BOOKS without barriers

A practical guide to inclusive publishing

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AUSTRALIANPUBLISHERSASSOCIATION

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Foreword

Books without barriers, a new guide to creating accessible books by the Institute of Professional Editors (IPEd), is a welcome and timely resource for the whole publishing industry. The Australian Publishers Association and editors in Australia and Aotearoa New Zealand proudly support this initiative.

Publishers understand the importance of ensuring that everyone has equal access to reading materials, whether for information or pleasure. However, many texts are still partly or wholly inaccessible to people with disability, making it difficult or impossible for some readers to engage with them. Everyone who contributes to the process of creating publications therefore has a responsibility to develop and share skills and understandings of best practice in producing accessible materials.

It is estimated that almost 5 million people in Australia live with print disability. Catering for this substantial and underserviced market is likely to engage new audiences for our books. It is also a key requirement for educational publishers and others affected by local digital procurement standards, as well as publishers whose markets include countries covered by international legislation such as the European Accessibility Act.

While a range of information is available online that covers aspects of accessibility, it can be difficult and time-consuming to sift through the literature. *Books without barriers* brings together a wealth of research and advice relevant to book publishing in one convenient resource. It begins by outlining the diverse ways in which people with disability read. People can be easily excluded from enjoying our books if we don't fully understand their requirements. Considering the needs of the audience is therefore a critical first step in ensuring equal participation and inclusion in reading.

Nowadays, content can be accessed via an expanding range of assistive technologies, using the senses of hearing, touch and vision. However, access is possible only if these ways of reading are enabled rather than disabled at every stage of the publishing process. The guide includes helpful advice on the managerial aspects of inclusive publishing: policy, planning, what to include in author contracts and vendor briefs, and how to embed accessibility efficiently throughout the publishing workflow. In short, it provides a comprehensive

overview of how to write, edit, illustrate, design and publish materials with accessibility in mind.

Irrespective of your part in the publishing process, *Books without barriers* will help you understand the importance of accessibility and equip you with the knowledge and skills needed to create and edit accessible publications. Publishers and editors in Australia and Aotearoa New Zealand are excited to embrace this positive change. We hope that you find this guide a valuable resource in our collective efforts to make the world more inclusive.

Ruth Davies
Chair, Institute of Professional Editors Board

Julie Burland
President, Australian Publishers Association

Introduction

The accessibility of a publication depends on how suitable and easily adaptable it is to the different ways in which people read. Publications that meet the needs of people with print disability are inclusive because they offer an equitable reading experience to all readers, irrespective of how the person accesses the content.

Print disability[1] occurs as a result of the interaction between people living with temporary or permanent health conditions and the barriers to reading they may experience when content is made available in print form only. Print disability can be:

- visual (including blindness, low vision and medical conditions such as macular degeneration)
- perceptual or related to learning difficulties (caused by conditions such as dyslexia and autistic spectrum disorder)
- physical (for example, conditions that make it difficult to manipulate and interact with printed materials or to focus or move the eyes).

People with print disability may need to access content using assistive technologies. An assistive technology is any equipment, device or system that supports the functioning and independence of people with disability. Assistive technologies for reading include print magnifiers, screen readers, braille, large print and talking books. (Refer to the chapter Know your audience for further information on the ways in which people with print disability read.)

Everyone should be able to engage fully with the stories and information we create, irrespective of the sense(s) – vision, hearing and/or touch – used to read them. We therefore need to know how to prepare text, images and file formats in a way that ensures auditory or tactile readers, or people who read visually but have a condition that impairs their vision, don't miss out on key information.

Transforming the way content is written and produced is also an investment in the wellbeing and prosperity of writers, illustrators and their publishers. There is a competitive advantage in ensuring books can be read through all sensory channels, including formats such as large print, ebooks and audio.

1 The term "print disabled" was coined by George Kersher of the DAISY Foundation.

Making content accessible to people with print disability will allow more readers of all ages to find, purchase and experience the work of writers and illustrators from Australia and Aotearoa New Zealand – whether for personal enjoyment, information, cultural enrichment or formal education.

Creating "born-accessible" digital books

Born-accessible books are digital publications that are designed to be accessible from inception. In the past, accessibility was often considered as an afterthought. Producing born-accessible digital content redresses this imbalance. Accessibility is considered at every stage of the publishing workflow, from concept to output, rather than accessibility features being retrofitted after publication. Retrofitting for accessibility delays the production of accessible formats, and makes them expensive to produce and to buy. Alternative formats such as braille can be generated more efficiently from born-accessible digital formats.

Incorporating accessibility across the publishing workflow can therefore offer cost efficiencies for both publishers and readers. Creating born-accessible publications allows publishers to spread the costs over the whole production process. Alternative formats can then be offered to readers at the same time as mainstream formats, and at an affordable price, rather than people with disability having to wait for their format of choice and pay a higher price for it when it finally becomes available.

Accessibility best practice also fosters excellence in publishing that can result in better books for everyone. Some of the suggestions in the section Considerations for poetry in the "Digital formats" chapter, for example, could be used to enhance content for readers in other genres too. And as discussed in the chapter Design, addressing accessibility issues such as font size and layout can improve the reading experience for users of both digital and print formats.

Background to the guide

In 2014, Australia signed the Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired or Otherwise Print Disabled. The treaty recognises, as does Australian disability legislation, that people living with disability have the same rights and needs as everyone else to participate in society. The World Intellectual Property Organization (WIPO) anticipates that providing increased access to information and ideas through books and other reading materials will allow people with print disability greater access to

education and opportunities for professional development, cultural participation and social inclusion.

Books without barriers builds on *Inclusive publishing in Australia: an introductory guide*. Published by the Australian Inclusive Publishing Initiative in 2019, the introductory guide explains in more detail the business, social and legal reasons for creating accessible publications.

Some of the information in *Books without barriers* has been gathered from our own research with readers, disability agencies, alternative format providers and publishers. The rest is from other published sources, both local and international. These sources are listed at the end of each chapter.

One key source is the Web Content Accessibility Guidelines (WCAG), which is the international standard for digital publications. Although WCAG was developed primarily for web developers, and is designed to address web accessibility, many of its criteria are applicable to other forms of digital publishing too, including ebooks. WCAG's core principles (known as the POUR principles) are that content published digitally should be:

- perceivable (for example, by ensuring that the information conveyed in an image can be perceived by people who cannot see it)
- operable (such as using correctly structured headings and contents lists to ensure the text can be navigated easily)
- understandable (for example, not relying on purely visual language when giving instructions or providing cross-references)
- robust (able to be interpreted by digital assistive technologies, such as refreshable braille and screen readers).

Books without barriers builds on these principles while also addressing other issues that affect book publishing, including advice on:

- accessibility considerations for author contracts, budgets and project plans
- accessibility briefs for contributors
- issues for punctuation when text is transcribed into braille
- complex textbooks such as mathematics and chemistry
- multisensory language and tactile elements that can help distinguish ideas in books for young children
- design improvements to printed texts for readers with conditions such as low vision and colour blindness
- accessibility metadata, so readers can find the book and decide whether they want to read it.

Who is the guide for?

Books without barriers is written and produced by the Institute of Professional Editors, with the support of key industry bodies the Copyright Agency and the Australian Publishers Association. Our aim in writing is to collect as much advice on accessibility specific to book publishing as possible in one place, so that publishers and contributors in Australia and Aotearoa New Zealand can avoid lengthy searches for information.

We hope this resource will help make the process of creating accessible publications easier to understand for all those involved, including writers, editors, proofreaders, illustrators, designers, typesetters and publishers. Not all sections are relevant to all roles, and some contributors play more than one role in the publication process. To help you find information relevant to your own work, the guide is broken down into parts that are roughly parallel to stages in the publishing workflow: planning, content development, drafting image descriptions, and production.

The guide offers suggestions on how accessibility barriers can be removed without loss of meaning or clarity of expression. As well as providing practical advice for each stage of the publishing workflow, we have included background information that discusses the accessibility issues being addressed. There are few one-size-fits-all solutions. Context is key, as each genre, publisher and publication has different requirements, challenges and methods of working. The explanations provided in this guide are designed to help each contributor and publishing team choose options suited to their needs, or even develop new solutions of their own.

We acknowledge that our suggestions respond to some, but not all, of the disadvantages that publishing has traditionally presented to readers with disability. Research into accessibility is ongoing, and we must continue to listen for and respond to disadvantages that have been missed. The mechanisms we suggest in this guide are therefore open to evolution as technology advances and the publishing industry uncovers further areas for improvement.

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Part 1
Planning for inclusive publishing

Chapter 1
Know your audience

A first step in making books accessible is to consider the different ways in which they may be read, and the formats and technologies available to support readers with print disability. Understanding how people use their senses to access material makes it easier to identify the barriers they may experience if we don't work with their needs in mind. It also helps us develop solutions that can improve the reading experience for everyone.

Hearing

One of the senses people with print disability may use to read is hearing. Options include:

- screen readers
- text-to-speech software
- digital recordings.

Screen readers and text-to-speech software

Digital content can be translated into synthetic speech and read out loud by inclusive or reading technologies such as screen readers or text-to-speech software. Screen readers access everything on the screen, whereas text-to-speech software is used mainly for reading documents.

These technologies allow users to navigate through content and adapt it to their needs. Features may include the ability to change the language or voice dialect, have words highlighted as they are read aloud, skip through content, and increase or decrease the speed of speech. Screen readers can also guide people with low or no vision as they navigate through their computer or device.

Most smartphones, tablets and computers have built-in screen readers. Examples include:

- Narrator in Windows
- TalkBack for Android devices
- Speak Selection, Speak Screen and VoiceOver for iOS devices.

Other screen readers can be downloaded, such as JAWS (Job Access With Speech) and NVDA (Non Visual Desktop Access) for Windows. Text-to-speech software includes the Read Aloud function in Microsoft Word and Adobe Acrobat.

If you want to get a rough idea of what someone listening to your text might experience when using text-to-speech software, try activating the Read Aloud function in a document you are working on. Close your eyes and notice what is clear and what could be confusing if you can't see the page, including elements such as images and tables.

Digital recordings

Digital recordings include audiobooks and talking books. They can be accessed on standard devices such as smartphones and computers, or played on specialist portable devices such as DAISY (Digital Accessible Information System) players. Content may be read by human narrators, particularly for recreational reading, or digital voices. Some digital voices sound more human than those commonly encountered using reading technologies.

To be accessible, an audiobook should offer readers a similar level of information and flexibility to that enjoyed by readers of printed books. This includes the ability to navigate by chapter, section and page, read or skip supplementary information such as footnotes, and listen to text alternatives for non-text information such as images.

Audiobooks and reading technologies (such as text-to-speech for ebooks) are useful for many people, not only those with low or no vision.

- They can assist readers with perceptual difficulties, who may find print tiring to read or who will benefit from hearing difficult words read out to them.
- Some readers with learning disabilities find that the intonation and inflection of a human voice improves their comprehension of a text.
- Readers with physical disabilities may use audio technologies to read if they cannot hold or manipulate a book.
- Audiobooks are increasingly popular with people who want to listen because they are doing something else, are tired at the end of the day, or simply enjoy having a book read to them.

Touch

Another sense people with print disability may use to read is touch, using tactual technologies such as braille, raised printing and three-dimensional printing.

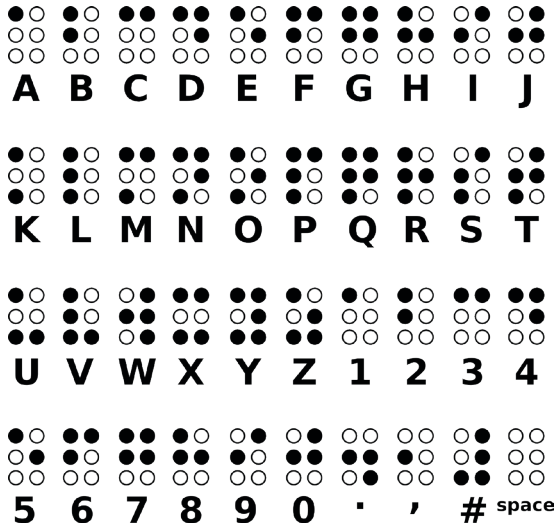
Braille

The braille system is based on cells of 6 dots for each item: letters, numbers, symbols, punctuation, and so on (Figure 1.1).

Because there are only so many possible combinations of dots, many cells have shared meanings. For example, the sign for the letter "a" is the same as for the number one (Figure 1.2). To denote the difference between a lowercase and uppercase letter "a", and between the letter and the number, the uppercase and the number are preceded by a symbol, which acts as a tag. There are also symbols to signify elements such as format changes for italics.

Figure 1.3 illustrates what the phrase, "accessibility in mind" looks like in braille (Pharma Braille Unicode).

Figure 1.1: A braille alphabet



Source: Pixabay

Figure 1.2: The braille cells for an uppercase "A", lower case "a" and the number one (1)

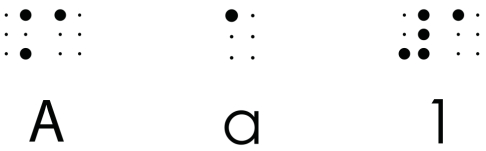


Figure 1.3: A sample of text in braille



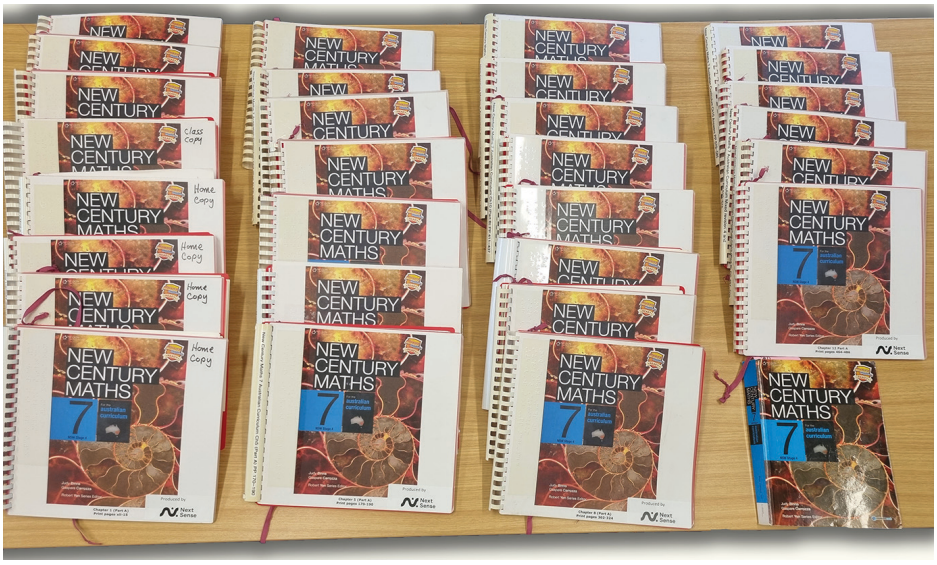
Braille is generated by a translation process. Specialised software translates the text into braille, and embossers then punch the dots onto thick card. The result ends up being much bulkier than the equivalent printed book because each cell needs to be big enough to be distinguished by touch, and more information is needed to identify capital letters and formatting.

For example, the 12-chapter maths textbook shown in the bottom right-hand corner of Figure 1.4 is approximately 600 printed pages long. By comparison, the braille version is over a thousand braille pages and includes 540 braille diagrams. Because of its size, the braille transcript has to be split into 29 volumes, each of which are about the same thickness as a single copy of the printed book.

In print-and-braille (also known as Twin Vision or Dual Media) books (Figure 1.5), the braille is placed next to the print text and illustrations in a standard print book. This provides a key early-learning opportunity for children to experience shared reading. The combined text and braille can be read by both sight and touch, allowing the child to read along with an adult if they are old enough to do so.

Refreshable braille displays (Figure 1.6) provide an alternative to printed braille. The display is a tactile electronic device, driven by a screen reader, that can be attached to a computer or connected by Bluetooth to some smartphones. Braille displays generally consist of between 12 and 80 braille cells. Each cell has 6 or 8 nylon pins that are electronically controlled to move up and down,

Figure 1.4: *New century maths* in braille and print formats



Source: Photograph by NextSense.

Figure 1.5: A Twin Vision edition of picture book, *Spotty Dotty*



Source: Katherine Duncan (2019), *Spotty Dotty*, Gannadoo.

Figure 1.6: A refreshable braille display



Source: Photograph by Janet Douglas.

displaying a braille version of the characters that appear on the screen. Because only a limited number of characters (up to 80) are shown at one time, the displays have controls that allow the user to move around the computer screen.

While refreshable braille is useful, printed braille is better for some types of publications, such as technical material, as it allows the reader to refer back to an earlier section quickly. Refreshable braille displays are also expensive, which can be a barrier for some people.

Braille is time-consuming and expensive to produce, especially for complex material such as mathematics and science. However, exposure to braille from

an early age is critical to the education of children who are blind. It teaches key literacy skills, such as the correct use of grammar and punctuation, which cannot be learned by listening to the text being read. The ability to read braille is also an important employment skill for adults who are blind, and the ability to read and write remains crucial to professional success.

Three-dimensional printing

Raised printing enables readers to feel the contours of a line drawing. Tactile maps, for example, can be printed using a mixture of thermography for the lines and braille for the labels, or with three-dimensional printers (Figure 1.7).

Three-dimensional printing can also produce touchable versions of objects or even characters in stories. For example, NextSense has printed a 3D model of an ant for the picture book in Figure 1.8, so its students can experience how the ants are illustrated in the book.

If graphic elements need to be distinguished from one another, consider how they might be differentiated through touch rather than just colour. For example, if a children's story features blue and green balls, tactile teaching aids cannot indicate the difference between them because colour cannot be perceived by

Figure 1.7: **A Touch Mapper tactile map in use**



Source: **Photograph by Samuli Kärkkäinen, the creator of Touch Mapper. Wikimedia Commons, Creative Commons Attribution 3.0 Unported license.**

Figure 1.8: Three-dimensional printed character to accompany a braille edition of the picture book, *Ants!*



Source: Photograph by NextSense.

touch. However, if the blue ball also features a zigzag pattern and the green ball is spotted, a raised or three-dimensional print of the objects will be meaningful to children who cannot see them as well as to those who can.

Vision

A third way in which people with print disability read is through sight, using printed or digital formats.

In this section we will consider the needs of people with physical disabilities, low vision, colour blindness and dyslexia (although this list is by no means exhaustive). Irrespective of disability, all readers should be able to change the typeface, type size and colour of digital content based on their own personal requirements.

Physical disabilities and reading

Physical disabilities that may affect a person's ability to read standard print include conditions that cause muscular weakness or spasms, mobility issues (such as arthritis, spinal cord injury and cerebral palsy), chronic fatigue syndrome and

seizures. Such conditions may make it difficult or impossible for the reader to hold, manipulate or interact with a printed book.

Ebooks read using e-reader devices, tablets, computers, laptops and phones can make visual reading more accessible for people with physical disabilities. This is because they are easier to manipulate than print books: users can scroll through the content using scroll keys or even voice-controlled manipulation, rather than having to turn pages.

