with school's assessment information, help to focus the discussions parents and carers have with teachers about their students' progress.
- provides schools with an external reference about the performance of their students at a given point in time and over time, compared to students in other schools and in relation to the literacy and numeracy aspects of the Australian Curriculum: English and Mathematics. NAPLAN supports schools in the following ways:
    - NAPLAN results are best considered as one part of the whole school knowledge about student performance. However, NAPLAN provides schools with unique data that allow them to compare what they know about their

students in relation to other schools at jurisdictional and national levels and can inform whole-of-school evaluations of teaching and learning programs.
    - NAPLAN identifies individuals and groups of students who are not meeting national minimum standards. This evidence assists schools to provide beneficial intervention in the learning programs of students who most need additional support.
    - NAPLAN also identifies individual and groups of high-achieving students who will equally benefit from targeted instruction.
    - NAPLAN results focus both on the achievement of students and cohorts sitting the current assessment and their growth from previous NAPLAN administrations.

# 3 Principles for the development of NAPLAN tests

NAPLAN tests are developed to be fair and accessible for all students who are assessed, valid and reliable for all stated purposes, and to assess content that is instructionally sensitive (i.e. educative).

In order to operationalise these key principles, the following characteristics define the tests overall as well as each test item within the tests, and the reports that summarise student, school and jurisdiction performance.

The NAPLAN tests:

- align key literacy and numeracy aspects of the Australian Curriculum: English and Mathematics
- are administered under clearly specified conditions that are appropriate for all the students whose abilities are being assessed
- allow optimal participation for all students
- are developed to minimise the effect of students' diverse backgrounds.

The NAPLAN items:

- are written in Standard Australian English[5] suited to the reading capabilities of the students for whom the tests are intended
- use all learning areas of the Australian Curriculum to supply contexts for testing; however, they do not assess the content of learning areas other than English and Mathematics
- give students clear and definite instructions
- are clearly presented through appropriate choice of layout, cues, visual design format and choice of words
- allow students to show the breadth and depth of their understanding and skills

[5] English refers to Standard Australian English, the variety of spoken and written English language in Australia used in more formal settings. While it is always dynamic and evolving, it is recognised as the 'common language' of Australians. (refer: http://www.acara.edu.au/verve/_resources/Australian_Curriculum_-_English.pdf#search=shape paper English)

- have clear assessment criteria
- allow equity of access for students with disabilities
- allow equity of access for students of all genders and from different cultures and language backgrounds
- are inclusive of Aboriginal and Torres Strait Islander students' cultures, in keeping with MCEECDYA's *Aboriginal and Torres Strait Islander Education Plan 2010-2014*.

The NAPLAN reports:

- identify the nature of students' learning and indicate if intervention is needed in their learning programs
- identify strengths and weaknesses in students' understandings and skills in literacy and numeracy and their growth from previous administrations
- inform programs of teaching and learning
- assist parents to make informed choices about their children's education
- identify where governments' support can be targeted for ongoing improvements for students, schools and school sectors.

In the public reporting of NAPLAN results:

- neither students nor their teachers can be identified
- explanations help readers interpret the results in meaningful ways (e.g., reported with error bands derived from the standard error of measurement [SEMs]).

# 4 What NAPLAN assesses

NAPLAN assesses students' demonstrated abilities in key literacy and numeracy aspects of the Australian Curriculum. The assessments draw from all strands of the English and Mathematics learning areas as well as the literacy and numeracy general capabilities.

In the Australian Curriculum, general capabilities refer to a set of knowledge, skills, behaviours and dispositions that can be developed and applied across the curriculum.

The general capabilities are best embedded in content taught as part of the curriculum. Therefore, literacy and numeracy general capabilities are assessed in the NAPLAN test through the content of the English and Mathematics learning areas.

NAPLAN draws on all learning areas of the Australian Curriculum to supply contexts for testing; however, they do not assess the content of learning areas other than English and Mathematics. The Australian Curriculum describes literacy in the following way:

> Literacy serves the big and small practical, everyday communication purposes associated with living and participating in societies such as contemporary Australia. Literacy is the capacity to interpret and use language features, forms, conventions and text structures in imaginative, informative, and persuasive texts. It also refers to

> the ability to read, view, listen to, speak, write and create texts for learning and communicating in and out of school.

The Australian Curriculum describes numeracy in the following way:

> Students become numerate as they develop the knowledge and skills to use mathematics confidently across all learning areas at school and in their lives more broadly. Numeracy involves students in recognising and understanding the role of mathematics in the world and having the dispositions and capacities to use mathematical knowledge and skills purposefully.[6]

Much of the explicit teaching of literacy and numeracy occurs in the English and Mathematics learning areas and is strengthened, contextualised and extended in other learning areas as students engage in a range of activities with high literacy and numeracy demands.

NAPLAN tests are designed to assess the whole range of student performance and be sensitive enough to provide robust and valid measures of growth in student achievement against the conceptually and psychometrically sound assessment scales and proficiency standards. Consequently, the assessments are constructed so that they provide an overlap of content and skills development and growth across all curriculum year levels.

To cater for this full range of achievement, items for each year level NAPLAN assessment will be drawn from curriculum levels at, above and below year level. As the test is conducted early in the academic year, the majority of items will be drawn from the preceding year level of the curriculum. Using a "multi-staged-adaptive" design, students who demonstrate higher achievement will be branched to testlets populated with items assessing curriculum at greater complexity from within the current year level or above year level, providing the content can be solved with logical reasoning (for numeracy) or textual evidence (for reading) and is not dependent on curriculum coverage of new concepts or metalanguage. Students who demonstrate lower achievement will be branched to testlets populated with less complex items assessing important aspects of the curriculum below their current year level. How tests are developed to achieve this is outlined in the domain-specific item development guidelines.

