



Development of accessible

NAPLAN online items GUIDELINES

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acara
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The *Guidelines for the development of accessible NAPLAN online items* (the Guidelines) inform item writers of approaches they must apply to item design, to maximise the accessibility of the NAPLAN test for students with disability on the same basis as students without disability. The approaches support students who use text as their main literacy medium and include students who may have motor, vision and/or hearing impairment. The Guidelines also inform item reviewers about what to look for when considering feedback on item accessibility.

The Guidelines apply to content authored for NAPLAN tests within the National Assessment Platform (the platform) where the platform supports it. Items are designed within the technical specifications of the platform. ACARA and all stakeholders of the platform work with Education Services Australia to achieve WCAG 2.0 AA compliance for all platform elements. Local device constraints may impact on student experience. WCAG 2.0 AA specifications - Web Content Accessibility Guidelines (W3C World Wide Web Consortium, 2008) inform recommendations for making web content more accessible to a wider range of people with disabilities. Test item writers are required to follow these guidelines.

The platform is also continuing to undergo development and improvement. Principles developed and reviewed by stakeholders and accessibility experts guide platform development.

The Guidelines are a working document. ACARA acknowledges the role of wider stakeholder consultation – including the National Testing Working Group (NTWG), the Online Accessibility Expert Advisory Group (OAEAG), and the Students with Disability Advisory Group (SWDAG) and experts in this field – in continuing to inform the development of these guidelines.



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PART 1: Background and guiding principles

These Guidelines are intended to assist item authors in achieving accessibility compliance when designing items for NAPLAN online tests. They outline the considerations necessary to ensure student accessibility.

It is essential that accessibility adjustments informing item development are:

- supported by a sufficient evidence base demonstrating their impact and their effectiveness for a specific identified student user group/s with a specific identified need/s
- compatible with the NAPLAN test construct
- operationally feasible within the constraints of the platform functionality at any given time
- deliverable on an equitable basis.

There are separate item development guidelines for the Reading, Numeracy and Conventions of language tests that address content and psychometric specifications. Item developers require a sound knowledge of these domain-specific guidelines to support their understanding of, and compliance with, the *Guidelines for the development of accessible NAPLAN online items*.

Item developers and reviewers need to be familiar with the accessible item design checklist at Appendix 1 before starting work. Detail on each guiding principle and its application to accessible item design is provided in Part 2.

Research

Much of the research supporting the adjustments listed in this document has been gathered using guidelines developed by the Round Table on Information Access for People with Print Disabilities Inc. The Round Table documents support persons with vision impairment, physical disabilities and/or perceptual or other disabilities which limit their ability to follow a line of print or which affect their concentration. These include:

- Guidelines for Producing Clear Print (2011)¹
- Guidelines for Producing Accessible E-text (2018)²
- Guidelines for Conveying Visual Information (2005)³
- Guidelines for Sound Advice (2013)⁴

¹ <http://printdisability.org/guidelines/guidelines-for-producing-clear-print-2011/>

² <http://printdisability.org/guidelines/guidelines-for-accessible-e-text-2018/>

³ <http://printdisability.org/guidelines/guidelines-on-conveying-visual-information-2005/>

⁴ <http://printdisability.org/guidelines/sound-advice-guidelines-2013/>



During the item design process ACARA has also sought research to inform decision making about accessibility options for students with disability. Some of this research includes the following reports:

- Review of ACARA Accessibility Research Study: Implications and Recommendations for Accessibility for Students with Vision Impairment (E. H. White, 2017)
- Review of NAPLAN Online Tests for Accessibility for Students with Vision and/or Motor Impairments (E. H. White, 2017)
- National Assessment Program – Literacy and Numeracy Online Assessment Research Accessibility Options for Students with Disability (ACER, 2014)

WCAG 2.0 AA specifications - Web Content Accessibility Guidelines (W3C World Wide Web Consortium, 2008) inform recommendations for making web content more accessible to a wider range of people with disabilities. Test item writers are required to follow these guidelines.