E-readers are generally lighter to hold, putting less stress on muscles and joints. They can be laid flat or propped up for reading, without closing or having pages flap around. Electronic devices also allow users to browse virtual bookshelves at their leisure rather than relying on other people to help them find and reach for a book of their choice on a physical bookstore or library shelf. Moreover, the gentle backlighting on some e-readers can be helpful to users with migraines and other neurological symptoms.

Low vision and reading

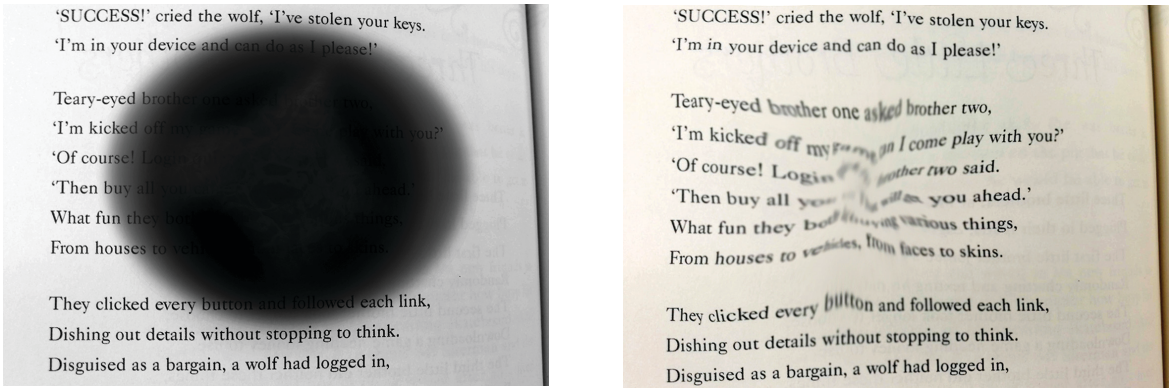
The most common conditions in Australia that cause low vision are uncorrected refractive error, age-related macular degeneration (AMD), cataract, glaucoma and diabetic retinopathy:

- Refractive errors such as myopia and astigmatism occur when the shape of the eye prevents light from focusing correctly on the retina, causing blurry or unclear vision, eye strain and problems with focusing.
- AMD is generally caused by fluid leaking into the macula from abnormal blood vessels, causing a blurry area or blind spot in the central vision (Figure 1.9a).
- Cataracts are clouding of the clear lens in one or both eyes, causing blurring of the whole field of vision (Figure 1.9b).
- Glaucoma is a type of disease that causes intraocular pressure that can damage the optic nerve, leading to a gradual loss of peripheral vision (Figure 1.9c) and eventually loss of sight.
- Diabetic retinopathy damages blood vessels in the retina, causing swelling and bleeding that leads to dark spots covering the visual field (Figure 1.9d).

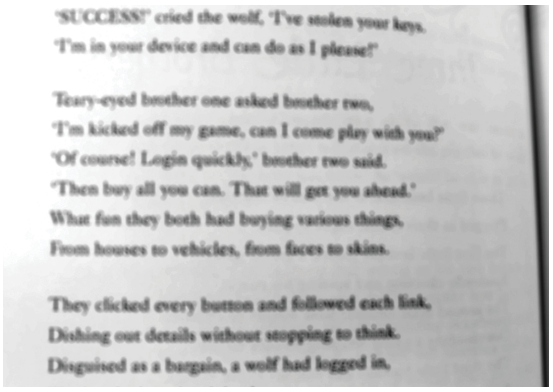
Other conditions that can cause low vision include albinism, nystagmus (which causes involuntary flickering of the eyes), retinitis pigmentosa (which causes degeneration of cells in the retina) and stroke.

Figure 1.9: How text may appear to readers with low vision

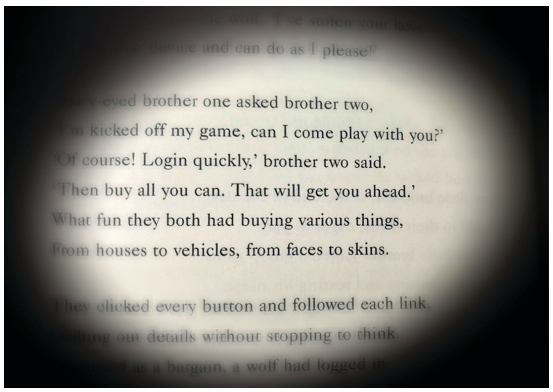
(a) Age-related macular degeneration (AMD)



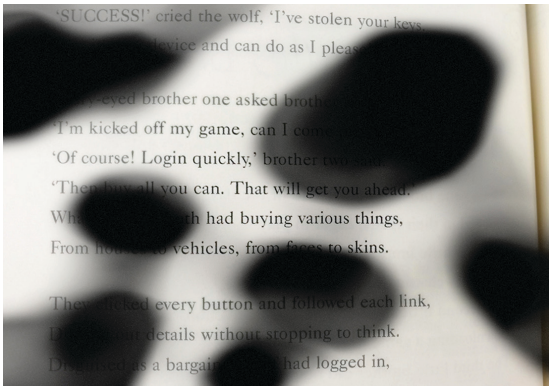
(b) Cataracts



(c) Glaucoma



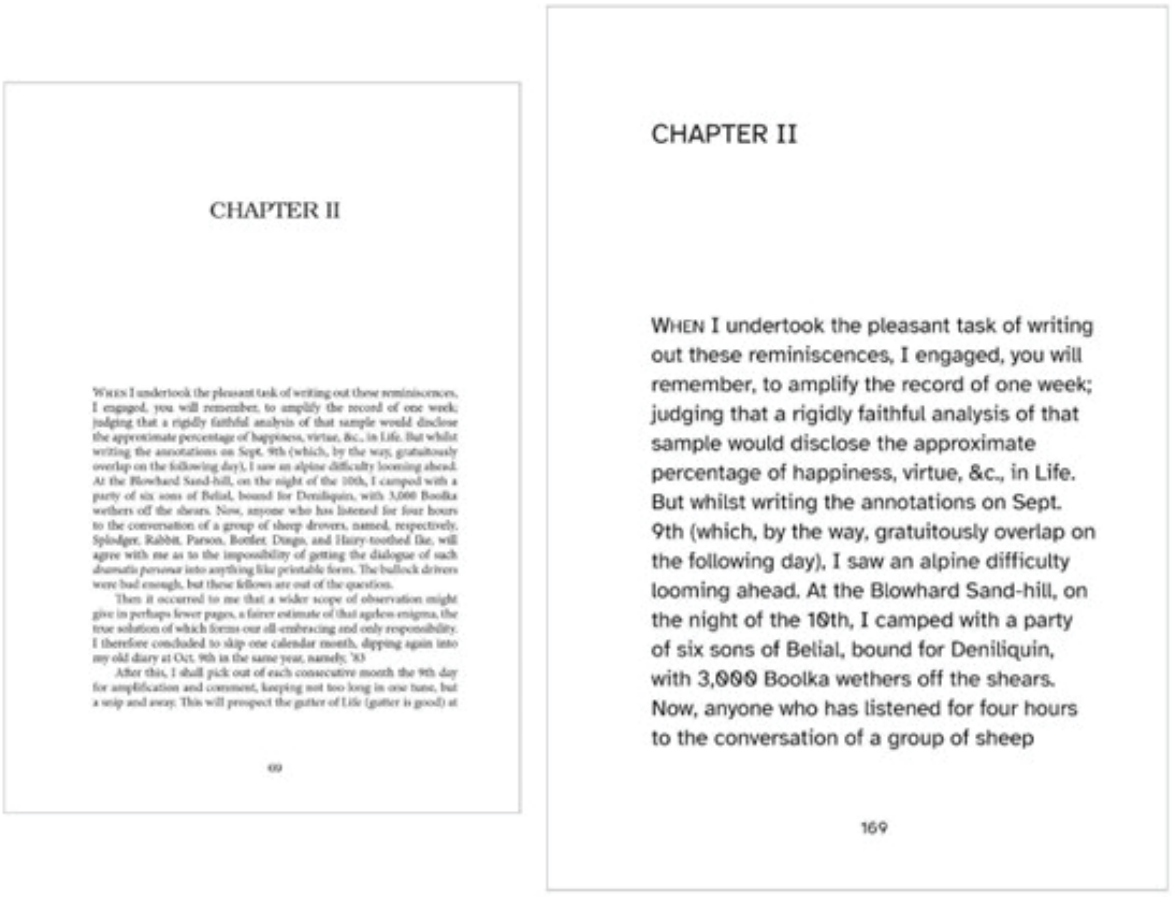
(d) Diabetic retinopathy



One reading option for people with low vision is large print (although large-print editions are not always available). To be considered a large-print edition, a book must be set in at least 16-point type, and preferably 18 to 20 point or larger. The content of a large-print book is the same as in the standard edition, but there are more pages in the book because of the increased type size. In Figure 1.10, for example, the standard text on the left is set in Minion Pro 10.5 point, page size 210 × 148 millimetres. Its large-print equivalent on the right is set in Atkinson Hyperlegible 18 point, page size 254 × 178 millimetres. It contains less than half the content of the standard text.

Large-print books are usually marked as such (Figure 1.11).

Figure 1.10: **A page of standard text and its large-print equivalent**



Source: Extract from Joseph Furphy (2021), *Life: being certain extracts from the diary*, Sydney University Press.

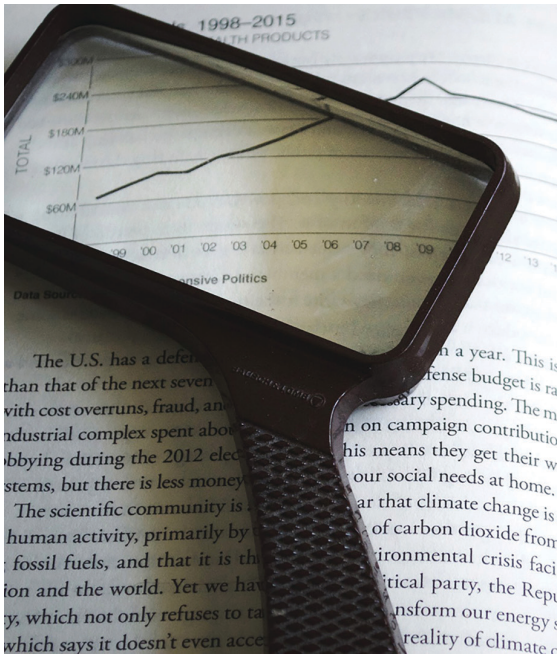
Figure 1.11: A shelf of large-print books



Readers with low vision may also choose to use print magnifiers for printed text, moving them manually across the page to enlarge the words and images. These tools include:

- hand-held magnifiers (Figure 1.12), which the reader focuses by bringing the magnifier closer to or further from the page
- stand magnifiers, which sit on the page and may have an inbuilt light source
- visulette and strip magnifiers, which are thick pieces of magnifying glass that sit on the page and are slid up and down by the user.

Figure 1.12: A hand-held magnifier



Source: Pixabay.

Screen magnifiers can help people with low vision access digital content, increasing the size of the onscreen material by up to 64 times. While most devices now have in-built magnifying software, such as Windows Magnifier, some users may require specialist programs with increased functionality and magnification levels.

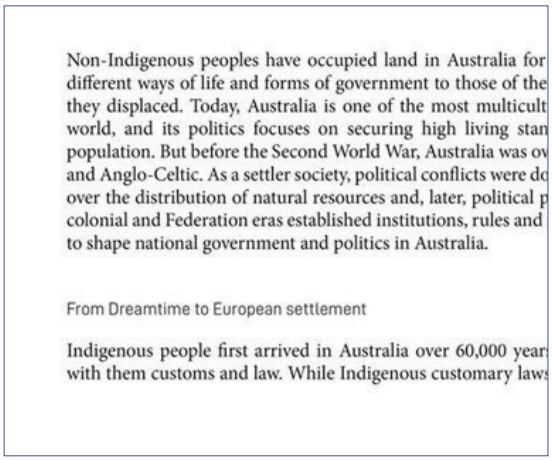
Fixed-layout digital formats such as PDFs are extremely difficult to read using screen magnification. In reflowable formats such as EPUB on the other hand,

Figure 1.13: Comparison of a page of text in reflowable and fixed formats

(a) Reflowable format: the whole row of text is visible at the same time.



(b) Fixed format: the end of each row overflows past the edge of the viewable area, so the reader needs to scroll across to read it.



if the font is enlarged, the text automatically reflows without breaking up the lines (Figure 1.13). This means readers can follow the text without constantly scrolling from side to side across the line, which can quickly become exhausting. Another benefit of reflowable digital text is the ability to change the font, adjust the colour contrast, and switch to text-to-speech when visual reading becomes too tiring.

Colour blindness and reading

Colour blindness affects approximately 1 in 12 men and 1 in 200 women. Despite its name, it is unusual for someone to be able to see no colour at all (monochromacy: Figure 1.14e). For this reason, colour blindness is also sometimes described as "colour vision deficiency". Most people with colour blindness are able to see as clearly as everyone else, but they can't fully perceive red, green and/or blue light, so they are unable to distinguish between certain colours.

The most common form of colour blindness is known as "red-green colour blindness" (deuteranopia and protanopia: Figures 1.14b and 1.14c). People with this form mix up not only red and green but also colours that have some red or green in them. For example, dark red may appear black, or if it's an orangey-red it may appear dim yellow. Purple may not be distinguishable from blue because

Figure 1.14: A platter of carrots and celery as it may appear to different readers, and the range of perceivable colours interpreted by the eye



(a) Readers with no form of colour blindness are able to interpret 7 different colour hues using 3 light-sensitive cones: long, medium and short.



(b) Readers with deuteranopia, also known as green colour-blindness, are missing medium wavelength sensitivity green cones. As a result, they are able to interpret only 2 or 3 colour hues across the full colour spectrum.



(c) Readers with protanopia are missing their long wavelength cones. They are less sensitive to red light. The severity of the condition depends on the strength of the remaining 2 cones.

Figure 1.14: continued



(d) Readers with tritanopia confuse blue with green and yellow with violet as a result of a missing short wavelength cone.



(e) Readers with achromatopsia interpret light only in shades of grey.

the red element in purple isn't perceived, and some shades of orange and green can look yellow.

Another, less common type of colour blindness is blue-yellow deficiency (tritanopia: Figure 1.14d), which makes it difficult to differentiate between yellow and red and between blue and green. People with this form may also have difficulty with secondary colours; for example, confusing purple and red.

Coloured illustrations are useful and can add to the visual appeal of the text. However, consider how key information could be differentiated in other ways too, such as by shapes and labelling, to make images inclusive (refer to the chapter Design).

Dyslexia and reading

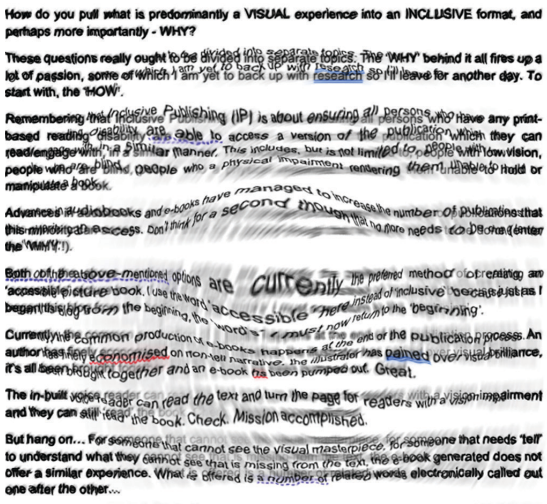
Dyslexia is a learning disability that affects a person's ability to convert the symbols of letters into sounds, and to then put the sounds in the right order to form words. Approximately 10 per cent of people have dyslexia.

Dyslexia, and the visual stress it creates, can result in very different reading experiences for different individuals. Text may move and become blurry, and entire lines may shift, ripple or even swirl (Figures 1.15a to 1.15c).

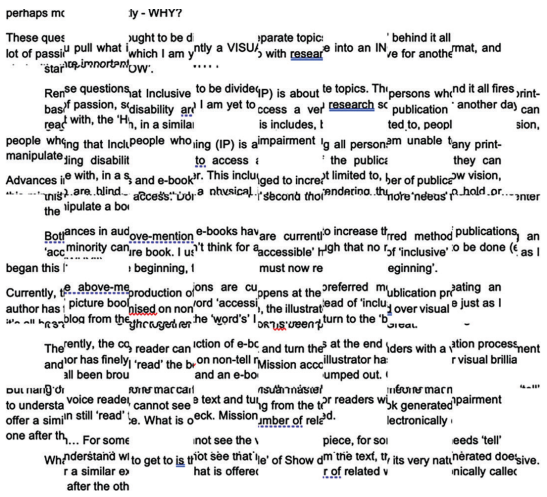
People with dyslexia may find text easier to read if it is set in, or can be digitally adjusted to provide, larger fonts, roman type, and shorter lines with greater line spacing on lightly coloured backgrounds. They may also use tools such as screen-masking software to minimise distractions and avoid line skipping (Figure 1.16).

Several typefaces have been designed specifically for people with dyslexia. Further information on dyslexia-friendly typefaces, including examples, is provided in the chapter Design.

Figure 1.15: A page of text as it may appear to different readers with dyslexia

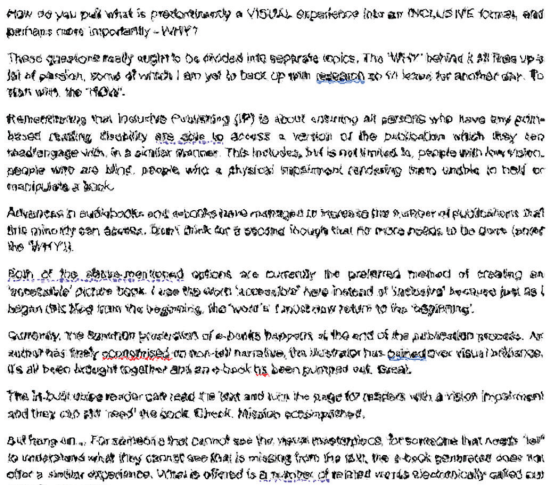


(a) The text may swirl and move in ripples on the page.



(b) Letters or even whole words may become displaced and out of alignment.

Figure 1.15: continued



(c) Text and words may move and become completely unrecognisable.