NAPLAN is best utilised as part of a comprehensive balanced assessment system where it complements local assessment and the professional judgements of teachers in schools. Given the constraints of a full-cohort test and the limitations on time and resources, some understandings and skills in the Australian Curriculum: English and Mathematics are not assessed by NAPLAN for a number of reasons, such as an incompatible mode (for example, the speaking mode) or task (for example, constructing a 3D shape).

[6] ACARA, General Capabilities www.australiancurriculum.edu.au/GeneralCapabilities/Overview/general-capabilities-in-the-australian-curriculum

# 5 NAPLAN test design

The introduction of online testing provides the opportunity to administer tests that are better targeted to students' achievement levels and response styles. The NAPLAN Online tests (with the exception of writing) are based on a multi-stage computer-adaptive test design. This means that most of the items presented to students are within their approximate zone of achievement and level of development. The tests therefore provide more efficient and precise estimates of students' achievements than do fixed form paper-based tests in which all students attempt the same set of items.

## 5.1 Tailored test design

For NAPLAN Online, the reading and numeracy tests comprise sets of testlets[7]. Figure 1 illustrates six test pathways that are available to students at each year level. Each student works through three testlets, the second of which depends on their performance on the first, and then the third of which depends on their performance on the first and second. Each testlet contains approximately one-third of the total number of items in a test. With the content coverage across the three testlets combined to form one test, each student is assessed at a similar level of domain breadth regardless of the test pathway taken.

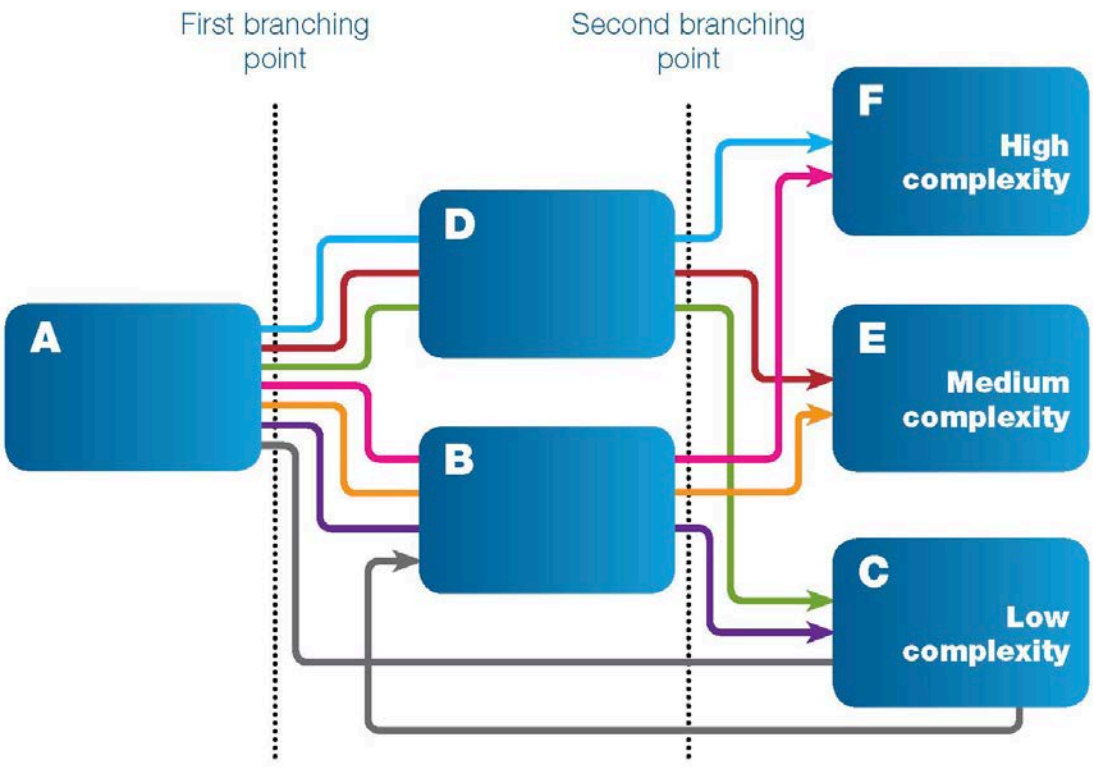


**Figure 1 :** NAPLAN Online multi-stage computer-adaptive test design – tailored test design - for the reading test and numeracy test for a given year level

[7] See pp. 12-14 to see how the tailored test design is used to target students' grammar and punctuation test.

The tailored test design incorporated in NAPLAN offers a pathway to assist students struggling with the initial items in testlet A to engage with the rest of the test. This test pathway takes students who correctly answer few, if any, items in testlet A directly to testlet C. For some students, this provides an early opportunity to engage with the easiest set of test items. Once these students respond to testlet C, they are routed to testlet B so that they have the opportunity to demonstrate the full extent of their knowledge.

Finally, in terms of targeting, the full range of student achievement testlet boundaries will be constructed so that there is a considerable overlap in the range of item complexity between different testlets both within and across the three stages of the tailored test design.

## 5.2 NAPLAN Literacy

The Australian Curriculum: English is built around the three interrelated strands of language, literature and literacy. Aspects of two of these strands, language and literacy, are also presented in the Literacy general capability. Together, the NAPLAN reading, conventions of language and writing tests assess students' developing knowledge, understandings and skills across these three interrelated strands using contexts drawn from the literature strand.

## 5.3 NAPLAN reading tests

NAPLAN reading tests assess students' ability to read and view texts to identify, analyse and evaluate information and ideas. As set out in the Australian Curriculum: English, students read texts for different purposes: personal interest and pleasure, to participate in society, and to learn. Since the emergence of visual and digital communication media, the traditional view of literacy has broadened and evolved, and viewing is now a key literacy skill. NAPLAN assesses students' ability to read and view multimodal[8] texts for literacy experience and to acquire, use and evaluate information.