Legislation

The *Disability Discrimination Act 1992* and the Disability Standards for Education 2005 (the Standards) are intended to give students with disability the same rights as other students, including the right to education and training ‘on the same basis’ as students without disability.

The Standards provide a framework to ensure that students with disability can access and participate in education on the same basis as other students; and outline the obligations of school education providers under the Disability Discrimination Act. The Standards note that:

A person with a disability is able to participate in courses or programs provided by an educational institution, and use the facilities and services provided by it, *on the same basis* as a student without a disability if the person has opportunities and choices in the courses or programs and in the use of the facilities and services that are comparable with those offered to other students without disabilities (*Disability Standards for Education 2005 plus Guidance Notes*, Commonwealth of Australia, 2006, part 2.2, subsection 3).

The Standards outline an obligation for education providers to make reasonable adjustments where necessary to ensure the maximum participation of students with disability. The term ‘reasonable adjustment’ is described as a measure or action taken to assist a student with disability to participate in education on the same basis as other students. An adjustment is reasonable if it achieves this purpose while considering the student’s learning needs and balancing the interests of all parties affected, including those of the student with the disability, the education provider, staff and other students.



This applies to curriculum development as well as assessment and certification requirements. Two clauses particularly relevant to ACARA's work are:

- (a) the curriculum, teaching materials, and the assessment and certification requirements for the course or program are appropriate to the needs of the student and accessible to him or her; and
- (f) the assessment procedures and methodologies for the course or program are adapted to enable the student to demonstrate the knowledge, skills or competencies being assessed (*Disability Standards for Education 2005 plus Guidance Notes*, Commonwealth of Australia, 2006, pp 24-25).

Universal design principles

Universal design comes from incorporating guiding principles around inclusivity into the design of all items. Universal design asks item writers and reviewers to rethink some fundamental item design concepts, to contemplate equity for all kinds of users, and to consider how each item can be designed to accommodate all students' needs, such as those of the ageing or of people who don't speak the dominant language.

ACARA is working towards universal, or positive, design principles. 'Universally designed assessments are not intended to eliminate individualization, but they may reduce the need for accommodations and various alternative assessments by eliminating access barriers associated with the test themselves' (S. Thompson, C. J. Johnstone & M. L. Thurlow, *Universal design applied to large scale assessments*, Synthesis Report 44, Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes, 2002, p. 5). Items should be built using positive design principles. Where this is impossible, whether through technical constraints or by the nature of the test construct, alternative adjustments will be made available.

Requirements for item writers

ACARA requires item writers to:

1. write items that meet the intent of universal design
2. preserve the integrity of each item skill being assessed and the level of difficulty when creating alternative items, where universal design cannot be achieved.

Part 2 of this document provides specific instructions on how universal design principles are applied to item design. For writers it is recommended to embed these from the onset of item design. Part 3 of this document outlines modifications required to produce alternative items.



Guiding principles for developing accessible items

Items must comply with WCAG 2.0 AA specifications.

The visual simplicity of an item has a significant impact on the accessibility of the NAPLAN test. Enhancing visual simplicity of an item can be achieved through consistent and informed choices regarding text (font), layout, contrast, and the graphics used in an item. Note that the default platform font and layout settings have been developed to meet these principles. Item writers must consider the following principles when varying the defaults or designing image layouts:

- Text is legible and appropriately spaced.
- Layout is simple, consistent and logical.
- Contrast is sufficient.
- Where text appears in boxes or as labels, these boxes/labels should be inserted in the most logical place in the text, within the linear flow of the document or as close to the relevant section of a graphic as possible.
- Graphics are clear and legible at a single glance and only used as essential to the intent of the item.
- When using graphics, there needs to be an alternate representation of the information.

The process for accessible item design

1. Apply the recognised standards referred to in Part 2 of the Guidelines.
2. Choose item formats that suit the skill assessed and are accessible to all.
3. When the above principles have been followed but the item is still not accessible, produce an alternative item according to the type of accommodation needed.
4. Ensure all items are WCAG 2.0 AA compliant.