Figure 1.16: Screen-masking software highlighting a single paragraph of text to eliminate distraction



Flexibility is key

Many readers use more than one sense or format for reading. They may switch from one to another based on their needs, or use a combination of senses when reading. For example:

- Readers may alternate between visual and audio formats, such as when they experience fatigue from reading on-screen for too long.
- Readers may need both words and visual cues, such as colour and images, to navigate through and comprehend text.
- Readers may use different formats, depending on the type of content they need to access and the context of reading. For example, they may use audiobooks for pleasure but e-text, text-to-speech or braille for professional or study purposes.
- Students may listen to an audio file at the same time as reading the written text, to aid comprehension and help them stay focused.
- People who are blind may switch from audio to braille, using software to convert digital text into braille that they access through a refreshable display (such as when reading in another language).
- Users of digital talking books in the DAISY format may access text files as well as audio files if these are included in the book. The text can be displayed on-screen using magnification software, accessed through a refreshable braille display or sent to a braille embosser.
- Students with or without disability, especially non-visual learners, may benefit from having an audio version of both textual and non-textual content, including features such as image descriptions, to help them process information.
- Being able to access content in a range of ways is better for all readers, as situational and temporary limitations are very common. A situational limitation is where a person's ability to hear, see, use their hands, concentrate or understand instructions is limited by their situation; for example due to poor lighting. A temporary limitation is where a person's functional ability is limited by a temporary physical condition such as a broken arm.

A key consideration is therefore to allow the reader as much flexibility as possible, including in their choice of format. To do so, we need to consider publishing books in different formats at the same time, supporting alternative format providers by offering them appropriate source files in a timely manner,

and building options into digital books that allow readers to personalise their reading experience as much as possible.

Accessible language

The capacity of readers to engage with text is affected by their literacy. As book publishers create books for specific audiences with different levels of literacy, the reading level should be set at a suitable level for the content and the audience. For example, children's reading books are published to a predetermined reading age, and literary fiction and scholarly monographs assume a relatively high literacy level. Whatever the reading age, the books should be released in accessible formats.

For complex works, there is scope for creating supplemental content written in accessible language. Several scientific journals have started releasing articles with summaries written in more accessible language or provided in videos. This supports the Web Content Accessibility Guidelines (WCAG) requirement that "content should be written as clearly and simply as possible", and if this is not possible, then "supplemental content is needed".

Children's books publishers may also consider creating "high interest low reading level" (high-low or hi-lo) books that are designed for struggling or reluctant readers. These books focus on age-appropriate subject matter but are written in language suitable to a comparatively low reading level, with simple vocabulary and syntax. High-low books can help students build their knowledge, vocabulary and reading fluency, and promote an interest in reading.

The needs of book publishers contrasts with that of many governments and public institutions in their online content, such as forms or information about services. Governments are required to publish such content in plain language so it is available to as wide an audience as possible, which is to a reading level of early high school in Australia and Aotearoa New Zealand.

The principles of plain language or Easy Language have been discussed extensively elsewhere, so they will not be covered in this guide. For more information, see:

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- Australian Government Style Manual. Easy Read, Literacy and access and Clear language and writing style

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- Myers, J G (2008). *Plain language in government writing: a step-by-step guide*, 1st edition, Management Concepts, Vienna, Virginia.
- Plain English Foundation

Resources

AbilityNet, An introduction to screen readers
American Council of the Blind, Large print guidelines
American Foundation for the Blind, What is braille?
Australian Dyslexia Association, What is dyslexia?
Colblindor, Color blindness – Learn all about it
DAISY Consortium webinar, Ways people with print disabilities read
Microsoft, Listen to your Word documents
NV Access, NVDA 2022 (screen reader available for free download)
Vision Australia, Understanding eye conditions
WebAIM, How screen readers read content

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Vision Australia (n.d.). Diabetic retinopathy.
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Vision Australia (n.d.). Glaucoma.
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Chapter 2
Accessibility policies for publishers

To make your organisation's publishing practices inclusive, you will need to embed accessibility within the whole publishing workflow. Having an accessibility policy is an essential step towards doing this, as it demonstrates a company-wide commitment to inclusive publishing and guides how accessibility is implemented. The policy provides an overarching strategy that encourages, enforces and monitors accessibility across not only your publishing operations but also your websites, social media, events and procurement requirements.

You might also consider becoming a signatory to the Accessible Books Consortium's Charter for Accessible Publishing. This charter promotes the production of books in accessible formats. By signing the charter, you show your commitment to making your books fully accessible to all users. Specifically, the charter asks publishers to:

- "state their accessibility policy on their website
- nominate a senior manager who will be responsible for accessibility
- raise awareness among, and provide technical training for, relevant staff including freelance and contract designers, editors, indexers and production companies
- designate and publicise a point of contact in their organisation to assist persons with print disabilities to access their publications
- test their digital publications for accessibility, incorporating appropriate feature descriptions and metadata
- monitor their progress in this area
- promote the adoption of accessibility standards throughout the supply chain
- support national and international collaboration with organisations representing persons with print disabilities so as to increase the availability of publications in accessible formats." (World Intellectual Property Organization)

A publicly available accessibility policy or statement on your organisation's website should form part of a more detailed accessibility policy that includes the following elements:

- A summary statement – the rationale for the policy, expected outcomes, when key steps are to be completed, and how these steps are to be achieved.
- A policy implementation plan – who or which departments are responsible for implementing accessibility. Accessibility must be included in planning workflows and budgets. Everyone must be clear where responsibilities lie, what each person is responsible for and how it will be paid for. (Refer to the Workflow planning chapter for more information.)
- Effective dates – interim dates and deadlines for implementing each aspect of the policy, whether in a continuum or in stages. A quick first step could be to provide information on the website about whom to contact and a clear procedure for requesting files for conversion into alternative formats. The next stage would tackle existing workflows and the production of frontlist titles, before reviewing the accessibility of the backlist.
- Scope of the policy – not only every aspect of the publishing workflow but also the way the books are marketed, promoted and distributed. While the focus is on producing accessible publications, remember to ensure your websites and social media are accessible too.
- Technical standards – such as the EPUB Accessibility 1.0 Specification, the Web Content Accessibility Guidelines (WCAG) 2.1 specifications and PDF/UA (ISO Standard 14289: PDF for Universal Access).
- Procurement provisions – clear vendor guidelines concerning the implementation of the accessibility policy. The guidelines will set out the requirements for third-party vendors, such as editors, designers, typesetters and indexers, to adhere to in-house accessibility strategies and commitments. (See the Workflow planning chapter for more information on writing guidelines and briefs.)
- Mechanisms for ongoing review – reviewing the policy on a regular basis to ensure it stays up to date and achieves its aims. The public statement on the website should invite feedback from users who may identify further issues.

Once the accessibility policy is ready, you will need to review your workflows and guidelines to ensure they are aligned.

Working with disability organisations

Disability organisations and alternative-format producers need access to a publication's format-neutral master files, so they can produce alternative formats such as braille easily and quickly. This collaboration is covered by the provisions of 2 exceptions introduced in the *Copyright Amendment (Disability Access and Other Measures) Act 2017* (Cth). The first is a fair-dealing exception for people with disability and anyone assisting them. The second is an exception for organisations assisting people with disability.

Having a responsive and willing publishing team is vital to avoid the retroactive conversion of books, which is an expensive and time-consuming process. It can take a disability organisation anything from one week to 6 months to produce an alternative format, depending on many variables: the time it takes to get a file from the publisher, the type of source file, the size and complexity of the book and the type of output (for example, braille or large print). NextSense has calculated that it takes on average at least 900 hours to turn a high-school science textbook into braille.

In the short term, you can take the following steps to make this process easier:

- Improve the response and turnaround time for providing files. Provide updates on the processing of requests, and send the files electronically rather than by post. If you are part of a global company and the book was not produced locally, offer a straightforward way of contacting the correct overseas division.
- Provide suitable files. Ideally these should be native files such as Adobe InDesign, Adobe Illustrator, EPUB or MS Word. If you wish to send PDFs, provide the whole book in a single file rather than a PDF per chapter. The PDF must be clean and editable, with no digital rights management or watermarks (the latter interfere with legibility for people with partial vision and may prevent the document from being read by text-to-speech software).
- Have on your website a clearly defined and accessible policy and procedure for requesting content. This should include clear instructions and guidelines concerning timeframes, imprints and copyright, as well as a role-based email address and phone number.
- For global companies, create a centralised database of content to facilitate access to North American and United Kingdom rights.
- Improve the accessibility of online platforms that host accessible content.

Each of these actions constitutes an important step on the path to inclusive publishing. Every little bit helps.

Resources

Accessible Books Consortium, Charter for Accessible Publishing
Copyright Agency: Copyright Amendment Act 2017
ISO Standard 14289: PDF for Universal Access (PDF/UA), ISO 14289-1:2014
World Wide Web Consortium (W3C):

- EPUB accessibility 1.0 specification
- Web Content Accessibility Guidelines (WCAG) 2.1 specifications

Examples of public-facing accessibility policies:

- HarperCollins Publishers: Accessibility (HarperCollins)
- SAGE Publishing: Accessibility (SAGE)
- Sydney University Press: Accessibility (SUP)

References

Mrva-Montoya, A (2020). Producing accessible books in Australia: a snapshot, industry report, Sydney eScholarship Repository, University of Sydney.

Chapter 3
Workflow planning

All stakeholders should be made aware of their ethical and legal obligations to ensure accessibility. The best results will be achieved if this work is approached with openness, creativity and a willingness to collaborate in new ways.

Who is responsible?

For a book to be accessible, the publisher must think ahead, determining who in the team is responsible for accessibility considerations at each stage of the publication. This should be done as early as possible, during the project's planning phase, to avoid complications and delays later if a key stage is missed.

Most members of a publishing team are responsible for planning and implementing accessibility requirements in some way. Roles overlap, and in small companies only one or two people may be responsible for the entire production process. The overview below is a suggestion only, as each publisher will assign responsibilities differently.

Authors

Team members responsible for contracting and briefing authors, such as acquisitions editors or portfolio managers, should ensure all expectations and requirements are built into author contracts. For example, if an author is expected to provide notes for the writers of image descriptions, or to write the descriptions themselves, this should be stipulated clearly in their contract. This will allow the author to factor the extra work into their writing schedule, which will avoid potential misunderstandings and delays later.

Development editors should also consider the needs of readers with print disability when advising the author on content (refer to Author guidelines later in this chapter).

Production and publication

The production team should factor accessibility requirements into the choice of formats and target publication date. (For example, will the book be published simultaneously in both print and digital formats? Will the digital format be reflowable rather than a fixed-layout EPUB?) This includes any extra time or funds required to address accessibility requirements at every stage in the project workflow and when preparing the production schedule, vendor briefs and budgets.

Editing and design

Members of the production team, such as production editors, should create house style guides (refer to the chapter Writing and editing) and guidelines (refer to Briefs and guidelines later in this chapter). These should outline accessibility best practice for the editors, designers, typesetters and other vendors who work on their projects. A style sheet template is provided at the end of this guide.

In-house editors and designers must also be aware of and implement accessibility best practice for all projects they work on (refer to the chapters Writing and editing and Design).

Preparing image descriptions

Decisions about who is responsible for writing and checking image descriptions, and when, is affected by the size of the publishing company, the genre of publishing and the budget. There is no one solution, so the editorial team will need to consider all options before deciding on the best approach.

This issue should be resolved at the planning stage of the project, particularly for highly illustrated books such as educational texts. Illustrations for these publications can be time-consuming to prepare. If responsibility for the image descriptions is considered too late, the result can be either inadequate provision or significant delays in the production process.

For specialist topics where the author supplies the graphics (many academic texts, for example), the author may be the best person to provide the image descriptions, as they are most familiar with the images and the topic. The descriptions can then be tidied up during copyediting, to make sure they follow accessibility best practice.

Alternatively, other writers such as commercial vendors may be engaged to supply the image descriptions. In such cases, ask the author and/or illustrator to supply notes for each image, identifying the key points (and for textbooks, the learning objective) of the image and providing any raw data for graphs. This will ensure the vendor doesn't miss anything important or misinterpret any elements, which can easily happen when the context of the image is not considered. The notes will also provide a reference for other members of the production team who may be tasked with checking the image descriptions later.

Also decide who will check the image descriptions for:

- technical accuracy
- spelling and grammar
- adherence to best practice (refer to Part 3, Describing images and tables).

Ideally, the author should check the descriptions for accuracy, just as they do the rest of the content during proofreading. However, authors don't always pick up all grammatical errors, poor phrasing or repetition, so it's worth having the copy editor or proofreader check the material too. Image descriptions can add significantly to the word count, so the extra work must also be factored into the editing and proofreading budgets for the project.

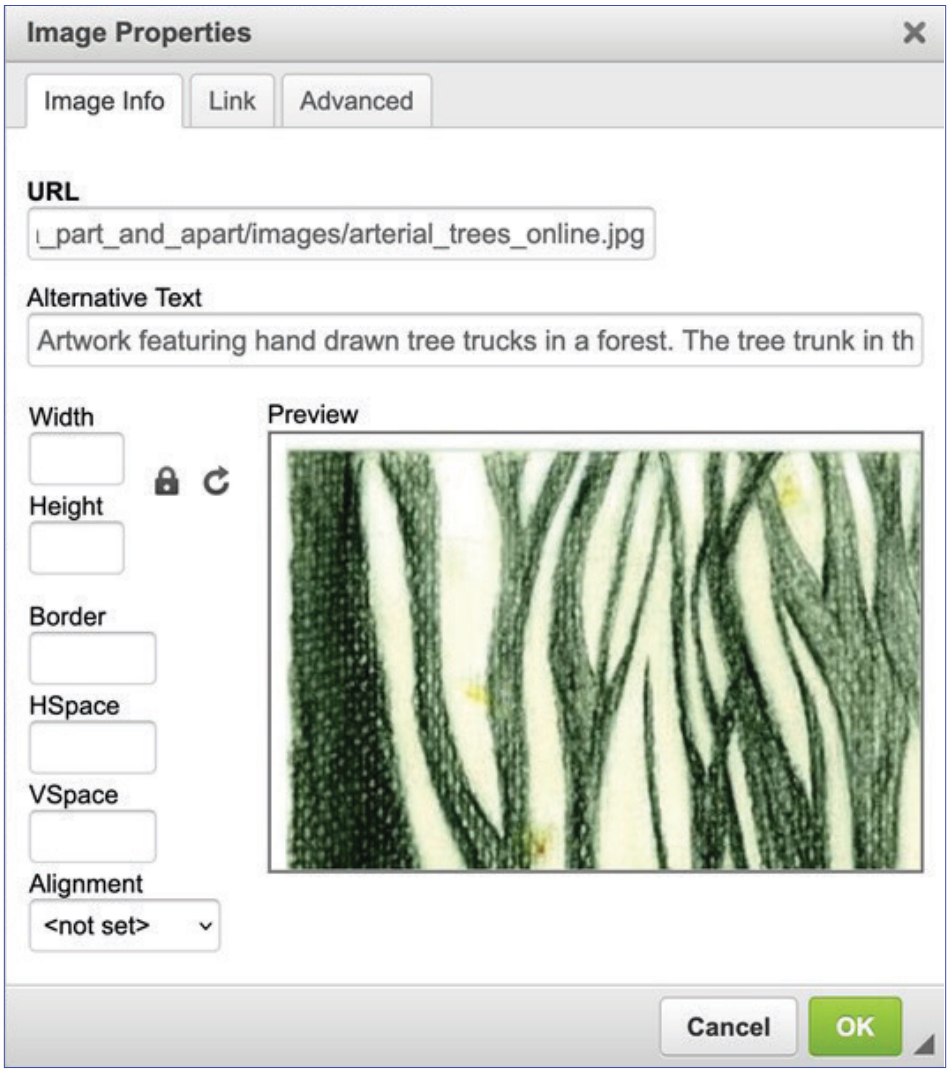
Consider where this process will fit into the schedule. The image descriptions should ideally be checked before they are incorporated into the digital platform, as lengthy descriptions can be difficult to read and edit in the small window provided (Figure 3.1).

Authors, picture editors, development editors and/or production editors may also find it useful to factor in how easy or difficult it will be to write the image descriptions for photographs when selecting images from photo libraries. Photos that are uncluttered, focusing on the key elements of the topic being illustrated with as few extraneous details as possible, make the work of the image-description writer easier. They can also be the best choice for all readers, including those without disability, as uncluttered photos often illustrate the subject more clearly than a busier image would do.

Technical requirements

The digital team should attend to the technical needs of accessibility (refer to the chapter Digital formats). This includes creating well-structured EPUB files that make use of the accessibility features on offer, uploading metadata for the sales team to work with, and contracting people with lived experience to test the files (refer to the chapter Quality assurance: reviewing and testing).

Figure 3.1: Screenshot of a lengthy image description that requires editing, with only part of the text visible



Source: IGP:Digital Publisher, InfoGrid Pacific.

Supporting alternative format providers

Rights managers should ensure that alternative format providers can easily find out whom in their organisation to contact and the process for requesting content.

Supply content as soon as possible after the request has been received, and in an appropriate format (MS Word, Adobe InDesign or EPUB rather than a PDF), particularly for educational texts (refer to the chapter Accessibility policies for publishers). If the material is supplied too late or requires significant rekeying, students relying on it may not receive their accessible copy in time to complete their studies that semester.

Briefs and guidelines

Providing appropriate guidelines and briefs for the authors and vendors involved in the project will help ensure best practice is followed throughout the publishing workflow. While the full details will be discussed in Part 2 (Developing content) and Part 3 (Describing images and tables), the following sections provide some general considerations for project briefs.

Author guidelines

Authors are usually best placed to ensure that the language and descriptions used are suitable for the reading level of the audience and the objectives of the text. Guidelines for authors could outline the different needs of readers with print disability (refer to the chapter Know your audience), as well as providing a checklist for how those issues could be addressed. Instructions may include details such as:

- writing effective image descriptions (refer to Part 3, Describing images and tables)
- choosing appropriate illustrations
- using elements other than colour to distinguish parts of diagrams or important text (discussed in the "Design" chapter)
- writing meaningful captions
- creating heading hierarchies (discussed in the "Writing and editing" chapter)
- the correct use of bold and italics (discussed in the "Writing and editing" chapter).

Writing image descriptions

Author guidelines and vendor briefs should provide information on what to include in image descriptions or author notes. Image descriptions may comprise alternative (alt) text only, or alternative text supplemented by a long description. Some general principles for a brief or checklist include:

- Assess images as to whether they may be purely decorative.
- Make sure that the image description fits the context of the image within the body of the text.
- Do not repeat material from the heading or caption, or from the alt text in the long description.
- Structure the information in a logical order.

- Check that all the key information in the image is provided in the description.
- Avoid using visual language.
- Do not interpret or make assumptions about what is in the image.
- Ensure any questions relating to the image can be answered appropriately from the image description alone.
- Check that any text in the image is included verbatim in the image description.
- Follow the spelling conventions used in the body of the text. While readers accessing the text by audio will not be aware of spelling, the image descriptions may also be accessed visually by some people, or by students using digital screen to braille software. Provide image-description writers with a copy of the publisher's house style, and the copy editor's style sheet where possible.

Refer to Part 3 (Describing images and tables) for further information.

Editing briefs

Editors and proofreaders should also be briefed to check for accessibility issues during the copyediting and proofreading stages. The brief may include reviewing the manuscript and page proofs for:

- problematic language and punctuation, such as terms that rely on visual interpretation (these should be listed in the house style sheet)
- information that is missing, incomplete or misleading for readers who can't see the text
- cross-references that rely on sight or sensory characteristics alone (for example, "the image on the right"; not only is this meaningless to someone who can't see the image, but the position of the image may change in different formats)
- headings that are not consecutive (for example, a heading level 4 under a heading level 2)
- text or graphics that rely solely on colour to distinguish different elements (such as references to "the blue and green lines" in a figure)
- global design or layout issues that may make reading difficult, such as typographic ligatures, poor colour contrast or the overuse of italics.