The online testing environment will facilitate the assessment of reading using a range of digital texts, broadening the scope of knowledge and skills currently assessed in the paper-based assessment environment.

The Australian Curriculum describes the range of stimulus texts that might be used in NAPLAN Online in the following way:

> Texts provide the means for communication. They can be written, spoken, visual, multimodal, and in print or digital/online forms. Multimodal texts combine language with other means of communication such as visual images, soundtrack or spoken words, as in film or computer presentation media. Texts include all forms of augmentative and alternative communication, for example gesture, signing, real

[8] The first iterations of the NAPLAN Online tests will not include texts with sounds and movements. Multimodal in this document refers to written texts with graphics and images.

objects, photographs, pictographs, pictographs and braille. Texts provide important opportunities for learning about aspects of human experience and about aesthetic value. Many of the tasks that students undertake in and out of school involve understanding and producing imaginative, informative and persuasive texts, in media, every day and workplace contexts.

Although many types of texts will be easy to recognise based on their subject matter, forms and structures, the distinctions between types of texts need not be sharp or formulaic. The act of creating texts, by its nature, involves experimentation and adaptation of language and textual elements from many different writing styles and categories of texts. As a result, it is not unusual for an imaginative text to have strong persuasive elements, or for a persuasive text to contain features more typically seen in informative texts, such as subheadings or bullet points.

The Australian Curriculum identifies three distinct types of texts that have certain characteristic features that students become increasingly familiar with as they progress through their schooling[9]. Texts selected for the NAPLAN reading assessment will include these three types of texts:

- Imaginative texts— texts for which the primary purpose is to entertain through their imaginative use of literacy elements. These texts are recognised for their form, style and artistic or aesthetic value. The texts may include fiction for young adults and children, for example fairy tales, poetry, short stories, multimodal texts and extracts from novels.
- Informative texts— texts for which the primary purpose is to provide information. These texts include explanations and descriptions of natural phenomena, recounts of events, instructions and directions, and news bulletins.
- Persuasive texts— texts for which the primary purpose is to put forward a point of view and persuade, for example, advertising, debates, arguments, discussions, essays and articles.

Reading texts are selected to be interesting to students nationwide, to represent high-quality literacy and informational material, and to be free from discrimination. The subject matter of each reading stimulus text must be accessible, relevant and appropriate for students in the year level being assessed. In addition, the content and presentation of each text supports the development of different item types that assess the range of skills and understandings appropriate for the year level and that have the expected range of item difficulty for the testlet. NAPLAN assesses literacy in Standard Australian English[10]; however,

[9] ACARA, English glossary, http://www.australiancurriculum.edu.au/english/glossary#T

[10] English in the *Australian Curriculum* refers to Standard Australian English, the variety of spoken and written English language in Australia used in more formal settings. While it is always dynamic and evolving, it is recognised as the 'common language' of Australians. (refer: www.acara.edu.au/verve/_resources/Australian_Curriculum_-_English.pdf#search=shape)

in keeping with the principles for the development of NAPLAN tests, the word choices and content of test items are culturally accessible.

The appropriateness of a stimulus text for a target year group is determined by both the topic and the text complexity. As the latter is a composite of factors, some easily quantifiable (e.g. word, sentence and text length), and others requiring professional judgement (e.g. assumed background knowledge, structure and clarity), it is difficult to provide a definitive guide for targeting texts to students. The tailored test design will cater for the wide range of ability levels at each year group by allowing short, simple texts with visual support to be presented to the lower ability students branched to the C testlets and longer, more lexically dense and structurally complex texts to be presented to the higher ability students branched to the F testlets.

Judgements about text complexity and the appropriateness of texts for the target year group will be guided by both curriculum expectations (as described in the level descriptions from the Australian Curriculum: English) and psychometric evidence of the performance of Australian students as measured by NAPLAN.

Students are assessed on their ability to locate explicitly stated information; make straightforward inferences; interpret and integrate ideas and information, and examine and evaluate content, language and textual elements. The extent to which these skills are assessed varies for each year level and is influenced by the structure, content and complexity of the stimulus texts that students will be required to read.

The cognitive processes that assess these skills are:

- *Locating and identifying.* Locating involves retrieving details and facts from within a text (reading stimulus that may be only written text or a combination of written and visual texts). The location of that detail within the text and whether it is at the beginning of the text or embedded at the end of the text affects the difficulty of the item, as does the difficulty of the text itself. Identifying this information requires the reader to scan, search for, locate and select relevant information. Again the difficulty of the item is determined not only by the complexity of the text but also by whether the information is explicitly stated or whether the student has to categorise information, discriminate between two similar pieces of information or discard competing information.
- *Integrating and interpreting.* Integrating focuses on demonstrating an understanding of the coherence of the text. It can range from recognising local coherence between adjacent sentences to understanding the relationship between several paragraphs across a text. Interpreting refers to the process of making meaning from something not stated. Interpretation items require the reader to identify the underlying assumptions or implications of part or all of the text but these items may not necessarily be more difficult than items that require students to access and retrieve information. The difficulty of the item will depend, among other factors, upon the difficulty of the text and whether the type of interpretation is commonplace.

- *Analysing and evaluating* involves drawing upon knowledge, ideas and attitudes both within and beyond a text, and across multiple texts. These items assess students' ability to draw on their own knowledge and experiences to compare, contrast or hypothesise.

ACARA's research into the readability and layout of texts in an online multi-device environment informs the presentation of the stimulus texts to meet the differential needs of students. Graphics and visual images, where used, will support the reading and understanding of a text, and will be clear and accessible.

## 5.4 NAPLAN conventions of language test

The conventions of language test focuses on the accurate knowledge and use of the spelling, grammar and punctuation conventions of Standard Australian English. This test complements the writing test, that includes the role that spelling, grammar and punctuation play in the construction of meaning at the text level, and the NAPLAN reading test, where understanding the conventions used in a text contribute to identifying and responding to its meaning.