PART 2

Accessible item design



Visual aesthetics and appropriate typography have the potential to critically affect the way students access, perceive, understand, navigate, and interact with items.

Given the importance of visuals and text placement in eliciting appropriate responses from all students, it is vital that item writers and reviewers address the following aspects of design.



Typography of text to ensure that all text is legible and well-spaced

Font size	Font within the stem/prompt of the item is set by the system at 16 pixels. If item components are resized within the system, care should be taken to ensure that the resizing leaves all standard font with a size of at least 16 pixels. Subscript and superscript font must be at least 75% of the size of standard font.
Font weight	Semi-bold (medium) font should be used to provide good contrast with background, especially if text is being laid over a coloured background.
Word spacing	Spacing between words is consistent.
Letter spacing (tracking)	A consistent degree of increase (or sometimes decrease) of space between letters is required to ensure consistent density of text.
Leading (the vertical space between each line of text)	For legible body text that is comfortable for all to read, a general rule is that the leading value should be greater than the font size, anywhere from 1.25 to 1.5 times greater.
Text and number in tables	Text and numbers in tables and graphs uploaded appear at 16 pixels or above.
Text direction	Text is read horizontally (including on the axes of graphs).
Text and graphics justification	Text and text in graphics is left justified wherever possible.
Italicised text	While the use of italics is to be minimised, it is acceptable when an item is testing conventional use of italics, when it is used to relay direct quotations taken from the stimulus materials or when stating the name of a stimulus text.
Bold text	Bolding is used to draw attention to instructional words that are pertinent to answering particular items and item formats, for example the number of required responses for a multiple choices item is in bold - choose two ; choose all that apply.
Underlining	Underlining is to be minimised. Where underlining is required, the space between the letters and the underline is sufficient to ensure that no letters are touching the line.
Colour	Colour must not be used as the sole means of conveying meaning or content. It must meet the specifications outlined in this document.
Colour contrast	Text or diagrams, and their background, have a luminosity contrast ratio of at least 5:1.



Placement of stem and answer	Stem and answer options are visible simultaneously if possible.
Placement of icons, headings, photographs, text and captions	Each of these is to be consistently placed in the same position, in each item, where possible. Note that there needs to be a balance between accessibility and engagement.
Graph titles	The use of titles in tables and graphs is to be minimised. Wherever possible these are instead described in the item. Where used, they are to be in bold face. Titles and headings should be presented in sentence case.
Instructional graphics (charts, graphs, line drawings)	Instructional graphics can be used to provide scaffolding such as by illuminating content in a narrative or showing patterns in data in a Numeracy item.

Formatting paragraphs and line breaks

Formatting	Keyboard action
Paragraphing The system applies spacing between paragraphs. Unless extra spacing is needed, separate paragraphs only by enclosing them in paragraph tags <p> and </p>. Typing [ENTER] will automatically start a new paragraph.	ENTER
Line break A line break is inserted: <ul style="list-style-type: none">• above and below any graphic or table within an item, unless the graphic or table itself contains sufficient spacing• between the stem and prompt of an item, unless this would introduce scrolling or otherwise compromise item layout• above the response interaction, where paragraph spacing does not sufficiently separate this from the item prompt. One extra line of spacing can be applied by using a line break between paragraphs. Typing [SHIFT + ENTER] will add a line break.	SHIFT+ENTER



Requirements for all graphics

All graphics must:

- contain strong colour contrasts between adjacent areas within the graphic, between the graphic and the background, and the text and the background (see colour contrasts above). Where this cannot be achieved, as in photographs, the item will not rely on these contrasts, and the image will be captioned
- have a simple and clear layout
- maintain clarity at 200% magnification
- have strong outlines, particularly those with fill colours similar in tone or shade to the background
- have adequate spacing between any text within the graphic and graphical elements (e.g. sufficient space between the numbers used to label a number line, and the vertical dashes on the number line)
- use 1-point dark lines wherever possible
- retain resolution of graphics when enlarged to 200% while still maintaining the required file size specifications (no evidence of pixelation when enlarged to 200%)
- have no shadowing around the image or any object within the image
- use clearly distinguishable, distinctive, patterns or solid colour with maximum contrast.