Refer to Part 2 (Developing content) for further information.

If the editor or proofreader is expected to check the image descriptions, provide them with a checklist of what to look out for, as well as the context

material and author notes. (A sample checklist is provided in the chapter Quality assurance: reviewing and testing.) Include the scope of work in the brief too, such as instructions on when the editor should correct the descriptions provided and when they should send it back to the writer for reworking or additional information.

Indexing briefs[2]

Features that are important for all index users can be crucial for users with a print disability. Points to include in the brief for indexers include:

- Use language that is appropriate to both the book and the age group of the readers.
- Create additional access points for readers who might approach the index in different ways, including the use of synonyms and alternative forms (unit/flat/apartment) and terms at different levels of specificity (penguin/emperor penguin).
- Use indented subheadings (where each subheading starts a new line) rather than run-on subheadings (where all the subheadings belonging to one term are run on together in a single paragraph), as indented headings are easier to follow.
- Make index entries and subheadings as short as possible, to reduce the chance that they will have to turn over onto a new line.
- Include additional structure in the index too if possible, such as linked letter groups – A, B, C and so on – that allow the user to move quickly through the index. (Letter headings are not crucial in print indexes, but they are in electronic indexes.)
- Use semantic mark-up (stipulating what things are rather than how they look). For example, code a line as "subheading" rather than marking it to be indented 3 spaces.

Design and typesetting briefs

Points to include in the brief for designers and typesetters include:

- Make sure the hierarchy of information in text and graphics is clear, especially in complex pieces, so that readers of varying abilities can

2 The information in this section was provided by Glenda Browne of the Australian and New Zealand Society of Indexers (ANZSI).

identify the logical order easily. Good navigation is an essential element of an accessible reading experience.

- Avoid complicated or decorative fonts, including italics in headings and quotes.
- If a font has ligature options, make sure these are turned off.
- Check that there is sufficient contrast between the font colour and the background.
- Don't make the line spacing too tight.
- Avoid placing text over "busy" images. If it's necessary to do so, the text should be boxed with black lettering over a white or light-coloured background.
- Set charts and graphs using colour-blindness friendly palettes. Strategies such as labelling, keys and patterns should also be considered, to make the data as easy to distinguish as possible.
- Avoid complicated background designs, to reduce distractions.
- For digital texts, embed links to the index and a glossary of key terms.
- Enable all the accessibility features of the format you are working in.

Refer to the chapters Design and Digital formats for further information.

Production workflow

Publishers use 3 types of workflows to release publications in multiple formats:

1. In a print-first workflow, the files for the print edition of a book are created first. The print source file is then used to produce other formats such as the ebook edition. In this form of workflow, the source file is created as a PDF, typically using Adobe InDesign. Once the print edition is ready, the digital (ebook) publication is produced. This is achieved by exporting an EPUB file from Adobe InDesign, or more often by converting the PDF file into EPUB, a process that is often outsourced.
2. In a digital-first workflow, the files for the digital edition of the book are produced first in a web-based content management platform. Once the ebook edition is ready for publication, the content is imported into Adobe InDesign and laid out for print. This workflow has been adopted by many textbook and academic publishers, as well as magazines and news publishing outlets. A digital-first workflow allows for an iterative publishing process. It has been associated with a reduction in production time and costs when publishing in multiple formats, as well as substantial improvements in product quality.

3. In a format-neutral workflow, content is prepared in an XHTML-based online system that has the capacity to output files in multiple formats, including a PDF file for print and an EPUB file. This means that different formats can be produced from the same source file without the need for additional steps or other software. These online systems can accommodate multiple image files in different formats (CMYK or RGB) and sizes (300 dots per inch (dpi) or 150 pixels per inch (ppi)) for print and digital formats respectively.

While a digital format is an add-on in the print-first workflow, digital-first and format-neutral workflows result in much better quality and more accessible EPUB files. This is because the structure and visual presentation must be separated during the production process, using different coding. (For example, the content and structure are coded in HTML in one document, while the presentation is controlled by a separate file containing CSS coding, a markup language used to style HTML documents.) The structure of the information (elements such as headings, lists and tables) is meaningful to people using assistive technologies, whereas its visual presentation (design elements such as typeface, colour and borders) may not be. The separation of structure from visual presentation makes it easier for assistive technologies to interact with the content; for example, so that the user just hears the heading level rather than what the heading looks like.

Using a digital-first or format-neutral workflow also allows much of the accessibility coding to be built into the publishing platform or software during the production process. The resulting file will therefore comply with the WCAG Level AA standard of accessibility without requiring manual remediation, which can be time-consuming and costly.

References

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Part 2
Developing content

Chapter 4
Writing and editing

For content to be born accessible, writers and editors must consider the diverse needs of their readers at every stage of the creative process.

The instructions in this section are primarily for documents written and edited using Microsoft Word (MS Word), as this is the most common format used for book manuscripts. The principles described are also applicable to other word-processing applications.

MS Word can be a very accessible format and it offers many flexible features. However, it is not generally the format in which books are published, and so any accessibility features included at this stage of the workflow must be carried forward to the end format wherever possible.

Structure and hierarchy

A well-structured document makes information easy to access. Headings, lists and body text organise the information logically. The correct use of document styles and tagging, formatting, links and cross-referencing is essential to doing this successfully. When a properly structured MS Word file is imported into Adobe InDesign, these elements are maintained. The document structure will simplify the design process and make it more efficient, and should result in a properly structured EPUB file on export.

Semantic tagging

Semantic tags are digital labels that convey meaningful information about the elements enclosed between the opening and closing tags. The tags allow assistive technologies to help non-visual readers understand the document structure and what elements such as bolding or italics are being used to convey. Some screen readers will change their tone of voice when reading to reflect text tagged as Strong (visually represented as bold) and Emphasis (visually represented by text in italics). Tagging also helps designers and typesetters distinguish the elements for visual readers (for example, by setting key terms in bold plus a different colour).

Using the Styles tool

Using MS Word paragraph and character styles to identify structural elements such as heading levels embeds the semantic tags in a document automatically. These styles are then transferred to the Adobe InDesign, HTML or XML files during the production process.

The Styles tool is useful for authors and editors as well as for readers, as it allows:

- the formatting (such as font and line spacing) to be managed in one place
- the heading structure of the document to be checked at a glance in the navigation pane
- the table of contents and page numbers to be generated automatically
- semantic tags to be added to words that require emphasis.

Styles must be used consistently and follow a hierarchy to ensure all document elements remain in a logical order. Consider developing a different set of styles for chapter end matter (such as banks of questions in textbooks), or elements such as boxed examples that sit within the body text but are not part of the main hierarchy. New paragraph styles can be created by selecting the arrow to the right of Styles in the Home tab and then Create a Style.

Tagging bold and italics

Elements such as bolding may be required for different functions within the same text. For example, in educational texts it may be used to provide emphasis in some places and to highlight key terms in others. When you use the Bold tool in MS Word, it automatically adds invisible tags and at the beginning and end of the word. However, the tag has no semantic value. It shows how the enclosed word looks but it does not distinguish between the different functions that bold may have.

To distinguish these elements in MS Word, use character styles to tag bolding for emphasis as (by selecting a character style of that name), or creating a "key-term" style of your own, rather than applying the Bold tool. The tag is semantic because it tells the user what the element is. Similarly, to italicise text for emphasis, use the character style <emphasis> instead of the Italic tool. This will translate into italicised text in the digital book. (However, we encourage the use of bold rather than italics for emphasis where possible; refer to Bold and italics in the section on Style later in this chapter.)

For both bold and italics, the visual tagging can be replaced by using the Find and Replace tool:

Find → Format → Font style → Bold

and replace with

Format → Style → Strong

However, italics used as a convention to denote elements such as book titles, genera and Acts of Parliament should be excluded during this process. As italics is not being used for emphasis here, format these elements with the standard Italic tool, not the Emphasis character style.

Headings

Headings are one of the main structural elements that users rely on to navigate a book. However, many readers with print disability cannot simply scan the headings by flicking or scrolling through the pages of a book. They need appropriately styled and well-written headings to be able to find what they want.

Styles for headings

To support readers with disability, headings must be styled correctly – such as "Heading 1" – from the very beginning of the writing and editing process. This will mean the tags are embedded in the file used to create an accessible book, whether it be produced in braille or EPUB.

Manually changing text to look like a heading (such as by bolding it), but without applying a heading style, creates a document without the semantic tags. It becomes a book without headings or structure that will need substantial remediation to be accessible in a digital format. Left unremediated, the extra character formatting also adds an unnecessary and meaningless layer of information for braille users.

Sequential headings

Headings form a hierarchy of information that must be in the right order, starting at level 1. In a book, heading level 1 is usually a chapter heading. Heading level 2 should always sit after a heading level 1 and before a heading level 3. Never skip a heading level, for example by starting with heading level 1 then jumping to level 3. While someone using a printed book may not notice this discrepancy, it can cause confusion for someone using a screen reader. Screen readers help people navigate through headings, so if the hierarchy is inconsistent, this can leave the user unsure whether they have missed the level 2 heading for some reason (refer to Figure 11.1 in the "Design" chapter).

Apply this hierarchy across the whole publication, including chapter end matter, not just the body text within each chapter. For example, do not give a heading the style "Heading 4" just because it's the fourth type of heading you have created. It is only level 4 if it sits logically under a level 3 heading.

To help users maintain a mental map of the content, use no more than 4 levels of headings. Also ensure that there is at least one line of text between each heading and the next. This will avoid stacked headings, which can be confusing for some readers (refer to the section Hierarchy in the "Design" chapter).

Distinctive headings

Headings should be descriptive, clear, short and distinct.

Put the most important information at the beginning of the heading, ensuring it is not repeated in subsequent headings. People using screen readers may skim through the first words of headings to establish what is on the page. If the same words or phrases are repeated, the user may think they have heard the same heading more than once when in fact they are different.

For example, under the heading "Jointing methods" in a book on plumbing, the subheadings should be:

Steel pipe joints
Copper pipe joints
Cast iron pipe joints

not:

Methods for jointing steel pipe
Methods for jointing copper pipe
Methods for jointing cast iron pipe

Lists

Set a list containing items that can go in any order as a bullet list. If the list items need to be in a particular order, create a numbered list.

If a list has a second level, use a nested system to create the list structure. This is so users of screen readers can perceive which items are part of a sublist and which are the main list items. A nested list is a list within a list, with a further indent and a different symbol (such as a dash) or numbering system (such as an "abc" list within a numbered list) for the second level. Avoid having more than 2 list levels where possible, as complex lists can be difficult for readers to follow.

Create lists using the correct tool (bullet or numbered lists) rather than manually using tabs with symbols or numbers, so that users of screen readers can

understand and navigate the list easily. Lists can be customised in MS Word using the bullet or numbered list tool and selecting "Change list level" to create the second level. The shape of the bullet point can be changed by selecting "Define new level" for bullet lists or "Define new number format" for numbered lists.

Bullet lists

Use a solid bullet point for the first bullet and a different shape, rather than another circle, for the second level, so that they can be easily distinguished (Figure 4.1).

Numbered lists

Use full stops after numbers in lists, rather than parentheses, to make it clear that the number is not part of the content being listed. This will help avoid any potential confusion to users of screen readers or braille who can't see that the list number is in a different font or colour (if these are used to distinguish it), especially if the sentence also starts with a number. This includes lists that start with a letter, especially in mathematics texts where a mixture of numerals, letters and brackets can be used (Figure 4.2).

Figure 4.1: A nested list using bullet points and dashes

- stone fruit:
  - plums
  - nectarines
  - peaches
  - cherries
- berries:
  - strawberries
  - blueberries
  - raspberries
  - boysenberries
- citrus:
  - oranges
  - mandarins
  - lemons
  - limes

Figure 4.2: Numbers in lists and questions that could be confusing without full stops

1. One-half the distance between A and C is ___?
2. Three little pigs went to market …

Finish the following equations for x:

6. $6 = 2x - 4$

Factorise each of these expressions:

a. $b(c + 4) + (c + 4)$

b. $a(x - 3) + 5(x - 3)$

For nested lists where the sub-level question number is on the same line as the main number, use a full stop followed by an indent to separate the levels (Figure 4.3).

Figure 4.3: **A nested list**

4. a. What are clouds?
   b. How are clouds formed?
   c. List 3 different types of cloud.

Text

Text is as important to the document structure as headings, lists and other structural elements. It therefore needs to be formatted appropriately. Styles can be created and applied to any text element, including:

- paragraphs
- block quotes (without a <blockquote> tag, people using text-to-speech technology to access content could misattribute the content to the author of the book and not the author of the quote)
- figure and table headings and captions
- source/credit lines.

Bear in mind that screen readers read all page content, not just the text. Your formatting instructions may be read aloud, including the insertion of tabs, spaces and line breaks. They should therefore be used correctly and never just for visual effect. This is a good example of how content and structure (which convey information) need to be considered separately from design (visual appearance).

Paragraph formatting

To format paragraphs:

- Include an indent in the paragraph style rather than using a tab or several character spaces to indent a new line.
- Adjust spacing between paragraphs using the Line and Paragraph Spacing function rather than adding an extra line space using the Return key.

Consider the cognitive load on readers as you decide on the length of paragraphs. Some people with print disability are not able to comfortably read through the "wall of text" created by long paragraphs. Shorter paragraphs, even with the most complex language, improve accessibility. They are also easier to read for everyone.

Boxed elements

Do not use text boxes for callouts. Screen readers, including the Read Aloud function in MS Word itself, skip text boxes, effectively making them invisible for a person who is blind.

If you want to box text elements in an MS Word document, use the paragraph borders function in Styles instead. To do this, select the text you want to box, go to Create a Style and give it a name (for example, "Box 1"), select Modify, choose Format and then Border from the dropdown menus, and select the type of border you want.

Links

The requirements for styling hyperlinks in MS Word documents can vary across publications, depending on the formats in which the content will be published. Descriptive hyperlinks are appropriate for digital content, for example, but are meaningless in print. We recommend discussing this issue with the publisher before writing and editing begin, and choosing a strategy suited to the publication.

For information on the different options for presenting hyperlinks, see the chapters Design and Digital formats.

Cross-references

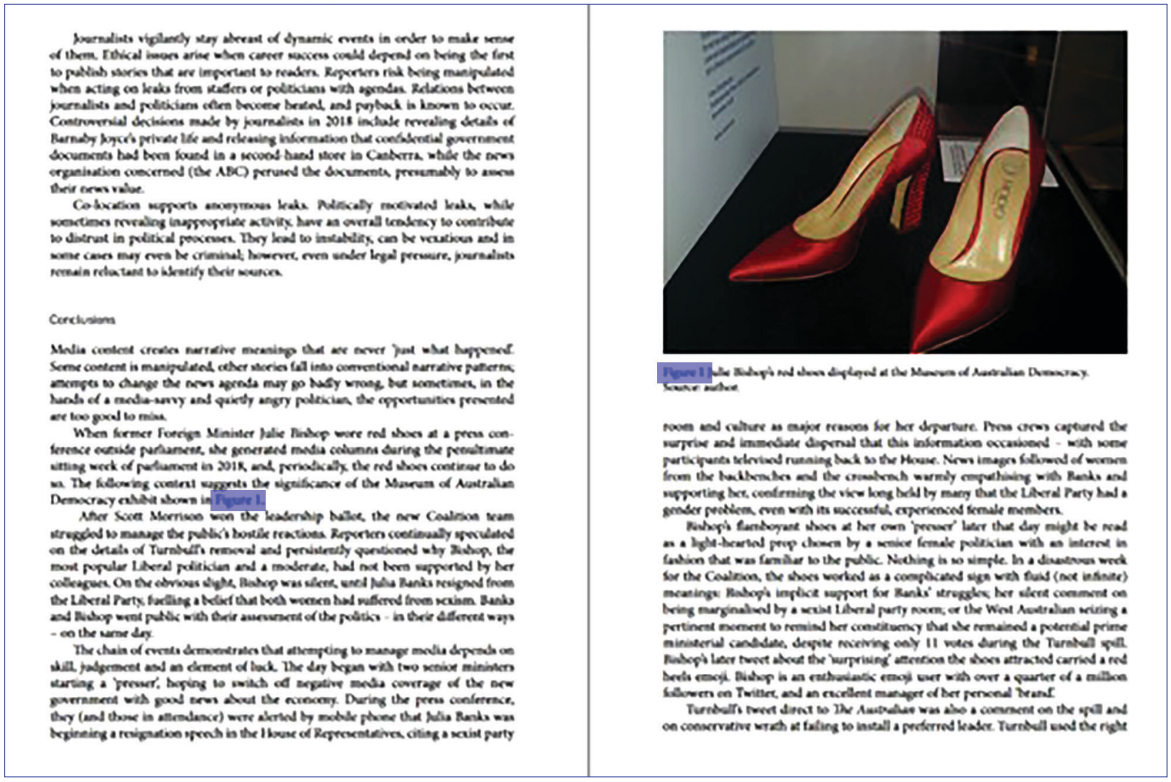
Many elements in a final publication will be placed differently across various formats. For example, in the print format, illustrations may be located opposite the text that refers to them or at the top or bottom of a page. In the digital format, they will usually be placed directly below the cross-reference (Figures 4.4a and 4.4b).

To reduce the amount of remediation needed to produce each format, cross-references should be format neutral. They should also be understandable to readers who cannot see the text:

- Avoid using visual instructions (for example, "the boxed feature on the right", "the section above", "the paragraph below"). Use clear descriptions instead (for example, "the feature, 'Reading in Australia'"; "the section on Australian reading habits", "the following paragraph").
- Refer to headings or sections of the book rather than page numbers, which are likely to change across different formats.
- In highly illustrated publications, where the text refers to the illustrations, use a numbering system rather than descriptions to identify graphic

Figure 4.4: Placement of a figure in different formats

(a) The figure in a printed book (text cross-reference highlighted in blue).



Journalists vigilantly stay abreast of dynamic events in order to make sense of them. Ethical issues arise when career success could depend on being the first to publish stories that are important to readers. Reporters risk being manipulated when acting on leaks from staffers or politicians with agendas. Relations between journalists and politicians often become heated, and payback is known to occur. Controversial decisions made by journalists in 2018 include revealing details of Barnaby Joyce's private life and releasing information that confidential government documents had been found in a second-hand store in Canberra, while the news organisation concerned (the ABC) perused the documents, presumably to assess their news value.

Co-location supports anonymous leaks. Politically motivated leaks, while sometimes revealing inappropriate activity, have an overall tendency to contribute to distrust in political processes. They lead to instability, can be vexatious and in some cases may even be criminal; however, even under legal pressure, journalists remain reluctant to identify their sources.