The NAPLAN conventions of language test is made up of two separate tests: a grammar and punctuation test and a spelling test.

### 5.4.1 Grammar and punctuation test

The grammar items in the grammar and punctuation test focus on knowledge and accurate use of grammar at a sentence, clause and word level. Grammar items are developed from the content of the Australian Curriculum: English sub-strand threads of text cohesion, sentences and clause level grammar and word level grammar.

The punctuation items in the test focus on the identification of accurate use of punctuation conventions. Punctuation items are developed from the content of the Australian Curriculum: English sub-strand thread of punctuation.

Online, students will sit the grammar and punctuation test after they have completed the reading test. Depending on whether they were administered testlet C, E or F of the reading test, students will be directed to interlocking grammar and punctuation testlets C, E or F. This approach provides the advantage of the adaptive design to the grammar and punctuation test in an efficient manner.

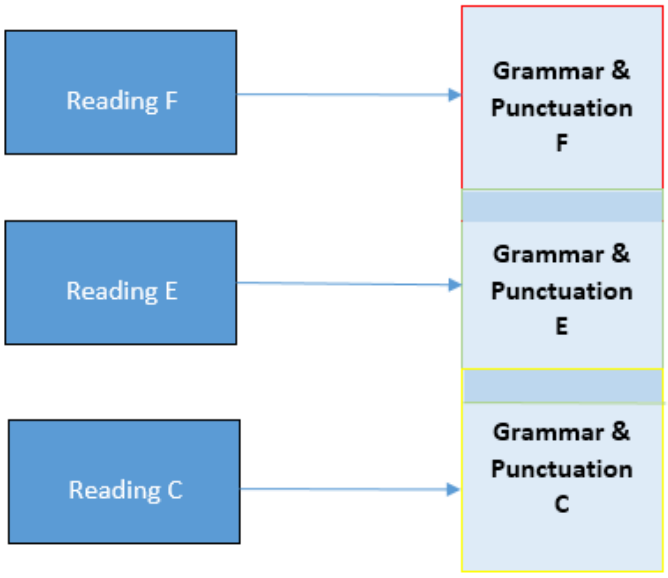


**Figure 2:** NAPLAN Online Interlocking grammar and punctuation testlet design for a year level.

### 5.4.2 Spelling test

The NAPLAN spelling test focuses on the accurate spelling of written words, and consists of an audio component and a proofreading component. Spelling items are developed from the Australian Curriculum: English sub-strand thread of spelling.

The selection of spelling words occurs by canvassing the broad range of spelling features in English and then focussing the level of difficulty as appropriate to year level, verified by trialling. The selection of spelling items and the features of the test forms combine to provide information about the capacity of the students to correctly spell a range of words.

The proofreading component of each spelling test comprises equal numbers of two main item classifications:

- Mistake identified, where the task is to write the correct spelling of a designated word, identified by underlining or italicisation
- Mistake not identified, where the task is to identify the incorrectly spelt word from other competing words and then to write the correct spelling. All items are constructed in the form of a full sentence with a reading difficulty level appropriate to the difficulty of the item.

### 5.4.3 Audio component

Online students will be provided with a common set of items in testlet S1 (see *Figure 4*) in which words are presented in context sentences via an audio file. Students type their responses into an answer box. Depending on their performance on S1, students are directed to one of two additional sets of items, namely testlet S2 or testlet S3. Accommodations will be made for students with hearing impairment. Students' responses will be automatically machine-scored.

### 5.4.4 Proofreading component

A proofreading component follows the audio component for NAPLAN Online. The starting point for students will be determined by their performance on the audio component. Students who were directed to S3 (the easier of the second sets of audio-spelling items) will be directed to P2 (the easier set of two proofreading testlets). Students who were directed to S2 (the more challenging set of items) will be directed to either P2 or P1 depending on their performance on S2.

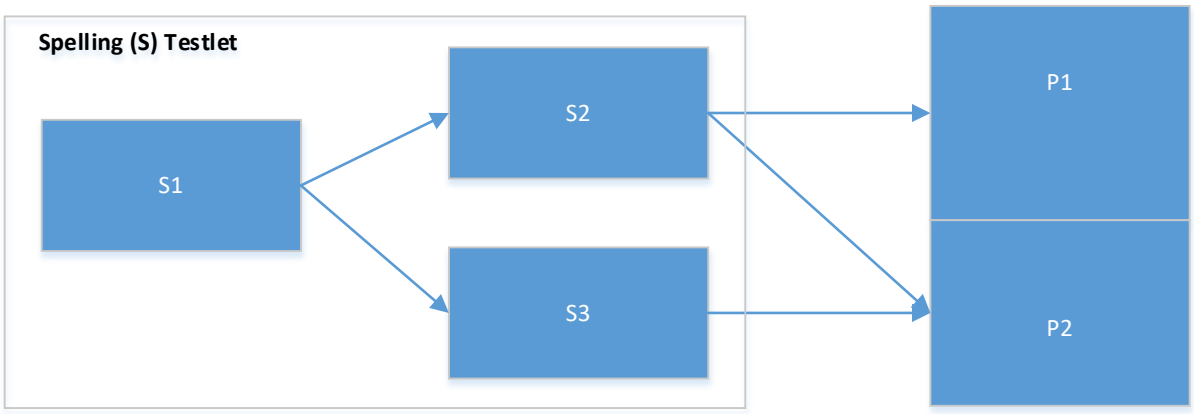


**Figure 3:** NAPLAN Online testlet design for spelling for a year level.

## 5.5 NAPLAN writing test

The NAPLAN writing test focuses on the accurate, fluent and purposeful writing of either a narrative or persuasive text in Standard Australian English. It assesses student performance against ten criteria[11]:

- audience
- text structure
- ideas
- character and setting (narrative); persuasive devices (persuasive)
- vocabulary
- cohesion
- paragraphing
- sentence structure
- punctuation
- spelling

The NAPLAN writing test complements the NAPLAN conventions of language test assessing spelling, grammar and punctuation within the context of writing.