It is also important that:

- images that contain detail that is not central to understanding the item (extra pictures, extra visual detail within picture), are simplified or removed
- images have sufficient distinction between edges of the image and the background to support contrast and clarity.

Graphs and tables (additional details)

- Areas within graphs are well defined (e.g. columns/bars/pie sections have solid colour, greyscale, or distinctive patterning and outlines, and are separated where needed with white space).
- Statistical graphs have at least 1pt dark axis and gridlines.
- Lines in tables are min 1pt in 100% black.
- Columns are clearly separated; a 1pt vertical line is used to separate columns.
- Spacing within cells of a table is sufficient to ensure the lines of the borders do not interfere with the contents of the table cells.



Photographs and illustrations (additional details)

- Photographs with little distinction between tonal value of colours are not used.
- All photographs must be supplied as Adobe Photoshop CS5 TIFF format files.
- All photographs must be supplied at 300 dpi at 100% or greater of the final size to be used.

Domain-specific guidelines

Numeracy

- Algebraic variables should be rendered with italicised text.
- Special characters and arithmetic symbols (e.g. addition and division symbols, decimal points, fractions) are best rendered using MathML or HTML Unicode abbreviations.
- One character space is added before and after algebraic variables, expressions, equations and inequalities. MathML will manage this spacing automatically within an expression.
- Within a map, grid or coordinate plane, all lines, such as those used in function graphs, are 1pt black or dark grey. Where these lines are not black, they should be at least 75% dark.
- Points on a graph should be sufficiently large to be easily distinguishable from the background.
- Colour must not be used as the sole means of conveying meaning or content. Where coloured sections are used, they must be labelled clearly.
- The backgrounds for all resources (images, graphs, maps) within an item must be transparent.
- Images that are not pertinent to the mathematics of an item should not be used.
- Scrolling should be avoided wherever possible. In determining whether vertical scrolling will be required, the space required for the audio bar should be considered.
- A line break should be inserted above and below any graphic or table, above the response element/answer box and between the stem and the prompt/question for an item. Exceptions may include when an image contains empty space at its border.

Reading and Writing

Stimulus and Writing prompt texts

- Minimum font size for all stimulus texts created outside of the system is 16px. When font increases, so too does the leading.
- Where fonts other than Arial are used, they are plain, clear, easy to read sans serif fonts and clear serif typefaces (e.g. Tahoma, Helvetica). Stylised, decorative or cursive fonts are not used (e.g. Pristina, Chiller, Brush Script and Castellar). Fonts that have clear letterforms are used.



- Some letters will need to be manually kerned if they are touching.
- Font is 100% black or at least 75% dark; red font is not used.
- Variations in font type, size and colour are minimised within each text.
- Titles are in a clear font as above; italics/script fonts are not used.
- Parts of the letter that appear above (ascenders) or below (descenders) the main body of the letter are distinguishable and not touching (e.g. the vertical bar in a lower-case h or the tail of a lower-case g).
- Words are kept together on the same line; hyphenation is not used across lines.
- Footnote font size is consistent with the font size of the rest of the text. Footnotes to be written as, for example, 'See Note One'. Footnotes are not applicable to Writing prompts.
- Caption font size is consistent with the font size of the stimulus text. Captions are placed above images/graphics. Captions are not applicable to Writing prompt texts.
- Where a graphic adds meaning to the text, that meaning should be expressed in the caption.
- Contrast between text and background is to be maximised by using high contrast colours. The following adjacent colour combinations are not used: red-green, black-red, green-yellow, blue-yellow (including blue-beige).
- Inset images should not interfere with line lengths. To avoid this, the image size is reduced or the image relocated on the page.
- Whole page borders or text section borders are used to assist tracking when texts are magnified or to separate sections of text.
- Decorative graphics (e.g. borders) may be used to divide sections of text.
- Long, narrow presentations of text minimise horizontal scrolling when expanded and magnified above 100% (within the system).
- Column layouts can be used to assist tracking. While there is no specification for the width of the guttering it always needs to be wide enough for each column to be distinct.
- Stimulus texts created in the system must have line breaks set (by HTML code) for text wrapping and line length considerations (as displayed across multiple devices).