Conclusions

Media content creates narrative meanings that are never 'just what happened'. Some content is manipulated, other stories fall into conventional narrative patterns; attempts to change the news agenda may go badly wrong, but sometimes, in the hands of a media-savvy and quietly angry politician, the opportunities presented are too good to miss.

When former Foreign Minister Julie Bishop wore red shoes at a press conference outside parliament, she generated media columns during the penultimate sitting week of parliament in 2018, and, periodically, the red shoes continue to do so. The following context suggests the significance of the Museum of Australian Democracy exhibit shown in Figure 1.

After Scott Morrison won the leadership ballot, the new Coalition team struggled to manage the public's hostile reactions. Reporters continually speculated on the details of Turnbull's removal and persistently questioned why Bishop, the most popular Liberal politician and a moderate, had not been supported by her colleagues. On the obvious slight, Bishop was silent, until Julia Banks resigned from the Liberal Party, fuelling a belief that both women had suffered from sexism. Banks and Bishop went public with their assessment of the politics – in their different ways – on the same day.

The chain of events demonstrates that attempting to manage media depends on skill, judgement and an element of luck. The day began with two senior ministers starting a 'presser', hoping to switch off negative media coverage of the new government with good news about the economy. During the press conference, they (and those in attendance) were alerted by mobile phone that Julia Banks was beginning a resignation speech in the House of Representatives, citing a sexist party

Figure 1: Julie Bishop's red shoes displayed at the Museum of Australian Democracy. Source: author.

room and culture as major reasons for her departure. Press crews captured the surprise and immediate dispersal that this information occasioned – with some participants televised running back to the House. News images followed of women from the backbenches and the crossbench warmly empathising with Banks and supporting her, confirming the view long held by many that the Liberal Party had a gender problem, even with its successful, experienced female members.

Bishop's flamboyant shoes at her own 'presser' later that day might be read as a light-hearted prop chosen by a senior female politician with an interest in fashion that was familiar to the public. Nothing is so simple. In a disastrous week for the Coalition, the shoes worked as a complicated sign with fluid (not infinite) meanings: Bishop's implicit support for Banks' struggles; her silent comment on being marginalised by a sexist Liberal party room; or the West Australian seizing a pertinent moment to remind her constituency that she remained a potential prime ministerial candidate, despite receiving only 11 votes during the Turnbull spill. Bishop's later tweet about the 'surprising' attention the shoes attracted carried a red heels emoji. Bishop is an enthusiastic emoji user with over a quarter of a million followers on Twitter, and an excellent manager of her personal 'brand'.

Turnbull's tweet direct to *The Australian* was also a comment on the spill and on conservative wrath at failing to install a preferred leader. Turnbull used the right

(b) The figure in reflowable EPUB (text cross-reference highlighted in blue).



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Turnbull's tweet direct to *The Australian* was also a comment on the spill and on conservative wrath at failing to install a preferred leader. Turnbull used the right of reply on a social media platform against a story attacking his reputation and legacy. Like Bishop, he is not an ordinary citizen. Prior media and public interest in the senders' political status was required to give both tweets the significance they acquired.

This chapter has touched on mediation processes, old and new players, the challenges of transformation and public concerns. It is encouraging that, despite the loss of trust in contemporary politics, Australians' interest in political events remains strong. Nielsen digital ratings show that time spent reading online news spiked to 44 per cent more than the daily average on the day of Turnbull's removal, 24 August 2018, with Australians accessing news across all platforms and devices.[34] However, trust in media fluctuates. During the Turnbull spill, Chris Uhlmann's accusation that some right-wing journalists crossed the line to become 'players in the game' in the ousting of a prime minister is a compelling and timely warning against such abuses of the privileges enjoyed by journalists. A perceived focus on click-worthy political content, rather than policy discussion, is also a legitimate criticism of media.

References

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2 pages left in this chapter

Source: Open Textbook Editorial Group (eds) (2021), *Australian politics and policy: senior edition 2021*, Sydney University Press.

elements. Number figures and tables consecutively by chapter (Figure 1.1, Figure 1.2 and so on), so that all readers can easily identify the illustration being referred to.

- For technical publications with lots of cross-references, consider numbering the headings by chapter too. Numbered paragraphs can also be useful for some publications (such as law books).
- In educational texts, number boxes, examples, in-text activities, questions and other pedagogical elements sequentially through each chapter. Each item will then have a unique number ("Example 2.2", "Activity 3.4"), making cross-references easier to understand.

Style

As for other areas of the publishing process, the following points are guidelines only. Their relevance will depend on the context of each publication, including the purpose of the text, target readership and expected reading level.

Capitalisation

Avoid styling text in all capital letters. This can be difficult for most people to read, particularly those with visual and perceptual disabilities. (Refer to the section Legibility and readability in the "Design" chapter for more information.)

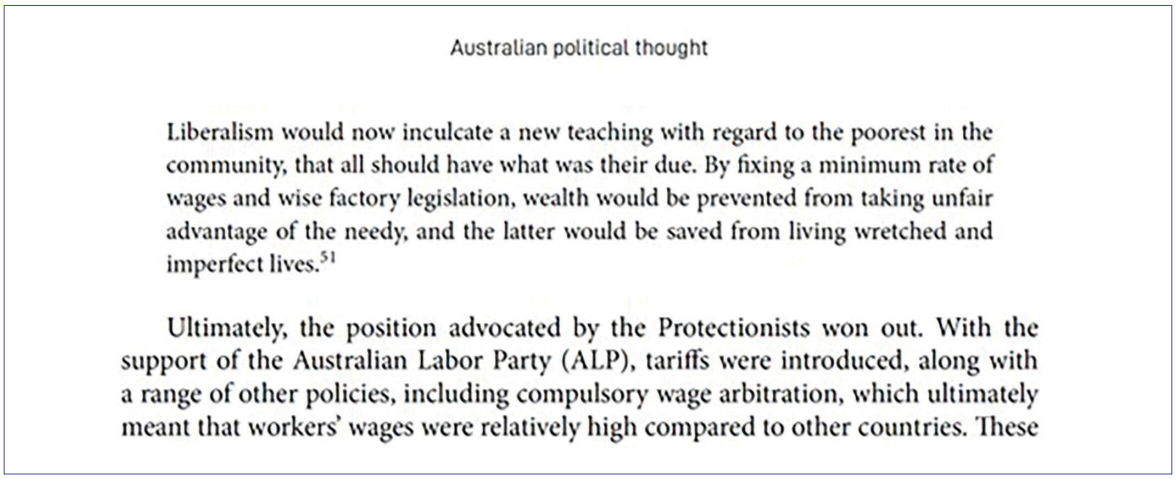
Bold and italics

Do not rely on visual cues such as italics and bold for emphasis or visual effect. These increase the information load for braille users. Large blocks of italics can also be tiring and challenging to read for all readers, especially people with low vision or perceptual disabilities.

We are not suggesting that bold or italics should never be used. They are fine when following established conventions, such as using italics for the titles of publications and species names. However, they may not be needed in all instances. For example:

- Try restructuring sentences to provide emphasis rather than relying on bold or italics.
- If visual emphasis is required, use bold instead of italics where possible. Bold is easier to read for people with low vision. (Refer to the section Semantic tagging earlier in this chapter for instructions on how to distinguish bolding and italics for different purposes in a text.)

Figure 4.5: A quote that is easily distinguishable without italics because it is block indented and laid out using a smaller font


Australian political thought

Liberalism would now inculcate a new teaching with regard to the poorest in the community, that all should have what was their due. By fixing a minimum rate of wages and wise factory legislation, wealth would be prevented from taking unfair advantage of the needy, and the latter would be saved from living wretched and imperfect lives.[51]

Ultimately, the position advocated by the Protectionists won out. With the support of the Australian Labor Party (ALP), tariffs were introduced, along with a range of other policies, including compulsory wage arbitration, which ultimately meant that workers' wages were relatively high compared to other countries. These

Source: Open Textbook Editorial Group (eds) (2021), *Australian politics and policy: senior edition 2021*, Sydney University Press.

- Consider whether elements that are set apart from the main text, such as a letter or flashback in creative writing, need to be set in italics. Perhaps they could be denoted using block indentation or a change in typeface instead.
- Flag longer quotes by formatting the text in an offset block and short quotes by placing them within quote marks (Figure 4.5). Additional italics are unnecessary and can interfere with readability.

Acronyms and abbreviations

Shortened forms can be difficult to read and interpret for people with low vision, cognitive disabilities, and perceptual disabilities such as dyslexia. And while common acronyms such as that for the World Health Organization (WHO) are often recognised and read correctly by screen readers, less common ones may not be, especially if they contain vowels.

- Explain acronyms the first time they are used, giving the full version first before the acronym in parenthesis: Australian Publishers Association (APA). This makes it easier to identify what the acronym refers to even if it is mispronounced.
- Avoid Latin abbreviations in the body text where possible. Screen readers often try to pronounce abbreviations if they contain vowels, so for

example “ie” may be read aloud as “eye”. Where abbreviations are required, such as in tables and charts or for times of the day, write them with full stops: i.e., e.g., 6 a.m.

- Where other abbreviated terms must be used in the text, provide the term in full the first time it is used, followed by its abbreviation in parenthesis: gross domestic product (GDP).
- Consider providing a separate list of acronyms or abbreviations for quick reference.

You can test how acronyms and abbreviations may sound when using a screen reader by using MS Word’s Read Aloud tool.

General punctuation

Accessibility considerations are also important for style decisions about punctuation. Think about how words will sound when read out, and ensure you are using punctuation that is appropriate for both braille and print users.

- Use “from” with “to” or “between” with “and'' rather than en dashes where possible in general text (for example, “aged between 12 and 15” or “from 12 to 15 years old”). En dashes can be difficult for some people to see, and most screen readers do not read them out. Use dashes only where necessary, such as for financial years and page, date and number ranges in technical content and reports.
- Avoid closed em rules for dashes before clauses providing explanation, description or further information. Closed dashes can be difficult for people with low vision and some perceptual difficulties to see. Instead, use spaced en rules (or even spaced em rules if the font being used in the publication has particularly small en rules).
- Minimise punctuation wherever possible (for example, in referencing styles), to reduce the information load for braille users.
- Use double quote marks around short quotations, and single quote marks only for quotes within quotes. Double quote marks are easier to see for people with low vision. They also save a lot of time for braille transcribers. Closing single quote marks are visually indistinguishable from apostrophes, and the symbols do not have a separate key on computer keyboards. However, they have different braille codes. After the text has been transcribed into braille using specialist software, every quote mark and apostrophe in the proof therefore has to be checked and manually corrected where necessary. This intensive remediation

work uses up precious resources that could be better spent elsewhere. Using double quote marks when writing a manuscript can be much easier and less costly than having to rectify it later, for example during the editing process.

It is possible to distinguish between apostrophes and single quotes in MS Word using the correct Unicode for each symbol every time you insert it, although this would also be very labour-intensive for most documents. The Unicode for the apostrophe is 0027; the Unicodes for single opening and closing quote marks are 2018 and 2019 respectively. (For more information on Unicodes, refer to the section Symbols.)

Numbers

- Where possible, write "zero" and "one" in words in general sentences, to avoid potential confusion with the letters "O" and "I", particularly by people with low vision or dyslexia.
- Use numerals rather than words for numbers 2 and above in general sentences, except at the start of a sentence or where the number is unimportant or unspecific ("one or two people"). Numerals are easier for readers to scan and generally require fewer cells in braille.
- Do not use superscript in ordinal numbers (for example, write 20th, not 20th). Superscripts are difficult to read for people with low vision and some perceptual disabilities.
- Avoid running numbers next to each other in text ("Yesterday we counted 62, 3 of which were blue"), as this can be confusing for some readers.
- Use comma separators in numbers for numbers over 999 rather than spaces – for example, 10,000 (to avoid the reader hearing "10 thousand" as "10 zero zero zero").
- Use the word "million" rather than 6 zeros unless the full number is required, such as for technical use. Avoid abbreviating this to "m", as some readers find it difficult to remember what shortened forms stand for (and it can also be confused with "m" for "metres").

Symbols

Symbols in circles, such as the copyright © and registered trademark ® symbols, can be difficult to interpret for some readers with perceptual disabilities. Write the word in full before the symbol so that the meaning is immediately clear: copyright ©.

Ensure you use the correct mathematical and scientific symbols rather than something that just looks like them. (For a list of commonly confused symbols, refer to the section Maths as ordinary text in the chapter, "Considerations for mathematics and science texts".) The difference may not be apparent visually, but the result will be confusing when accessed using a screen reader or transcribed into braille. Remember that assistive technologies will read out what is actually there, not what it looks like.

Computers store letters and characters by assigning each one a unique number or code. The Unicode system is an international standard that allows a character to be recognised across all platforms, programs or languages.
To insert a symbol:

1. Use the Insert function in the Word toolbar and select "Symbol".
2. Select "More Symbols" in the pop-up. This will list all the symbols available in Word. You can also use keyboard shortcuts (such as Alt+Ctrl+C for the copyright symbol) for some characters if you know what they are.
3. Check the Unicode name near the bottom of the pop-up to ensure you have the correct symbol. This can be useful for symbols that are easily confused. It is also handy for checking punctuation such as ellipsis, as MS Word's inbuilt Read Aloud function does not read this out.
4. If you can't find the character you need, you can enter the name (for example, "square root") in the search function on the Unicode website. This will provide you with links to information for the correct Unicode (221A for the square root symbol), which you can enter in the Character code box in MS Word's Symbols pop-up. It should then take you to the right character.
5. Select "Insert" to add the symbol to your text.

Referencing and notes

References and notes containing additional information may be presented in various ways:

- using an author–date reference system in-text for references, with the full reference given in a list at the end of the chapter or book
- with a superscript number in the text and the full reference or information in a footnote
- with a superscript number in the text and the full reference or information in a set of endnotes

- using a combination of an in-text system for references and footnotes or endnotes for additional information.

Writers and editors don't always have a choice about the referencing style, as many disciplines, publishers and universities follow specific style guides rigidly. The system you use will also depend on the type of publication and the number of notes and references. Each has advantages and disadvantages:

- In-text referencing systems, such as "(Jones 1999)", are easier to see than numbered systems, which may be an advantage for readers with low vision. However, they create clutter in the text if there are a lot of them. This may be distracting for some readers, particularly those with learning disabilities.
- Endnotes and footnotes reduce clutter in the body text, but the note number may be difficult for readers with low vision to see, especially if it is too small.
- Footnotes can be useful for quick reference, as they keep the information on the same page for print books. If they are extensive, they do affect the overall look of the page. Footnotes can also create a distraction for some readers if they keep stopping to read the notes rather than following the flow of the text.
- Endnotes do not clutter the page. However, while they can work well for references, they should be used sparingly for notes containing additional information. It can be distracting, and not necessarily easy, to have to keep turning to the end of the book or chapter to find additional information.

Irrespective of the system used, create links to the reference notes for digital versions of the text so that readers can navigate to them easily. MS Word and Adobe InDesign tag and hyperlink footnotes correctly if you insert the notes into the document using their built-in footnote utilities rather than, say, the Footers function in MS Word.

If you are using footnotes or endnotes, consider whether it might be less distracting to incorporate additional information (other than references) into the body text instead, where possible (also refer to the section Footnotes or endnotes in the "Design" chapter).

Language

As discussed in the chapter Know your audience, the use of plain language or Easy Language is covered extensively elsewhere and is not within the scope of this guide. There are, however, 2 other aspects of language that need to be considered in inclusive publishing: non-visual and inclusive language.

Non-visual language

For content that is primarily intended to convey information, such as educational texts, an overreliance on visual language can create barriers to understanding for some readers. (Also refer to the section Language in the chapter, "Considerations for children's books".)

- Consider using descriptive, multisensory language instead of purely visual expressions where possible ("the tall, three-storey house with an upstairs balcony" rather than "the tallest house in the block"; "the girl with short, curly hair", not "the girl on the right of the picture"). This can often create a richer experience for all readers, not only those who are blind.
- Don't refer to elements only by colour or other visual descriptions that may not be perceivable to all readers ("the AC curve", not "the green curve"). Colour can still be used where necessary, but describe another feature of the object too, so that it can be distinguished from the other objects by tactile readers ("the stripey blue ball", rather than just "the blue ball"). (Refer to the section Three-dimensional printing in the chapter, "Know your audience" for more information.)
- Be mindful of potential ambiguity when referring to the content of images or other non-text elements. (Does "beneath" mean "directly underneath" or "below and directly in front of" something?)

Where possible, also avoid:

- idioms and metaphors in text used for information. Metaphorical language can be difficult to understand for people with conditions such as autism.
- jargon. If specialised terms are needed, consider defining them within the text and providing a glossary.
- specific physical instructions such as "type", "circle" and "drag" (for example, in examples used in educational texts). Use more general verbs instead where possible, such as "select", "identify" and "choose".

Inclusive language

Refer to people with disability in a respectful manner. Language is evolving, and different expressions are used both within Australia and in other countries. For example, some people use person-first language ("people with disability") while others prefer identity-first language ("disabled people"). However, while there is not always consensus, some key points are:

- Focus on the person rather than their disability. Refer to a person's disability only when it is relevant.
- Do not reduce people to their disability, for example by using phrases such as "the disabled".
- Do not use phrases and words that demean individuals or imply limitations. (For example, use the term "wheelchair user" rather than "wheelchair-bound".)
- Describe people as having or living with a condition, rather than using phrases that imply an individual or group should be pitied (such as "suffering from", "afflicted by", "victim of" or "struck down by" a condition).
- Do not patronise people with disability by portraying them as courageous or inspirational in the way they perform their everyday activities.
- Be direct ("Savita is blind"; "Mark has spina bifida"; "people living with Down syndrome") rather than using euphemisms such as "special needs" or "differently abled".
- Where possible, ask the person or group being described what terms they prefer when referring to them. People With Disability Australia suggests that where this is not possible, use person-first language or refer to the person by their name.

Resources

Australian Government, Style manual
British Dyslexia Association, Dyslexia-friendly style guide
Microsoft Support, Make your Word documents accessible to people with disabilities
People with Disability Australia, PWDA language guide: a guide to language about disability
Unicode, Unicode character table

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Chapter 5
Creating accessible tables

Tables can be one of the most difficult elements to follow for some people with print disability. Readers who cannot see the table must remember information that sighted readers can see at a glance; in other words, which column and row the value in each cell relates to.

People using screen readers use tabs or left and right arrows to navigate the table. The screen reader will read each cell in the order that it is set up. If the table is set up in a logical manner then the information will be organised logically, making the table straightforward to read. If the table is not set up properly, however, the reading order may be jumbled and it will be difficult to understand the contents of the table.

Don't forget to provide alt text to give a brief overview of what the table contains. This allows users to be able to decide whether to skip the table or to read it in detail. (Refer to the chapter Descriptions for different types of illustration for information on how to write descriptions for tables.)

Set-up

Create tables in MS Word using the Insert > Table function rather than as a series of tab stops. This informs readers who cannot see it that the material is intended to be read as a table. A user can then interpret which row and column intersection each cell refers to as they move down the table. This helps to make the table more accessible.