[11] ACARA will be examining the reliability and validity of the scoring rubric developed to incorporate these criteria as part of its next four-year work plan; revisions will be made as warranted.

The NAPLAN writing test aligns with the Australian Curriculum: English through a focus on the following sub-strand threads:

- Purpose, audience and structures of different types of texts
- Vocabulary
- Text cohesion
- Sentences and clause level grammar
- Word level grammar
- Punctuation
- Spelling

The NAPLAN writing test aligns with the Australian Curriculum: English through a focus on three central types of texts that are essential for students to master if they are to be successful learners, confident and creative individuals, and active and informed citizens: *persuasive*, *imaginative* and *informative*. NAPLAN has until now assessed *narrative writing* (which is a form of *imaginative writing)* and *persuasive writing*. The assessment of *informative writing* in NAPLAN may also be included in future tests.

The features of the three central types of texts are:

- *Imaginative texts*—texts for which the primary purpose is to entertain through their imaginative use of literary elements. They are recognised for their form, style and artistic or aesthetic value. These texts include novels, traditional tales, poetry, stories (also known as narratives), plays, fiction for young adults and children including picture books and multimodal texts. Narrative-style imaginative texts typically use time-order to relate events and have a broader purpose of entertaining and emotionally engaging an audience. Other social purposes of imaginative writing may be to inform, to persuade and to socialise. For a NAPLAN writing test, students may be asked to write a story that is centred on an idea, tension or conflict, and use a structure that has an orientation, a complication, and a resolution.

- *Persuasive writing*—texts for which the primary purpose is to put forward a point of view and persuade a reader, viewer or listener. They form a significant part of modern communication in both print and digital environments. They include advertising, debates, arguments, discussions, polemics and influential essays and articles. Crafting persuasive texts requires critical thinking, the ability to consider own views as well those of others, and the ability to juxtapose ideas within sentences and across the text. A NAPLAN writing prompt of this text type is constructed to allow students to convince the reader to adopt a given point of view or urge the reader toward a specific action.

- *Informative writing* - texts for which the primary purpose is to inform. Informative writing includes explanations and descriptions with the express purpose of informing the reader. It is one of the most commonly used writing forms and is central to

> learning across the curriculum. The writer cannot assume that the reader has prior knowledge or prior understanding of the topic and therefore has to write very clearly. This clarity is achieved by careful selection of words that clearly convey the intended meaning, and by the careful structuring of sentences and the text so that the reader can easily follow the relationship of ideas. A NAPLAN writing prompt of this text type either provides the students with the necessary information or requires students to have sufficient content knowledge of the topic for them to be able to demonstrate their writing skills.

Students' writing in the NAPLAN writing test is elicited through the use of writing prompts. A prompt contains a writing task on a specified topic that requires students to respond in a particular text type – one of persuasive, imaginative or (in time) informative writing. A prompt may also contain images that support the development of ideas on the topic. In the past, all students from years 3 to 9 have been given the same single prompt with the same topic. In 2015, this was modified to a two-prompt model in order to improve the accessibility of the tasks for all students by providing more age-suited topics. One prompt was used for Year 3 and Year 5 students and a different prompt was used for Year 7 and Year 9 students. Both prompts required a response in the same text type, but the topics were different. In the future, and particularly when writing is tested in the online environment, a wider variety of prompts may be used. Different prompts may be used both within a year level and across year levels, and the prompts may also require students within and across year levels to write responses in different text types.

Writing prompts are trialled to ensure they are comparable in difficulty and that they are accessible to all students but also extend the most capable students.

## 5.6 NAPLAN numeracy tests

NAPLAN numeracy tests assess students' application of mathematics knowledge and skills within everyday contexts. Students develop the underpinning skills and knowledge for numeracy in the Mathematics learning area, and then apply and refine these skills and deepen their knowledge as they progress through school and interact with others within their daily lives.

Numeracy and mathematics are different from each other, but inter-related. A numerate adult is able to interpret a situation as one in which mathematics is needed, choose the appropriate mathematics to use, apply a range of mathematics concepts, facts, procedures and thinking skills and to interpret, apply and evaluate mathematics outcomes. They can judge whether a result is reasonable in the context, interpret and analyse situations mathematically and communicate using mathematical language and concepts.[12]

[12] http://www.oecd.org/pisa/pisaproducts/Draft%20PISA%202015%20Mathematics%20Framework%20.pdf
http://webarchive.nla.gov.au/gov/20130329054234/https://www.coag.gov.au/node/192#

The Australian Curriculum: Mathematics provides the mathematics language, concepts, facts, procedures and thinking skills required to enable students to have the disposition and capacity to use mathematics knowledge and skills purposefully. The Australian Curriculum: Mathematics is organised around the interaction of three content strands and four proficiency strands. The proficiency strands are understanding, fluency, problem solving, and reasoning. These capabilities enable students to respond to familiar and unfamiliar situations by employing mathematical thinking skills and strategies to make informed decisions and solve problems efficiently. They describe the thinking and doing of mathematics, and as such are the basis for the numeracy skills indicated above. The three content strands of number and algebra, measurement and geometry, and statistics and probability comprise the mathematics concepts, knowledge, skills and understandings to be taught and learnt at each of the year levels. The NAPLAN numeracy test assesses students' contextualised use of their mathematics knowledge, skills and understanding from these three strands. The development of the conceptual understandings of each of these strands and their sub-strands is represented in the scope and sequence of the Australian Curriculum: Mathematics[13].