Conventions of language

The guidelines for the development of Conventions of language items are covered by the guiding principles. There are no domain-specific guidelines for this domain.



PART 3

Modifications required for alternative items



An alternative item is used when the universal item design specifications in Part 2 cannot be met.



Alternative items aim to maintain the integrity of the content and difficulty of the original item. Where a modification cannot be made to create a suitable alternative of the original item, a substitute item of similar difficulty will be required. The domain-specific item development guidelines will specify whether the alternative item will be developed along with the original, or whether ACARA will develop it at a later date.

Where a disability impacts on access to the tests, reasonable adjustments may be granted to facilitate access to all or some of the tests.

Alternative format test options

There are several alternative formats available for tests. From 2019, these comprise audio and visual alternative formats, as well as alternative formats that present content in a selection of colour themes. Where a student requires alternative items in one or more of these categories, the platform will automatically substitute an alternative item or configure the test player theme according to the corresponding Disability Adjustment Code (DAC).

Students may use the same alternative format for all tests, or they may access different alternative formats for each test.

Alternative format tests description	Students who may require these tests	Modifications required for alternative items
AIA: Audio alternative questions Replaces audio files for spelling with text passages for proofreading.	Students who have difficulty hearing audio content through headphones. Relevant to Conventions of language test.	Replace spelling audio dictation items with proofreading alternatives.



Alternative format tests description	Students who may require these tests	Modifications required for alternative items
AIV: Visual alternative questions Simplifies, enlarges or replaces images, including text within images, for easier viewing.	Students who have difficulty accessing visual content online or normally use large print paper NAPLAN tests.	Replace complex diagrams with simpler visual alternatives, where universal design is insufficient. Replace items that require reading fine graduations on ruler and protractor tools with simpler measurement alternatives. Replace Reading stimuli with alternatives where universal design is insufficient. Replace Reading items that assess viewing with alternatives that assess different reading skills.
BNW – Black text with white background	Students who normally use black and white print format copied onto coloured paper or coloured overlays. This code can also be used to provide a white text with black background test, where the student uses their system settings to invert the screen.	Background colours removed from item or stimulus HTML.
BNB – Black text with blue background	Students who normally use black and white print format copied onto coloured paper or coloured overlays.	RGB: 150, 173, 252 Background colours removed from item or stimulus HTML.
BNL – Black text with lilac background	Students who normally use black and white print format copied onto coloured paper or coloured overlays.	RGB: 185, 135, 219 Background colours removed from item or stimulus HTML.
BNG – Black text with green background	Students who normally use black and white print format copied onto coloured paper or coloured overlays.	RGB: 168, 242, 154 Background colours removed from item or stimulus HTML.
BNY – Black text with yellow background	Students who normally use black and white print format copied onto coloured paper or coloured overlays.	RGB: 248, 253, 137 Background colours removed from item or stimulus HTML.



Appendix 1

Accessible item design checklist

- ☐ A simple, clear font has been used.
- ☐ Text is visually clear at 200% magnification.
- ☐ All text is of an appropriate size.
- ☐ Use of block capitals, italics and underlining is limited.
- ☐ Text is left aligned and set horizontally.
- ☐ Text is not condensed or stretched.
- ☐ Space between lines and paragraphs is adequate.
- ☐ There is good contrast between text and background.
- ☐ Layout is simple, consistent and logical.
- ☐ There is adequate space or a vertical line between columns.
- ☐ Tables have visible borders, with adequate space between text and border.
- ☐ Text boxes and images are easily located and do not interfere with the flow of text.
- ☐ Graphics are clear.
- ☐ Captions are placed above the image and left justified.
- ☐ No information is conveyed solely on graphics or colour.
- ☐ Text within graphics is clear, consistent and the same size as the main text.

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