Columns and rows

Use columns and rows appropriately:

- Do not create tables that have only one column. This is confusing for users of screen readers, as they can't find the second column they expect of a table. If the material is only a single column wide, it should be treated as a list instead. If a table has only 2 columns, consider whether this could be redesigned as a list.

- Try to keep the number of columns in a table to a minimum and avoid having more columns than rows. This will also help keep the table on a single braille page when it is transcribed, making it easier to track.
- Ensure that all columns have headings, even if the heading seems obvious and could be inferred from the table caption. Headings help readers track what the data in any given cell refers to, so they should never be omitted. Rows should also have headings if there is a row cell that is functioning as a label for the entire row. Open the Table Design tool in MS Word to create column or row headings, using the check boxes to mark them as "Header row". This will distinguish the headings from table data cells. These properties generally carry over to Adobe InDesign, EPUB and PDF.
- Do not merge columns or rows. Merged elements are difficult to comprehend for users of screen readers.

Table cells

Do not leave empty cells. A reader listening to the information may find an empty cell confusing, as they don't know whether they missed the data because it's not there or because they accidentally skipped it. If there are no values for a cell, signify this by using a zero or a convention for "null data" for numbers, or "n.a." or "not applicable" for text.

If cells are left deliberately empty, such as in a textbook where students are expected to add the missing values, explain this in the body text or table caption (Figure 5.1).

Figure 5.1: **A table with empty cells and explanatory text**

The following table has missing values. Solve the equation using the values provided and complete the table.

Equation	*x*	*y*	*z*
$x+y=z$		3	5
$x-y=z$	8	Blank	8
$x+z-y=x$		4	

Large tables

Avoid creating large, complex tables wherever possible, particularly if the information is for a general readership or educational use. If the table is too big, the braille transcription of it will not fit on one page, making the table much harder to read.

If the table is a large one, consider whether it can be broken up into simpler, smaller tables covering individual aspects of the topic, rather than condensing all the information into one big table. This is an improvement that can benefit all readers, not just people with print disability, as it makes the information more digestible in the same way that having shorter paragraphs makes the text more accessible.

Breaking up a table also removes the problem of having multiple table headings. The headings can sit outside the table instead, structured either as headings in the main heading hierarchy or as table captions. This allows the headings to be picked up by navigational aids in a way that they will not be if they are embedded in the table.

For instance, the table in Figure 5.2 is complicated and would be tricky to navigate using a screen reader or braille. It has more columns than rows and contains an empty cell.

However, it can easily be broken into multiple, simpler tables, as shown in Figure 5.3. These are much more straightforward to read.

Figure 5.2: **Example of a complex table**

Table 1. Olympic gold medallists in all men's freestyle swimming events between 2004 and 2016.

Distance	2004		2008		2012		2014	
	Gold medalist	Time	Gold medalist	Time	Gold medalist	Time	Gold medalist	Time
50 m	Gary Hall (US)	21.93	César Cielo (Braz)	21.30	Florent Manaudou (Fra)	21.34	Anthony Ervin (US)	21.40
100 m	Pieter van den Hoogenband (Neth)	48.17	Alain Bernard (Fra)	47.21	Nathan Adrian (US)	47.52	Kyle Chalmers (Aus)	47.58
200 m	Ian Thorpe (Aus)	1:44.71	Michael Phelps (US)	1:42.96	Yannick Agnel (Fra)	1:43.14	Sun Yang (Chi)	1:44.65
400 m	Ian Thorpe (Aus)	3:43.10	Park Tae-hwan (S Kor)	3:41.86	Sun Yang (Chi)	3:40.14	Mack Horton (Aus)	3:41.55
1500 m	Grant Hackett (Aus)	14:43.40	Oussama Mellouli (Tun)		Sun Yang (Chi)	14:31.02	Gregorio Paltrinieri (Ital)	14:34.57

Figure 5.3: Breakdown of the complex table into smaller tables (Tables 1 to 3) for the first 3 distances shown in Figure 5.2

Table 1. Olympic gold medallists in all men's 50-metre freestyle swimming events between 2004 and 2016

Year	Gold medalist	Country	Time
2004	Gary Hall	United States	21.93 seconds
2008	César Cielo	Brazil	21.30 seconds
2012	Florent Manaudou	France	21.34 seconds
2016	Anthony Ervin	United States	21.40 seconds

Table 2. Olympic gold medallists in all men's 100-metre freestyle swimming events between 2004 and 2016

Year	Gold medalist	Country	Time
2004	Pieter van den Hoogenband	Netherlands	48.17 seconds
2008	Alain Bernard	France	47.21 seconds
2012	Nathan Adrian	United States	47.52 seconds
2016	Kyle Chalmers	Australia	47.58 seconds

Table 3. Olympic gold medallists in all men's 200-metre freestyle swimming events between 2004 and 2016

Year	Gold medalist	Country	Time
2004	Ian Thorpe	Australia	44.71 seconds
2008	Michael Phelps	United States	1 minute 42.96 seconds
2012	Yannick Agnel	France	1 minute 43.14 seconds
2016	Sun Yang	China	44.65 seconds

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Chapter 6
Considerations for mathematics and science texts

Maths and science texts can be challenging for readers with print disability. An equation that can look simple to someone encountering it visually may be much more complicated when heard spoken by screen-reading software. And science texts are often accompanied by charts and graphs, which generally convey complex and rich information.

It is important to find ways to present the information in sufficient detail that readers with print disability can be confident they are interpreting the text correctly.

Mathematical expressions

The best available option for making maths accessible for screen readers is currently MathML. MathML is a universal format for maths that is easily convertible into visible, audible, tactile and machine-readable forms. It is supported in numerous formats, including (as of 2023) the Google Chrome and Microsoft Edge browsers.

Where possible, use an application that will allow you to create MathML equations, rather than equation images, to ensure that they are accessible to everyone. An example application is listed in the Resources at the end of this chapter.

Equations created in MS Word can be converted into MathML. Open "Format – Equation Options", and select "Copy MathML to the clipboard as plain text". This should allow you to copy equations as MathML code, rather than as an equation image.

When using MathML, test that the resulting speech text sounds correct, using a Read Aloud function. A visual check is not enough; the maths may look

correct but have errors in the unseen coding that appear when a screen reader is used. You may need to consult a subject matter expert to clarify what a complex equation is supposed to sound like in words.

While a lot of screen reading software supports MathML, there are always exceptions. Where MathML is not supported, maths expressions will need to be presented using an alternative format such as LaTeX (pronounced "lay-tech"). However, this is not ideal, as such formats are not considered accessible. LaTeX, for instance, is not designed to be read by a screen reader. Equations may be read out inaccurately, or in a confusing order.

Maths images with alt text

When writing simple maths expressions, rather than complicated equations, the maths can be rendered as an image with alt text (although this can be a dangerous habit to get into!). As a rule, MathML is preferable, but there are occasions where an image with alt text can be justified. Images are especially useful for short expressions that are likely to be ambiguous when read by a screen reader. For example, a screen reader will always read A^T as "A superscript T end superscript". If alt text is used, the writer can choose whether to say "the transpose of the matrix A" or "A to the power of T", depending on whether A is a matrix or a variable, respectively.

When writing alt text, make sure that the words match a single maths expression rather than multiple different expressions, which can create ambiguity and confusion. A subject expert must be involved when using this style of alt text, to ensure no errors are made.

For instance, "a plus b over c" will leave the user confused about whether $\frac{a+b}{c}$ or $a+\frac{b}{c}$ is intended. It is clearer to write "fraction a plus b over c" or "a plus fraction b over c".

(Refer to Part 3, Describing images and tables, for more information on writing alt text.)

Maths as ordinary text

When writing numbers larger than 999, use comma separators rather than spaces. This will ensure that a screen reader reads the number correctly.

Some symbols look similar to maths symbols but are interpreted differently by a screen reader. Ensure that the correct symbols are being used. For instance, use:

- a multiplication symbol (×) rather than a sans serif letter x

- a degree symbol (°) rather than a superscript zero (^{0}) or superscript letter o (^{o})
- a minus sign (−) rather than a hyphen (-) or dash (–)
- a proper square root symbol (√3) rather than the typed symbol without the top line (√3)
- a prime symbol ($f'(x)$) rather than an apostrophe ($f'(x)$).

When editing a text containing maths expressions, use the Find and Replace tool to find " x " (a letter x with a space on either side). The majority of instances will be either a deliberate algebraic *x* (which should be left as written) or intended as a multiplication symbol (which should be replaced by a true multiplication symbol). Do not simply hit "Replace all", or you will accidentally replace algebraic *x* signs. Also, remember to check manually that no instances have been missed, rather than relying purely on Find and Replace.

Within a paragraph, use the division symbol (÷) to indicate "divided by", rather than using a forward slash (/). The forward slash should be used to indicate "per". For example:

- 3*x* ÷ 2 ("three divided by two") should not be set as "3*x*/2" ("3*x* per 2")
- "km/h" is correctly set ("kilometres per hour").

Some fractions can be typed by inserting a symbol (for instance, "¼" rather than "1/4"). However, this is not possible for all fractions. Where a symbol does not exist, it is acceptable to use the forward slash (for instance, "5/7" to mean "five-sevenths").

Chemistry

When presenting information about the properties of an element, list the element's name before any properties (Figure 6.1).

Refer to the chapter Descriptions for different types of illustration for information on how to write image descriptions for chemical elements.

Figure 6.1: **Order of information for an element**

Caption: **Magnesium has the chemical symbol Mg, with mass number 25, atomic number 12 and charge of positive 2.**



Sonification

Converting visual data into auditory data (non-speech sound) is an alternative way of conveying information in a variety of scientific disciplines and beyond. This process, which is called sonification, can be used to interpret, analyse and communicate data and improve scientific literacy and numeracy for people with low or no vision. It is also helpful to auditory and neurodivergent learners.

For example, sonification can be employed in mathematics to translate graphs into sounds, with pitch used to represent the *y*-axis and time used to represent the *x*-axis. Apart from pitch, a tone, a rhythm or a different instrument can be used to distinguish different data. The sound can be either abstract or musical in nature.

Sonification must be developed as a collaboration between the author and a sonification expert. Technically, it can be produced as an audio file or video file that can be embedded in EPUB3 or online publications. To be useful and facilitate an understanding of the data, sonification must be accompanied by a clear description of what the different sounds represent and how the sonification works. It must also be accompanied by an accessible interface, so that readers can start and stop the audio or video file.

Sitting at the crossroads of art, music and science, sonification research has been underway for over 30 years. Even though research has shown that the auditory display of data can be an effective alternative or complement to data visualisations, this is still a field under development. There are currently no standards for the way data is mapped to sound, and the use of sonification in publications is in its infancy. Work on tools to create sonifications for educational purposes is in progress.

Resources

Accessibility 101: STEM Edition, LaTeX & MathML
California State Polytechnic University, Pomona, Creation of accessible mathematic equations
Equation creator (for creating MathML equations from LaTex), Formula Generator
Sonification software and apps:

- Desmos
- SAS Graphics Accelerator
- SenseMath

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Chapter 7
Considerations for children's books

Picture books and illustrated storybooks are highly visual publications that are designed to help children find enjoyment and meaning in a story. They also assist in laying key foundations for early literacy. Visually rich fiction and non-fiction publications continue to play a critical role in early and primary education, stimulating children to learn and understand complex concepts about themselves, their environment and the world around them. The text and images are closely linked, and this relationship is usually central to the reading experience.

Because of this reliance on illustration, especially in picture books written for emerging and developing readers, children with vision impairment or colour blindness may find the narrative difficult or impossible to follow without assistance. Their language skills are still developing. A verbal description of an illustration may therefore have little meaning or impact if it does not correspond with feelings or situations they have experienced.

Because of this, schools, teachers, caregivers and braille transcribers often supplement reading aloud with tactile versions of the illustrations so the child can still engage with the story. This can include touch-and-feel pictures, raised outlines, or physical three-dimensional props like the ant shown in Figure 1.8 (in the chapter, "Know your audience"). However, it can be difficult to create tactile illustrations if the text and images in the original do not easily lend themselves to tactile interpretation.

Ensuring that every page focuses on something that all children can access can also broaden the appeal of a book. In addition to following the principles for Writing and editing and Design discussed in these guidelines, making small, creative changes to language and illustrations can make it much easier for children with print disability to participate in a story and acquire equitable early literacy foundations. These changes can be made without any detriment to visual

learners. They may also benefit all young readers by providing greater clarity and descriptive detail, engaging more senses than just vision.

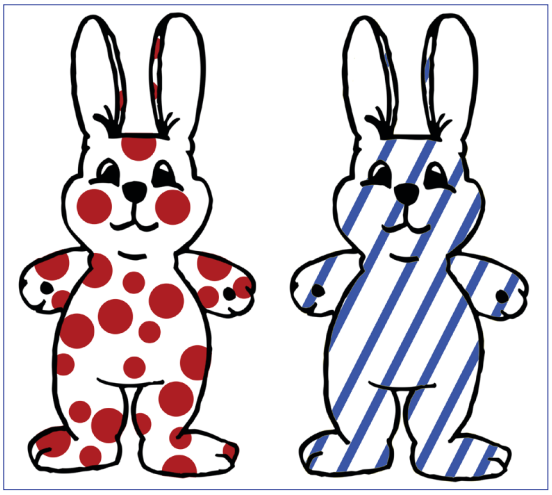
Meaningful language for children

The creative use of language can make a story more meaningful for children with print disability, as well as adding greater interest for all young readers:

- Encourage authors to use repeated words, rhyme or other engaging forms of language in read-aloud stories. These can make a story more interesting for children whether or not they are able to see the illustrations.
- Avoid purely visual descriptions or examples that may be abstract or meaningless for children with low or no vision. For example, in an alphabet book, the letter G could be for "grass". Grass can be touched, walked on and smelt even if it cannot be seen. The grass may be green in the illustration, but this feature will be meaningless to a young learner who can't perceive colour. Emphasising the concrete element ("G is for grass") rather than an abstract one ("G is for green") will ensure that all children can participate fully in the learning experience.
- If colour must be used to distinguish elements in a story, include features that can be perceived by feel too, rather than by vision alone. For example, in a story about coloured rabbits, the rabbits could also be given descriptors that can be rendered three-dimensionally so as to be tactile (the red spotty rabbit, the blue striped rabbit) (Figure 7.1a). The difference between them can then be understood by all children, irrespective of whether they can perceive the rabbits' colour or not. Including such features also provides a concrete foundation for teachers and caregivers to create simplified tactile versions of the illustrations (Figure 7.1b).
- Use descriptive, multisensory language wherever possible, rather than just referring the child to the visual illustration ("Jellyfish are like little, squishy, upside-down jelly bags that have strings coming out the bottom", rather than "Look at the jellyfish").
- Consider publishing teaching notes or resources that might include ideas for activities to help children engage further with the text.

Figure 7.1 Using three-dimensional descriptors for a picture book

(a) Two-dimensional illustration of a rabbit with red spots and a rabbit with blue stripes.



(b) Tactile, three-dimensional interpretation of the same rabbits.



Illustration and design for children's books

Illustrations support the development of literacy skills for all children, irrespective of whether the pictures are experienced visually or tactually. The images engage and hold the child's attention while the story is read to them. They also add elements to the story that are not explicit in the text, encouraging interpretation ("sign-reading") and participation rather than just passive listening.

Illustrating and designing books with the needs of children with print disability in mind involves small but significant adjustments that benefit all early learners. These adjustments will also make it easier for alternative-format providers, teachers and caregivers to create tactile versions of the pictures.

Considerations for illustrators include the following:

- Create simple, clear shapes and characters with distinct outlines.
- Make illustrations as uncluttered as possible, to avoid having too many tactile features on one page (which can make it difficult to interpret the illustration).
- Select views that avoid occlusion (where part of an object is hidden behind another) for very young children who have not yet learned about this concept. For example, in Figure 7.2, the horse on the left will have only one back leg and no recognisable head when its outline is traced with a finger. The horse on the right has 4 distinct legs and a long head

Figure 7.2: **Comparison of 2 illustrations of a horse, showing occluded and distinct views of its profile**



Source: **Pixabay.**

that will more accurately transcribe a true horse shape when its outline is traced.

- Include key features that can be translated into distinctive textures (such as an animal with a shaggy coat, or a house of rough bricks).
- Make foregrounds and backgrounds distinct from one another.
- Use clear, unembellished fonts (refer to the section Legibility and readability in the "Design" chapter).
- Use solid backgrounds behind text, with high contrast between the background and text to avoid distraction from the shape of the letters.
- Set text separately from the illustration. Where text is provided in speech bubbles and signs, it will need to be described in the alt text (refer to the chapter, "Writing effective image descriptions").

For example, Figure 7.3 is an illustration from a counting book for young children. The 6 lizards have been drawn with a black outline and striped backs. Each lizard has 4 distinct legs, a long tail and a similar, pear-shaped head. A simple, largely solid background has a strong colour contrast so that each of the illustrated figures stands out visually. The stripes and clear outline also make it easier for children to find each animal if a three-dimensional version of the illustration is created.

Figure 7.3: An illustration of 6 lizards drawn with clear outlines and stripes



Source: Kayt Duncan and Graham Evans (2021), *You can't scare me*, Library For All.

Also ensure the story narrative is provided as text, not as part of the image, so it can be read by children using assistive technologies.

Books with tactile elements for young children

Many of the shapes and cut-outs in board, concept and pop-up books rely on visual conventions that do not necessarily make tactual sense to readers with low or no vision, even when the pictures include tactile elements. They are likely to be based on what a sighted illustrator or designer imagines a blind person's process of image perception to be; that is, interpretation through the fingertips.

A child's experience of a three-dimensional object can be very different from the flat, outlined representation of it. Even when they are old enough to interpret the shape as a symbol, it can be difficult for children to identify similarly shaped objects by their outline if there are no distinguishing features. For example, they

may not be able to tell by touch alone whether the circle they can feel represents a coin, an orange, a ball or something else round.

Similarly, feeling the outline of an object such as a house for the first time will not be meaningful to a very young child who has never seen a house. The visual conventions for its shape (such as a rectangle with a triangle on top for the roof and a small protruding oblong for a chimney) are symbolic and don't convey any sense of how a house is experienced. A child's understanding of houses will derive from their own actions and non-visual perceptions, such as where and how they access their own house and their interaction with it. You enter a house through a door; it has windows that can be opened and closed, perhaps stairs to be climbed, and distinct rooms in which you eat, sleep, wash, relax and spend time with family. The house in Figure 7.4, for example, has a door handle that swings rather than turns, and windows that slide rather than push open.