NAPLAN numeracy assesses mathematics situated in contexts that are relevant and engaging for students. Careful consideration is taken in balancing the requirement to establish a context for an item with the numeracy demand introduced when setting up that context. Contextual information includes problem scenarios, explanations, instructions and background information, and may be presented in words, in a graphical format or a combination of both. The contexts used are accessible, realistic, and appropriate for students in the year level being assessed; meaningful to the mathematics being assessed; and sufficiently succinct to set up the problem without any unnecessary cognitive load. Care is taken to make sure that contextual information does not interfere with the mathematics being assessed or become a barrier to the students being able to demonstrate their mathematical understanding. The online test will allow students to hear numeracy items read aloud. (As per the paper test, where the test administrator is able to read items to students.)

Graphics such as pictures, photographs, charts, and diagrams are frequently incorporated in NAPLAN numeracy items, and are used where the key skill or understanding assessed by the item requires that information be presented in a visual format. Graphics are also used to increase the accessibility of items by reducing the reading load for students or for illustrating mathematical concepts in the text.

The number of numeracy items will change from 2017 for both paper and online tests. The changes to the numeracy test include:

- Year 3: tests will increase from 35 to 36 questions
- Year 5: tests will increase from 40 to 42 questions
- Year 7 and Year 9: test will reduce from 64 questions to 48 questions

[13] http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?layout=1

These changes are consistent with the expectations of the Australian Curriculum and other NAPLAN domains. ACARA studies indicate that this reduction in items (for Year 7 and Year 9) will not significantly affect the reliability of the numeracy test at either the student or cohort level.

Both modes of assessment (paper and online) will contain the same number of items. (See Appendix 2: Paper and Online test specifications by domain).

### 5.6.1 Use of calculators

The Australian Curriculum: Mathematics assumes that calculators and computers are used as natural media for mathematics learning within a technologically-rich environment. Therefore, the general premise is that calculators can be used at all year levels in the NAPLAN Online numeracy test.

While the Australian Curriculum allows for calculator use in Years 3 and 5, due to pedagogical considerations Year 3 and Year 5 students will not be permitted at this time to use calculators in NAPLAN tests.

Year 7 and 9 students will be administered both calculator and non-calculator items as per previous paper practice. The online numeracy test will include a short non-calculator section at the beginning of each test. Students complete this section of the test before they move to the following section where the calculator is available.

The non-calculator section of the Year 7 and 9 numeracy test will focus specifically on mental calculation skills to highlight the importance of these basic skills. Previously items assessing mental calculation skills were embedded throughout the non-calculator section and were therefore not highlighted. While the non-calculator section of the test will be shorter, the number of questions that require mental calculation will not change.

Table 1 shows a comparison of the 2017 and 2016 calculator expectations. The numeracy test includes items which are:

1) Calculator highly beneficial
2) Calculator helpful but not required
3) Calculator neutral

The percentage of items across the three categories is comparable for online and paper and consistent with previous years.

**Table 1: Comparison of 2017 and 2016 Calculation Expectations**

| | Non-Calculation | Calculator Helpful | Calculator Essential | TOTAL |
|---|---|---|---|---|
| **Numeracy 7 CALCULATOR SECTION** | | | | |
| 2017 | 22 | 7 | 11 | 40 |
| 2016 | 14 | 4 | 14 | 32 |
| | | | | |
| **Numeracy 7 NON-CALCULATOR SECTION** | | | | |
| 2017 | 1 | 4 | 3 | 8 |
| 2016 | 17 | 10 | 5 | 32 |

## 5.7 Accessibility

While all items are developed with accessibility for all students in mind, NAPLAN provides research-based adjustments for students with disabilities[14] to allow them to more fully access and participate in NAPLAN tests. The available adjustments are set out in the NAPLAN National protocols for test administration (NPTA).

The adjustments are designed to enable access to NAPLAN on an equivalent basis to students without disability. The adjustments allow the test to measure the student's literacy or numeracy performance, rather than measuring the impact of the student's disability or disabilities on their test experience.

NAPLAN Online will enable individual students with disability access at least equivalent to what is currently possible for them in paper-based NAPLAN tests. The available adjustments will be set out in the NAPLAN National protocols for online test administration.

ACARA's accessibility study will ensure that students with disability are not disadvantaged when undertaking NAPLAN Online tests.

[14] Disabilities as defined in the Disability Discrimination Act 1992

# 6 Item writing and test construction

## 6.1 Item writing

All NAPLAN items are developed in accordance with explicit item and test specifications. The *Item development guidelines*, written for each of the four NAPLAN tests, contain testlet and test design, and curriculum coverage. For example, the specifications include the number and types of items that will be in each test, the range of content – as determined by the Australian Curriculum, and psychometric requirements, such as the item difficulty range that will be covered in each testlet and across each test pathway that is necessary for reliable and valid measurement.

An important part of the item development process is describing the knowledge, skills and understandings that are assessed by each item through the writing of item descriptors. Item descriptors articulate specific aspects of the knowledge, skills and understandings assessed in an item, as informed by the test specifications, and have explicit links made to the content descriptions in the curriculum through the alphanumeric codes uniquely assigned to each of these descriptions. As the majority of items will not be released when online testing commences, the information in the item descriptors, and the alignment of items to the content descriptions, will provide important information for teachers about the areas of the curriculum that their students have or have not mastered, and for the monitoring of their teaching programs.

Standard Australian English is used in NAPLAN. Every attempt is made to ensure that the language of the test items is accessible to all students, including students for whom English is an additional language or dialect (EAL/D). Care is taken to ensure that the language demand of the items does not exceed the level of difficulty of the understanding or skill being tested, or impose unnecessary or irrelevant literacy demands on students.

Item writers work to ensure equity of access for students of all genders and from different cultures and language backgrounds, including Aboriginal and Torres Strait Islander students; and that there is a diversity of representation in the visual images, names, family situations, contexts and locations used to frame items. The test specifications will provide clear guidelines for the selection of subject matter and context to all item developers, to ensure that they do not include material that may be biased or offensive towards particular cultural groups.

All items and test stimulus materials are reviewed by curriculum and measurement experts in the ACARA assessment team and representatives from the test administration authorities (TAAs) to ensure curriculum alignment, relevance and fairness. TAAs include reviewers who are able to provide feedback regarding the suitability of potential test materials from equity perspectives, including the appropriateness of the materials for Aboriginal and Torres Strait Islander student; students whose second language is English or for whom English is an additional dialect (ESL and EAL/D); and students with disability.

Items are subject to extensive trialling to ensure that all items included in the final tests have acceptable psychometric properties and to ensure their validity and reliability. Samples of students from all states and territories participate in NAPLAN trialling.

## 6.2 Item types

Students' knowledge, skills and understandings are assessed through a range of item types. The majority of items are multiple choice and where appropriate, schools will be provided with information about students' incorrect choice of strategies that point to possible underlying misconceptions.

Students are also assessed using a number of different technology enhanced item types. ACARA uses Item Authoring and Review System software, which includes the following IMS Question & Test Interoperability (QTI™) formats:

- Composite
- Drawing
- Extended text
- Hot text
- Hotspot
- Interactive associate
- Interactive gap match
- Interactive graphic associate
- Interactive graphic gap match
- Interactive graphic order
- Interactive match
- Interactive order
- Match
- Multiply choice
- Multiple choices
- Position object
- Select point
- Slider
- Text entry

Item types are selected to match the skills, knowledge and understandings being assessed and to ensure a variety of types are included across the testlet pathways.

Human scoring of student responses will not be possible given both the tailored test design and the need to provide preliminary results to schools in a short timeframe. Until the validity of the automatic marking of short response items improves, some of the above formats will be excluded from the tests. The writing assessment will be marked using a combination of human and machine scoring.

An automated essay scoring (AES) system has been procured for NAPLAN Online.

ACARA is conducting an AES study expanding on an initial feasibility study conducted in 2013. The research will more closely mirror NAPLAN administration, scoring conditions and procedures and produce the second report on the application of AES in marking NAPLAN writing.

At the July 2016 meeting, ministers noted that the use of AES for scoring NAPLAN Online writing will include 100% double scoring (computer and human) in 2017.

The extent of AES use in 2018 and beyond is subject to the results of 2017 and ACARA's ongoing research and mitigation strategies.

## 6.3 Item development for the reading test

The scope and sequence of the Australian Curriculum: English describes increasingly sophisticated and refined knowledge and skills. This development is reflected in the increasing cognitive demand of items within a test for a year level and across the tests for all years tested. For reading, a particular challenge is the relationship between the difficulty of the test item and the degree of test complexity. In the Australian Curriculum: English, the year level description precedes the content at each year level, and contains a description of expected text complexity. The understanding of the relationship between item difficulty and text complexity is integral to ensuring that the correct balance of items is presented within each testlet. While a simple text will generally support the development of a higher proportion of access and retrieval-type items, complex texts will contain a higher proportion of evaluative items. However, a simple retrieval question in a complex text may present a higher cognitive load than an item requiring an evaluation in a simple text.

## 6.4 Item development for the numeracy test

The scope and sequence of the Australian Curriculum: Mathematics describes increasingly sophisticated and refined mathematical understanding, fluency, logical reasoning, analytical thought and problem-solving skills. A particular challenge in devising a test that assesses a specified curriculum is the relationship between the depth of understanding and complexity of skills described in that curriculum and other factors that contribute to item difficulty. These factors include the difficulty of the computation required; whether students have to complete one step to reach the correct answer or several steps; and the familiarity of the context used in the item. These factors are continually considered during the review and trialling processes.

## 6.5 Item development for the conventions of language test

The conventions of Standard Australian English as identified in the Australian Curriculum determine the content for the conventions of language test. These conventions underpin the use of English and are integral to both reading and writing, and hence the skills, knowledge and understandings about the conventions are drawn from the reading and writing strands of the curriculum. As a general rule, the reading strand informs items covering the receptive aspects, such as a recognition and identification of the conventions, and the writing strand informs items covering the production aspects of the conventions.

## 6.6 Item development for the writing test

The writing test will assess students' ability to write (with a keyboard or in handwriting according to the school's chosen method of administration during the transition phase) across the range of text types articulated in the Australian Curriculum. The role of the prompt in a writing test is to inform students what type of writing is required, and on what topic. In doing this it will allow students the opportunity to best demonstrate their skills.

The following may be considered when developing prompts for the writing tests:

- student familiarity with the subject matter associated with the topic
- age-appropriate tasks aligned to the Australian Curriculum: English
- the use of same or different text types in the same test

- the potential for choice within a topic to allow students maximum opportunity to demonstrate their best writing
- the rubric that will be used to assess the written responses
- equating methodologies associated with a multi-prompt test model

## 6.7 Constructing the tests

Items for inclusion in the NAPLAN test are selected from the ACARA item bank of trialled items. The selected items will meet the detailed test specifications, such that the tests cover the appropriate range of knowledge, understandings and complexity of skills in the identified literacy and numeracy aspects of the Australian Curriculum: English and Mathematics.

Curriculum, assessment and measurement experts review all items. Any issues raised during the review process will be resolved before items are selected for final tests. A joint collaborative process is followed to ensure that all items selected for the final tests align with the Australian Curriculum and have the necessary psychometric properties for a valid and reliable assessment.

# Appendix 1: NAPLAN paper-based tests 2017 and 2018

From 2017, NAPLAN tests will be available online. However, during the transition phase ACARA will continue to produce a paper-based NAPLAN test.

For 2017 and 2018 the items for the paper-based test will be a subset of the items presented online; however, the branching aspects of the tailored test design will not be replicated.