To make books with tactile elements more inclusive for very young children with low or no vision, consider:

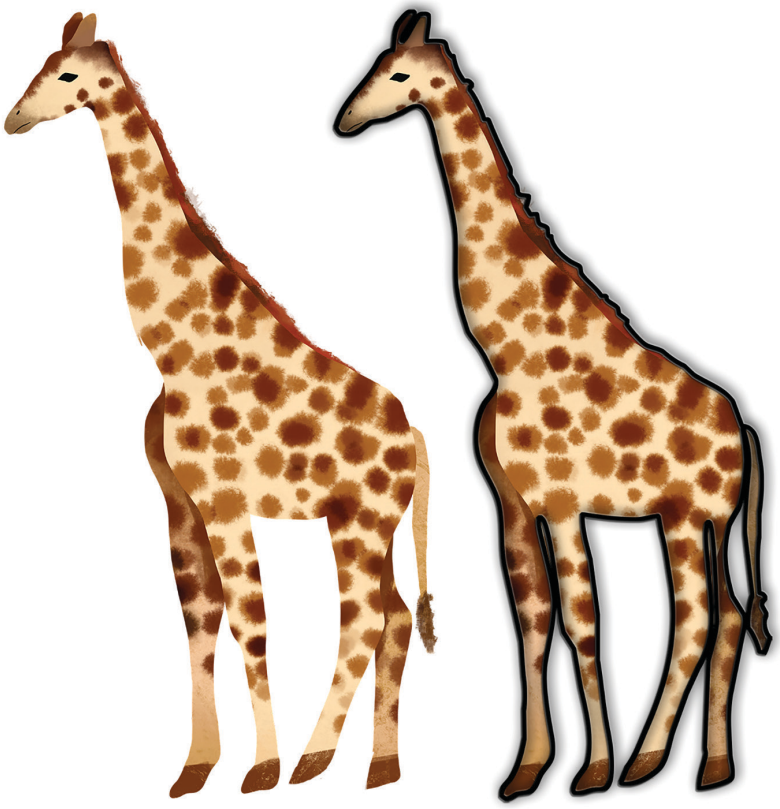
- choosing simple objects that have distinct outlines and textures, so they are easier to recognise and distinguish
- using the whole shape of the object rather than only part of it in the outline, so the child can learn to recognise it accurately

Figure 7.4: **A three-dimensional, interactive illustration of the front view of a house**



- showing figures and objects only from the front, in profile or from above, with relevant details such as limbs and leaves outlined clearly, so the shape is easier to recognise and to recreate as an embossed outline (Figure 7.5)
- adding moving features that can be understood through manipulation (such as a door that can be opened through a pull action, pop-up stairs the fingers can walk up or a handle that can be turned) rather than just an outline of the object
- using materials that correlate as closely as possible to the textures of the objects they represent (such as a crunchy gravel path, a leathery gumleaf or an animal's fur).

Figure 7.5: **The side profile view of a giraffe displaying 4 legs and 2 separated ears, which can easily be recreated into an embossable outline**



Source: **Pixabay.**

Digital formats for children

Digital formats offer opportunities to include accessibility features that can engage and entertain young readers with print disability. Apart from introducing children to the world of books, and cultivating reading skills, digital books also contribute to the development of technology skills. Different types of digital formats are suited to all types of children's books. In addition to reflowable and fixed-layout EPUB, children's books have also been created as picture book apps or interactive story apps that can combine text, visuals, audio and interactive design. Some of them cross the boundary between a book app and a game app.

Depending on the type of format:

- Ensure that digital books contain alternative text that describes the illustrations, and that the narrative is provided as text. EPUB files are able to hold multiple audio tracks, so readers can be given the option to "Read-along" or "Read-along with image descriptions". This is also possible in the case of apps, which provide an even greater variety of options to engage with the content (including Autoplay, Read to Me, Read Myself and Play mode), as well as the opportunity to record a parent's or a child's own voice.
- If possible, include synthesised voice or narrated audio with a read-along text-highlighting feature, to enable readers to follow along. The audible narration allows a child with no vision to hear the story, and offers children with low vision or letter and language learning challenges to apply sound to familiar visual letter and word patterns.
- Consider including sounds to accompany the text, such as ambient sound to indicate location or place and sound effects to highlight objects or action. This can assist with comprehension and provide meaning for what is written in the text or visible in the illustration.
- Include speed-control features, so the rate at which the text is read can be altered by the reader.
- In the case of reflowable EPUB, allow the text size, colour and typeface to be altered.
- Provide image descriptions (refer to Part 3, Describing images and tables).
- Ensure that the navigation and the location of hotspots in ebook apps are clearly explained and logical. This will allow readers with print disability to access different areas of the app, turn the pages and customise the configuration as required.

- Where practicable, consider offering 2 digital versions of the ebook: an accessible version in reflowable EPUB in addition to the principal version that has a more complex but less accessible layout, such as fixed-layout EPUB or an ebook app.

While digital books can contain multiple features and media enhancements, these extras can also create cognitive overload. This will have a negative effect on the reader's ability to understand the story and the text. It is therefore important to ensure that any interactive and audio features are closely aligned with the story and provide meaningful support to aid comprehension.

Audiobooks for children

When producing audiobooks for children, the key concern is that the story is engaging to listen to. If the book is written from the perspective of a child or an adolescent, for example, a narrator with a young-sounding voice may be best suited to tell the story. Similarly, any additional explanatory notes should be recorded in a style that is accessible to children and consistent with the voice of the rest of the book.

As with digital books, the addition of soundscapes such as music or sound effects will enhance the listening experience and help represent images.

For more information on best practice, refer to the chapter Audiobooks.

Resources

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Part 3
Describing images and tables

Chapter 8
Writing effective image descriptions

It is essential to provide appropriate image descriptions in digital publications. Without them, people using assistive technologies such as screen readers are unable to access illustrated content. The screen reader announces "image" when it encounters an illustration, but without a description the user has no way of knowing what is in the image.

An image description should convey equivalent information, and serve an equivalent purpose, to that of the image. Image descriptions can be provided in 2 forms:

- alternative (alt) text – that is, a brief description – for images that are simple or of medium complexity
- alt text with an additional long description for complex images.

Graphics come in many forms and are used for a wide variety of purposes. The level and complexity of an image description will depend on the purpose of the image and the requirements of the reader.

Preparation

Writing image descriptions can be time consuming, so plan ahead. The first step is to decide who will be responsible for drafting, finalising and checking the descriptions. This process should be included in the production schedule and budget.

Ask the production department about the best format in which to deliver the image descriptions and how they will be added to digital formats. Not all publishing systems have the capacity to include long descriptions for images, and alternative ways to provide them may be required (for example, in an appendix). The location of long descriptions in digital formats will also affect how they should be written and formatted. Check, for example, whether data tables can be included for graphs and charts.

Do not rely on the auto-generated alt text suggested by MS Word or most other programs. While they can be a useful prompt, the descriptions are not always accurate. The software also cannot anticipate which aspects of a picture are pertinent to the subject under discussion, nor will it supply extra detail when it is needed. (An exception, however, is the new generation of dedicated tools for STEM subjects that are powered by deep-learning and computer-vision AI algorithms. These have been used successfully to produce descriptions for charts, graphs, equations and other content typically associated with publications in mathematics, chemistry, physics, engineering, computer science, accounting and other areas.)

Information about what to include in the image description should be supplied at the manuscript stage by the people who best understand the context, meaning and purpose of the image. In most cases, this will be the author, the illustrator, the editor or a subject specialist. They are usually in the best position to identify the relevant details in the image, and ensure the information is accurate and the terms and language used are appropriate for the intended readers. However, for some publications such as art or children's picture books, the editorial and/or design team may be better placed to draft the image descriptions.

If an author, illustrator or subject specialist provides notes or a draft, the skills of the in-house team or a third-party vendor, such as a professional alt-text writer or an editor, may be needed to finalise the image descriptions. This will ensure the descriptions are not just accurate but also concise, with the information organised appropriately.

Publishers and alt-text writers may find it useful to keep a database of descriptions and templates for commonly used graphics (for example, maps, equipment or anatomical diagrams) in their subject area. However, remember that alterations may be needed if the context changes.

General principles

The following points are intended as guidelines rather than rules. They will vary depending on the publication and target readership. More detail on how to write image descriptions is provided in the chapter Steps for drafting image descriptions, and detailed examples are provided in the chapter Descriptions for different types of illustration.

Avoid using images of text

Where possible, present written material as text rather than as an image of text. Images of text are often used for design purposes, but they cannot be perceived when read aloud.

If using an image is unavoidable – a screenshot of a page, for example, or a photograph of handwritten material – treat the text like any other image and provide an image description for it. If the contents of the material are relevant to understanding the image, transcribe every word verbatim. If not, an overview or summary may be sufficient.

The use of images of ornate letters is a favourite of traditional children's stories, especially for opening phrases. In Figure 8.1, for example, the letter "O" looks attractive, and the word "Once" can still be read quite easily by many people without print disability. However, it doesn't make sense when accessed through a screen reader or braille device. As the user can perceive only the text elements, what is left is the phrase "nce upon a time", which is meaningless.

Adding alt text just for the letter "O" will create pronunciation problems, as the word will be heard as 2 sounds: "Oh" and then "nce". (Or worse still, a description of the appearance of the letter, making the phrase it decorates even harder to follow.)

If you need to use decorative letters, a better option may be to make the whole word into an image and provide alt text for it, even if only one letter is in a decorative typeface and the rest are in the same type as the body text. However, this solution will cause issues in reflowable EPUB if readers change the type size.

Figure 8.1: **A decorative letter "O" used to begin the phrase, "Once upon a time"**



Source: **Letter "O" by Janet Gooch, Pixabay.**

Describe all non-decorative images

Figure 8.2: A decorative border



Source: Border by Pixabay.

Provide descriptions for all images unless:

- the image is purely decorative, such as a border around text (Figure 8.2; but check that the text within the border is readable and not made part of the image)
- all the information in the image has already been provided in the text or caption
- the description would be incomprehensible or disruptive due to its complexity or length.

Mark an image that does not require a description as "Decorative" in the manuscript, either by using the checkbox if one is provided (for example, in the alt text window in Microsoft Office 365) or by using the word "Decorative" for the alt text.

If the caption already provides a sufficient description of a photograph, a few words may be all that is needed for the alt text. However, if the caption is missing or does not contain all the relevant details of the image, these should be described in the alt text (and in the long description if one is needed).

Provide equivalent information

The image description should provide the equivalent content and function to that of the image, so that a reader listening to the description receives the same key information as the reader who can see it. For example, describing the image in Figure 8.3 as "A spider on a human finger" would be technically correct. However, this omits other key information that the photo conveys, such as that the spider is tiny – a fraction of the size of a thumbnail – and colourful.

Be succinct

People with low or no vision experience greater strain on their working memory than sighted people when processing images. They have to assemble the image

Figure 8.3: Adult male *Maratus volans* on the thumb of scientist Jürgen Otto



Source: Photograph copyright © Jürgen Otto, Peacock Spider.org

in their minds based on a description, which can be overwhelming if too much information is included. To ensure image descriptions are useful:

- keep them as brief as possible
- break information and concepts into small chunks using succinct sentences or lists
- emphasise the key information, depending on the context and purpose of the image (refer to Step 1 in the chapter, "Steps for drafting image descriptions")
- omit details that are unimportant, irrelevant or potentially distracting.

For simple images, a short description may be sufficient. The ideal length for alt text is often described as being about the same as a tweet (approximately 280 characters), so as not to add anything that is not useful to the burden of reading. But if the image is very detailed, such as a diagram, a long description will also be required. Despite their name, the principle of succinctness applies to long descriptions too.

Avoid repetition and redundancy

Provide each piece of information only once. To avoid unnecessary strain on the reader's working memory, do not repeat in the alt text and long description

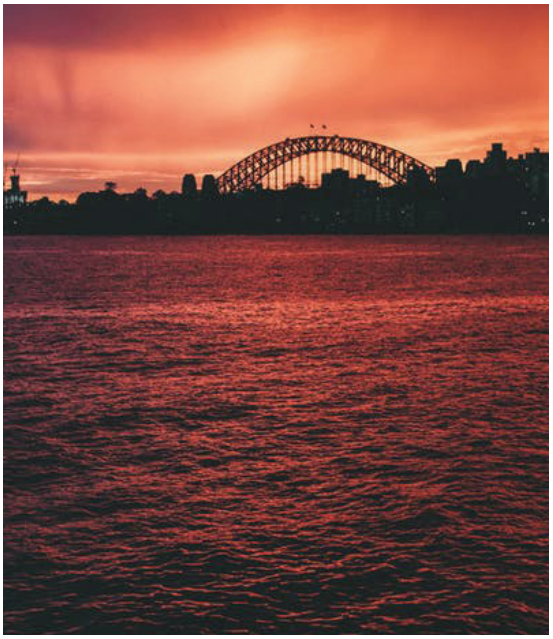


Figure 8.4: An informative caption that does not need to be repeated

Source: Photograph by Kate Trifo via Pexels.

Caption: Sydney's Harbour Bridge at sunset, seen across the water from Cremorne.

Alt text: Silhouette of an arched bridge and the tops of buildings against a dark red sky.

anything that is already in the body text, figure title or caption. Similarly, do not repeat in the long description anything that is already in the alt text.

For example, the caption for the photograph in Figure 8.4 already gives us the location and time of day. The purpose of the alt text is to provide further descriptive details. It need not state that the image shows the Harbour Bridge at sunset, as we've already been told this. (Naming the bridge or time of day in the image description would also constitute an assumption, as we cannot see the name in the photograph or tell whether it is sunset or dawn. Refer to the section Be objective for further information.)

Ensure descriptions are accurate and useful

Check that all key elements are described and that the description is correct and useful (and culturally appropriate, where necessary). This is especially important if a professional alt-text writer is not fully familiar with the topic or the context (Figures 8.5a and 8.5b). In such cases, they will need the author's notes to ensure the image description is accurate.

It is not usually necessary to state that an image is a photograph. For example, the image in Figure 8.6 would be described as "A sunflower", not "A photograph of a sunflower" (and in this case, the type of image is noted in the source line anyway). However, do include this information in the description if it

Figure 8.5: Images that could easily be misidentified



(a) The insect in the image is a moth, *Attacus atlas*. While a lepidopterist would know this, an alt-text writer who is not a subject specialist may confuse the insect with a butterfly because of its bright colouring.

Source: Pexels.



(b) A wallaby could be mistakenly described as a kangaroo by an alt-text writer who is not familiar with Australian fauna.

Source: Photograph by Valeria Miller via Pexels.

Figure 8.6: Descriptions for photographs



Source: Photograph by Peter Fazekas via Pexels.

would be useful for the reader to know the type of image being used, such as a bar chart or an electron micrograph, especially if a mixture of graphic types is used in the publication.

Be objective

Describe the graphic objectively. Do not:

- make judgements or assumptions
- attempt to interpret the image, unless interpretive details are needed to help the reader understand the content
- water down or censor content in the description.

In other words, describe only what can be seen in the image, without analysing or redacting it. People with print disability must be allowed to use their own judgement, and make personal choices about what content they wish to consume, just as readers who can see the image can.

The photograph in Figure 8.7, for example, is in black and white and we can see only the outline of the surfer. It is not possible to make an accurate statement about the location, weather or time of day, nor about the surfer's personal characteristics such as their age. All we can see is a person surfing the crest of a wave, so this may be the only description required in the alt text.



Figure 8.7: Describing an image without making assumptions

Source: Photograph by Jess Loiterton via Pexels.

Use suitable language and style

Use language that is appropriate for the intended reader and reading level, matching that used in the body text.

Write clearly and succinctly, using:

- present tense
- active verbs
- concise language
- correct spelling, punctuation and grammar
- the same style, spelling and terminology as the body text, referring to the house style guide (if there is one) and the copy editor's style sheet
- a consistent style of description throughout the publication, as far as possible.

Avoid:

- inappropriate vocabulary (for example, terminology that is too sophisticated or technical for the target reader)
- wordiness and irrelevant details
- ambiguous words or phrases
- biased language (words that imply personal judgement or interpretation)
- visual language that may present inaccessible concepts to some readers (for example, the terms "background" and "foreground" other than when describing works of art for adult readers)
- jargon (in books for general readership) unless it is essential; if a jargon word or phrase must be used, include an explanation of its meaning
- in educational texts, terms that are not defined or otherwise used elsewhere in the chapter.

Colour can be referred to where relevant, using familiar names (such as "red" rather than "scarlet"). If a specialised colour must be described, explain it by reference to familiar colours ("teal, a deep blue-green colour").

However, colour should not be relied on in descriptions to differentiate different aspects of the image. Where possible, focus instead on aspects of the picture that readers who can't see it will be able to perceive and understand, such as form and texture.

Transcribe any text in the image

Provide any text in the graphic in full in the image description. This can include captions as well as figure labels if a caption has been set within the image (for example, if the image is reproduced from another publication). Transcribe all

such text verbatim in the long description, as well as giving any other relevant information about the image, including the direction of reading (Figure 8.8).

Check questions based on images

Check that any issues or questions referring to images can still be understood and answered by readers if they can't see the picture. For example, if students will be unable to answer a question in a textbook without referring to a related image, either adjust the text or provide a suitable image description that gives readers who can't see the picture the information they need.

For example, a chapter on the meanings of signs and symbols may include questions that test students' knowledge and understanding. A student with

Figure 8.8: Description for an image containing text



Source: Pixabay.

Alt text: An exterior timber wall covered in rusting advertising plaques.

Long description: In circular order from bottom left, the plaques read: 100% pure paraffin base RPM motor oil; Drain and refill with Texaco motor oil; Barber shop; Drug store – Drink Coca-Cola, Delicious and refreshing; Finck's Overalls; Ivory Soap; Public telephone; Kayo; Genuine Ford mechanic on the premises; Cowhide brand overalls and pants; Drink Canada Dry beverages; Shell motor oil; Cover the earth – Sherwin Williams paints.



Figure 8.9: A question that cannot be answered without a description of the image

Question: What warning does this sign give?

Alt text: A red circle with a white centre. A red line runs diagonally through the centre of the circle, from the top left to the bottom right.

low or no vision will not be able to answer the question in Figure 8.9 without a description of the image.

However, be very careful to ensure the image description doesn't interpret the information. Students must be allowed to work out the answer for themselves; otherwise, the image description will defeat the purpose of the question.

Images for science, technology, engineering and mathematics

Images for science, engineering, mathematics and science (STEM) content that are not merely decorative will need to be presented as text, by:

- providing a description for the image or
- converting the information in the image into another format (for example, a table).

The Carl and Ruth Shapiro Family National Center for Accessible Media (NCAM) has published an extensive set of research-based guidelines on the effective description of STEM content. In addition to the general principles already outlined in this chapter, the guidelines recommend that image descriptions should:

- focus on the data presented, rather than extraneous visual elements (there is no need to mention the visual attributes of the image, such as colours or shapes, unless necessary; for example, supporting an exam question referring to these attributes)
- follow a drill-down structure (a concise summary, followed by expanded description and/or presentation of the actual data)

- represent information contained in graphs, pie charts and bar charts as properly tagged and structured tables, not as narrative description
- represent processes that are typically displayed visually as flow charts, diagrams and so on as nested lists
- mark up maths equations with MathML
- improve navigation by breaking the narrative description, using bullet points or lists.

Consider the author's intentions when images are used for educational purposes. How much information do they want the reader to be given, and how much do they want the reader to work out for themselves?