The paper-based tests developed during the dual-mode phase will be constructed from items used in the online test and will therefore draw on the same range of content, aligned to the Australian Curriculum. Paper-based tests will be constructed with items across the range of difficulty so that they can measure the full range of student abilities that was measured by previous paper-based tests, though with somewhat lower precision at the tail ends of the distribution.

ACARA has developed updated test specifications for each of the paper-based NAPLAN tests in 2017.

As NAPLAN will co-exist in online and paper-based forms in 2017 and 2018, care must be taken in the development of both versions to ensure comparability across assessment modes.

To ensure comparability between the online and paper-based forms, ACARA will incorporate the following procedures:

- Conceptualise the paper-based version as covering the same breadth and depth of its online counterpart;
- Maintain the same NAPLAN reporting scale as currently exists and report both modes on that scale;
- Consult with psychometric experts (eg, Measurement Advisory Group, Online Assessment Working Group), content experts (eg, National Testing Working Group) and other ACARA reference groups (eg, NADAR) for review of proposed linking procedures;
- Build the NAPLAN tests using item types that have been shown to perform comparably across modes of assessment;
- Perform extensive mode effect and linking studies, including groups of students taking both modes of assessment.

# Appendix 2: Paper and online test specifications by domain

**Numeracy**

| Year level | Paper test<br>2008-2016 | Paper test<br>2017 | Online<br>2017 | Online & paper<br>2018 |
|---|---|---|---|---|
| **Year 3 Numeracy** | 35 items<br>(all non-calculator) | 36 non-calculator | 3 testlets of 12 items<br>36 items<br>(all non-calculator) | 36 non-calculator |
| **Year 5 Numeracy** | 40 items<br>(all non-calculator) | 42 items<br>(all non-calculator) | 3 testlets of 14 items<br>42 items<br>(all non-calculator) | 42 non-calculator |
| **Year 7 Numeracy** * | two tests:<br>32 items non-calculator<br>32 items calculator-allowed | One test session with two parts:<br>8 non-calculator<br>40 calculator-allowed | One test<br>3 testlets of 16 items<br>48 items<br>(8 non-calculator, 40 calculator-allowed) | 8 non-calculator, 40 calculator-allowed* |
| **Year 9 Numeracy** * | two tests:<br>32 items non-calculator<br>32 items calculator-allowed | One test session with two parts:<br>One test session:<br>8 non-calculator<br>40 calculator-allowed | One test<br>3 testlets of 16 items<br>48 items<br>(8 non-calculator, 40 calculator-allowed) | 8 non-calculator, 40 calculator-allowed* |

* Year 7 and Year 9 numeracy tests will both reduce from 64 items (32 non-calculator and 32 calculator) to 48 items (8 non-calculator, 40 calculator). This change is aligned to the Australian Curriculum, is consistent with other domains, allows for sufficient measurement, and provides a mix of calculator and non-calculator items facilitated by the technology.

**Reading**

| Year level | Paper test<br>2008-2016 | Paper test<br>2017 -18 | Online<br>2017 -18 |
|---|---|---|---|
| **Year 3 Reading** | 6 stimulus<br>39 items | 6 stimulus<br>39 items | 3 testlests<br>2-3 stimulus /testlet<br>13 items/testlet |
| **Year 5 Reading** | 6 stimulus<br>39-40 items | 6 stimulus<br>39 items | 3 testlests<br>2-3 stimulus/testlet<br>13 items/testlet |
| **Year 7 Reading** | 8 stimulus<br>49-50 items | 8 stimulus<br>48-50 items | 3 testlests<br>2-4 stimulus/testlet<br>16 items/testlet |
| **Year 9 Reading** | 8 stimulus<br>49-50 items | 8 stimulus<br>48-50 items | 3 testlests<br>2-4 stimulus/testlet<br>16 items/testlet |

**Language Conventions (LC): Spelling (SP) and Grammar & Punctuation (G & P)**

| Year level | Paper test<br>2008-2016 | Paper test<br>2017 -18 | Online<br>2017 -18 |
|---|---|---|---|
| **Year 3 Spelling**<br>**Year 3 Grammar & Punctuation** | SP: 25 items – all proof reading<br>G & P: 25 items | SP: 25 items proof (Mistake Identified/Mistake Not Identified)<br>G & P: 25 items | SP: 15 audio /10 Proof<br>G & P: 25 items – one testlet – determined by reading<br>(25C, 25E, 25F – minus links) |
| **Year 5 Spelling**<br>**Year 5 Grammar & Punctuation** | SP: 25 items – all proof reading<br>G & P: 25 items | SP: 25 items proof (Mistake Identified/Mistake Not Identified)<br>G & P: 25 items | SP: 15 audio /10 Proof<br>G & P: 25 items – one testlet – determined by reading<br>(25C, 25E, 25F – minus links) |
| **Year 7 Spelling**<br>**Year 7 Grammar & Punctuation** | SP: 30 items – all proof reading<br>G & P: 30 items | SP: 25 items proof (Mistake Identified/Mistake Not Identified)<br>G & P: 25 items | SP: 15 audio /10 Proof<br>G & P: 25 items – one testlet – determined by reading<br>(25C, 25E, 25F – minus links) |
| **Year 9 Spelling**<br>**Year 9 Grammar & Punctuation** | SP: 30 items – all proof reading<br>G & P: 30 items | SP:25 items proof (Mistake Identified/Mistake Not Identified)<br>G & P: 25 items | SP: 15 audio /10 Proof<br>G & P: 25 items – one testlet – determined by reading<br>(25C, 25E, 25F – minus links) |

**Writing**

| Year level | Paper test<br>2008-2016 | Paper test<br>2017 -18 | Online<br>2017 -18 |
|---|---|---|---|
| **Year 3/5 & 7/9 Writing** | One task – Narrative or Persuasive | One task – Narrative or Persuasive | 1 of 2 tasks Narrative or Persuasive |