Where an image is being used to introduce a concept or new terms, the image description will need to include information that supports this purpose. For instance, if an image is introducing readers to the concept of lines of latitude and longitude, the description must explain how the lines look on a map (for example, "3 horizontal lines of latitude, labelled 10 degrees, 15 degrees and 20 degrees"). However, if the reader is assumed to be familiar with the concept, the description can be briefer ("latitude lines, labelled 10 degrees, 15 degrees and 20 degrees").

Resources

Accessible Publishing Learning Network, Best practices for writing image descriptions

Carl and Ruth Shapiro Family National Center for Accessible Media, Guidelines for describing STEM images

Cooper Hewitt, Smithsonian Design Museum, Cooper Hewitt guidelines for image description

The DAISY Consortium, Describing images in publications (webinar)

Diagram Center:

- Poet training tool
- Accessible image sample book

Round Table on Information Access for People with Print Disabilities, Guidelines for producing accessible graphics (2022)

University of Michigan Library, Describing visual resources toolkit

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Chapter 9
Steps for drafting image descriptions

When drafting image descriptions, consider the purpose of the image, the order of information and the level of detail required.

1. Identify the purpose of the image

Before deciding what to include in the description, the DAISY Accessible Publishing Knowledge Base recommends asking relevant "who, what, when, where, why and how" questions to interrogate the image:

- What is in it?
- Who is in it?
- What is happening?
- Where is it happening?
- When is it happening?
- Why is it happening?
- How is it happening?

However, include only those points that are relevant to the graphic and its context. It will not be appropriate or useful to address all of these questions in every description. Aim for a balance between completeness and economy, depending on the context and purpose of the graphic.

Make key details available to all readers, not just those using assistive technologies. If the author provides information relating to the image that is not necessarily apparent just from looking at it, provide those details in the body text or caption rather than in the image description.

2. Move from the general to the specific

Provide an overall description in the alt text. You can then provide more detail in a supplementary long description if further information is needed.

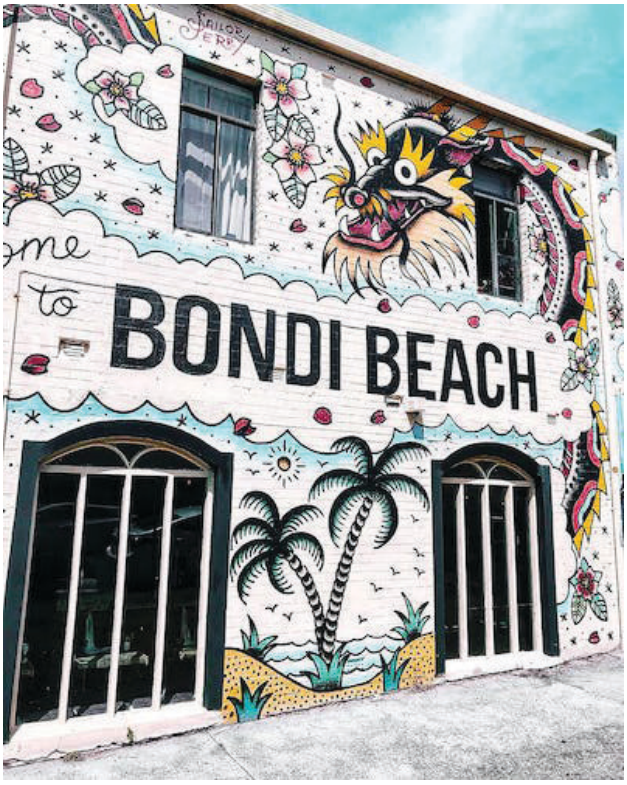


Figure 9.1: Using alt text to set the scene

Source: Photograph by Vincent Rivaud via Pexels.

Alt text: A two-storey building featuring a large mural with the words "Bondi Beach" in the middle.

Alt text

Use the alt-text to "set the scene" (Figure 9.1).

Long description

Use the long description to provide additional details if these will help the reader understand the image better (Figure 9.2):

- Provide the details in a logical order.
- Follow this order consistently rather than jumping around the image. (For example, the description could move from left to right, top to bottom or in a circular direction, or elements of information could be grouped together.)
- Separate information about each element into easily digestible parts, such as by using short sentences or line breaks.

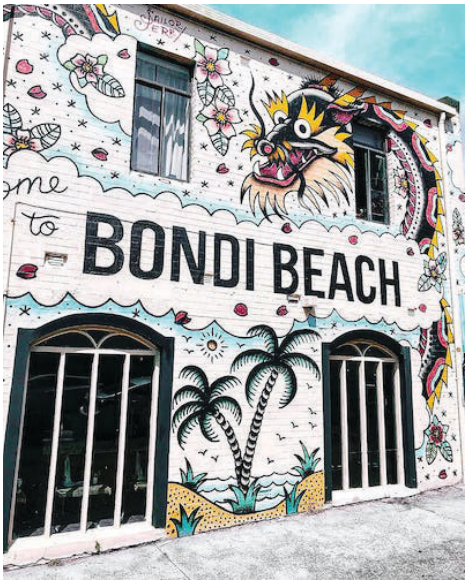


Figure 9.2: Using a long description to provide additional information

Source: Photograph by Vincent Rivaud via Pexels.

Alt text: A two-storey building featuring a large mural with the words "Bondi Beach" in the middle.

Long description: A wall of a building with 2 large, arched windows on the ground floor and 2 smaller windows on the upper floor. The wall is covered in a large mural of pictures and words on a white background. The bottom section of the mural lies between the ground-floor windows. It shows 2 palm trees on a curved beach with the sea behind and birds and the sun above. The central section of the mural is between the lower and upper windows. The words "Bondi Beach" are inside a scalloped oval shape surrounded by a light blue shading. Wrapping around the mural is a red, black and yellow dragon with large round eyes, long whiskers and triangular scales down its back. The dragon's head is between the top-floor windows and its neck curves over the right-hand window. Its tail runs down the right-hand side of the building and curls over the top left-hand corner towards the left window. Flowers and star shapes fill the spaces between the larger graphics.

3. Decide on the level of detail

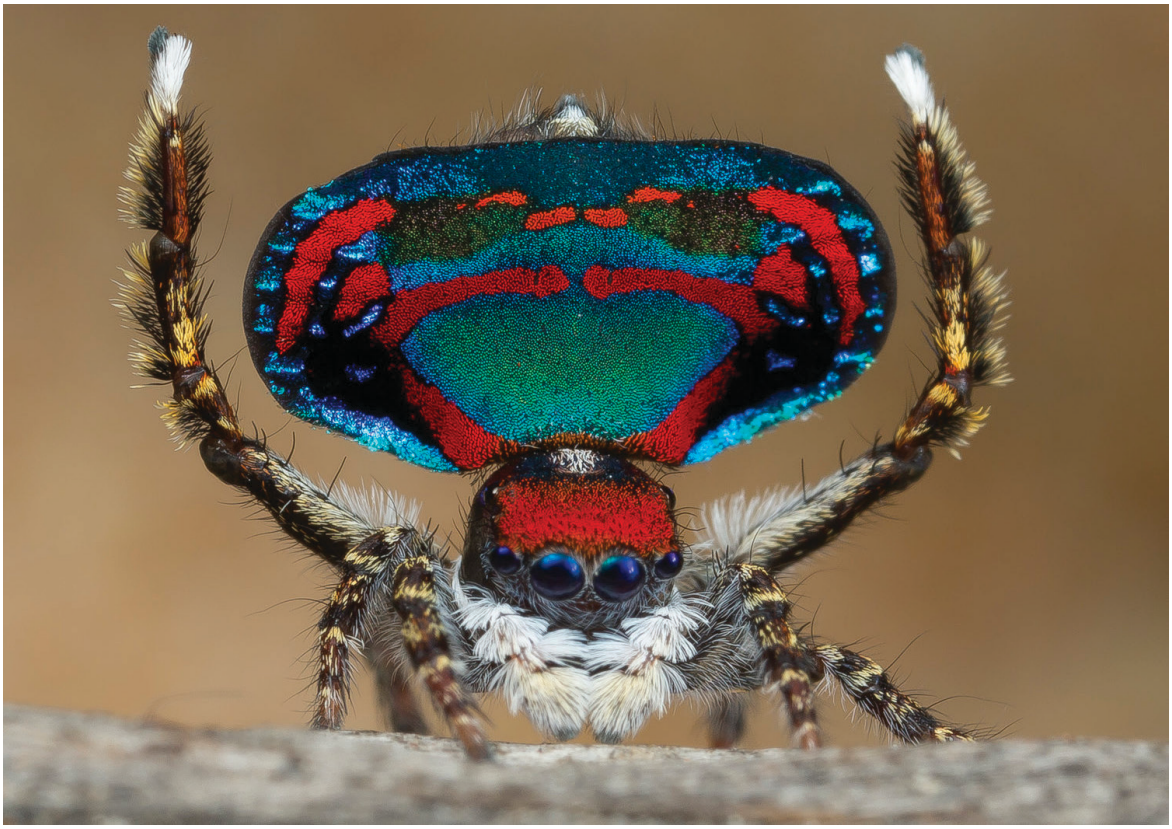
The amount of detail to include in the description, the terminology to use and whether a long description is required will depend on:

- the target readership
- the reading objective
- the purpose of the image
- how much information has already been provided in the body text and caption.

It is not necessary to describe every detail in an image. The object is to convey the core information as succinctly as possible. Some images may need just a few words to achieve this aim, while others may need an extended description to do so.

A photograph of a colourful spider, for example, could be described in different ways (Figure 9.3), depending on the intended reader. In all cases, however, the information is factual and no judgements (such as "cute" or "funny") are made about its appearance in the image descriptions.

Figure 9.3: Three alternative image descriptions of a male peacock spider, *Maratus caeruleus*



Source: Photograph copyright © Jurgen Otto, Peacock Spider.org

For a book on Australian fauna for secondary-school readers:

Body text: All peacock spiders are tiny: about as big as a grain of rice. They are called "peacock spiders" because of the way the male can spread out his colourful tail fan like a peacock. When a male spider wants to impress a female, he does a fancy dance. First, he lifts his tail in the air and spreads out his fan to show off his beautiful colours. He then starts to wiggle and jiggle, shaking his tail and waving one of his 4 pairs of legs above his head to get her attention.

Caption: A male peacock spider waving his legs and tail fan to attract a female spider.

Alt text: A spider with large eyes and eight furry striped legs. Two of its legs are lifted in a V-shape up above its head. Its blue and red oval tail fan is raised between its upright legs.

Long description: None.

Figure 9.3 continued

For a general interest article in a magazine for adult readers:

Body text: Peacock spiders are tiny creatures. The males have beautiful, jewel-coloured tails. Their glamorous displays of courtship involve swaggering, waving, jiggling, and other lively dance moves in the hope of impressing a female. When the male is aroused, 2 flaps fan out from either side of his raised abdomen, which he then shakes while waving his third pair of legs in a V-shape above his head.

Caption: A male *Maratus caeruleus* raises his abdomen flaps and third pair of legs and waves them to attract passing female spiders.

Alt text: Front view of a spider with large eyes, shiny blue, red and turquoise abdominal flaps and furry, striped legs. The flaps are raised and fanned out above the head, forming an oval shape. The third pair of legs are raised upright on either side of the flaps.

Long description: None

For an undergraduate biology textbook:

Body text: Australian peacock spiders (*Maratus* spp.) are members of the jumping spider (Salticidae) family. Males have flap-like extensions of the abdomen that can be folded down, or extended when used for display. During mating, the male raises its third pair of legs and its abdomen, then expands and raises the flaps so that the abdomen forms a circular field of iridescent colour. As a result, members of this genus, such as *M. caeruleus* (Figure 7.2), have been compared to peacocks.

Caption: Figure 7.2. A male peacock spider (*Maratus caeruleus*) using its colourful opithosomal extension to attract a female during courtship.

Alt text: Front view of a spider with its abdomen and third pair of legs raised vertically. The abdominal flaps are extended directly above the cephalothorax and fanned out in an oval shape between the raised legs.

Long description: The spider's abdominal flaps are iridescent blue, with red circular markings and a turquoise centre. The cephalothorax is black with a red centre. The 2 main eyes are located in the centre of cephalothorax below the red markings and above the palps. Two smaller eyes are located either side of the main eyes, with 2 more directly above and another pair in the centre of the cephalothorax, above the red markings. The palps at the front of the cephalothorax are covered in white hairs. The 4 pairs of legs are covered with striped black and tan hairs and have occasional black bristles that are longer than the hairs. The 2 front leg pairs and rear fourth pair are facing down. The third pair of legs are raised vertically and have white-tipped ends that extend above the top of the abdominal flaps.

References

The DAISY Consortium (n.d.). Decorative images, DAISY Accessible Publishing Knowledge Base.

Poet Training Tool (n.d.). How to describe images, Benetech.

University of Michigan Library (n.d.). Describing visual resources toolkit.

Chapter 10
Descriptions for different types of illustration

The selection of the image and the context in which it is published will influence the image description. This includes decisions about whether alt text is sufficient, or if an additional long description is needed and how much information it should contain.

Some of the information in this chapter is repeated from earlier chapters. This overlap is deliberate, to reinforce the principles described and illustrate how they may be applied to a range of different graphics in different contexts.

Photographs

The general principles for describing photographs are:

- If the caption and/or body text are sufficient to describe the photograph, you may need to provide only one or two words of alt text to identify the image.
- Include any text in the photograph verbatim.
- Depending on the context, the description may also include:
  - the setting or location
  - the surroundings
  - colour
  - the orientation of the objects (Figure 10.1)
  - the appearance of people and their clothing.

Images of people

When describing people:

- Avoid making assumptions or judgements; describe only what can be seen of a person in the image. If other details about them are relevant but are not visible physical features (for example, their ethnicity or



Figure 10.1: A description of a set of objects

Source: Photograph by Monstera via Pexels.

Alt text: A square parcel wrapped in white paper and tied with a red ribbon. Placed around the parcel are a pair of scissors, green leaves, red berries, a pinecone and a piece of ribbon. A tag on the parcel reads, "Open me".

country of origin), this information should be provided in the body text or caption so it is available to everyone.

- Identify the appearance of people in the image in only as much detail as is useful in the context. This may include their clothing, hair, skin tone, eye colour and prominent features.
- If a subject's appearance is not relevant, it may be more useful to keep the physical description to a minimum, and focus on what they are doing rather than what they look like.
- If physical appearance is described, do so consistently throughout the publication and be aware of the potential for bias (for example, describing women's clothing or hairstyles but not men's, or describing only non-Western items of clothing).
- Do not use food, beverages or other objects to describe the colour of someone's hair, eyes or skin.
- Do not use ethnic terms to describe skin; refer instead to light, medium-light, medium, medium-dark or dark skin tone.

Gender

The discussion of gender is an evolving and sensitive area. The following points provide some ideas on how references to gender in image descriptions may be approached. However, you may make different choices depending on the context in which images are used in your work.

In general, avoid making assumptions about the gender of a subject. Refer to a "person" rather than describing the subject as male or female, using the pronouns "they" and "them". Describe the subject's physicality through their features instead, so the reader can make their own inferences if they wish.

Gender may be mentioned where:

- the person's gender is verifiable (for example, a famous person or where the subject's gender is referred to in the text)
- it is clearly being performed in the image (such as an advertisement for men's fragrance featuring a deliberately "masculine" man)
- you consider it appropriate to the context (such as in some historical images).

For example, we have described the modern photograph in Figure 10.2 using gender-neutral language. However, we have chosen to use gendered language for some of the older examples in this chapter, to reflect the social norms at the time the artwork was created. We have also specified gender where it is mentioned in the text, such as in some of the images for children's books.

Figure 10.2: **Description of a person**



Source: **Photograph by Jan Vašek via Pixabay.**

Alt text: **A person looking at a laptop screen.**

Long description: **They have long brown hair and are wearing reading glasses. Their fists are clenched either side of their mouth, gripping the ends of a yellow pencil held horizontally between their teeth. A container of coloured pencils is to the left of the laptop.**

Works of art

The language used to describe art may be richer and more evocative than for other forms of image description, in order to give the fullest possible experience of the work (Figure 10.3).

- Where possible, base descriptions of an artwork on any statements made by the artist.

Figure 10.3: Description of a painting

Caption: Portrait of Joseph Deutz, Michael Sweerts, circa 1648–49. Oil on canvas.



Alt text: Painting of the head and torso of a young man.

Long description: The man has shoulder-length brown hair, brown eyes and light skin tone. He is wearing a brown doublet (jacket) over a loose white shirt with voluminous sleeves. The pleats of the shirt show through a gap in each of the upper arms of the doublet, and at the waist and cuffs. The man's body is at an angle, his head is turned towards the viewer and his brown eyes look directly at us. His left hand is on his hip and his right hand is held in front of his chest with the palm facing in, as if beckoning us to come closer so he can speak to us. The solid dark brown background is almost the same colour as his doublet. A strong light entering the picture from the young man's right illuminates his shirt, face and hands. The flashes of his white shirt and light skin form a circle of bright shapes in the picture that contrast sharply with the dark brown of the background and the man's doublet, hair and eyes.

- Describe what can be seen in the artwork, including colour (and the colour palette for paintings, such as greens and blues) and texture.
- Describe the style in which the artwork has been created where possible (if this is not already specified in the caption).
- Describe the relationship of objects within the work to one another (for example, to the right or left of the main subject), and their orientation.
- Consider using descriptions that appeal to the senses of sound, touch, smell and taste to support a richer experience of the artwork (for example, "crashing waves", "soft sand").
- Employ simile where comparisons may aid understanding of the work (for example "long and sinewy like a snake") without adding ambiguity.
- If the frame of a painting is visible in the image, describe that too.
- Identify whether an image is vertical (portrait) or horizontal (landscape) only if this information may help the reader understand the image.

Illustrations in cartoons, comic strips and graphic novels

Various genres tell stories through sequential art. General principles for describing the images include:

- Set the scene by describing the image in sufficient detail to make the situation clear, including the setting and characters.
- Use either a narrative or play script style to describe the action (and dialogue, if there is any) (Figure 10.4). The choice of style will depend on which version you feel will provide the most punch and match the tone of the narrative most closely.
- Transcribe speech and any other text verbatim.
- Keep the level of description to a minimum in cartoons, so as not to spoil the joke. Allow the action or dialogue to tell the story (as shown in Figure 10.5), unless the joke is in the image itself.
- Do not over-describe comic books and graphic novels either; this can distract the reader and detract from the narrative experience.
- For graphic novels, tell the story in a way that is as entertaining and easy to follow as possible. You do not need to describe every frame or image separately if doing so will not advance the storyline. Focus instead on the action across several frames if appropriate, especially if there is no dialogue in some of them.

Figure 10.4: Alternative descriptions for a comic strip narrative



Source: Jennifer Horn (2021), "Polly Ruffles".

Narrative description:

Alt text: Two pirates watching a ship sinking.

Long description: The first pirate has a wooden leg and a crutch. The second has a long beard and a bird on his shoulder. The first pirate says to the other, "Awf'ly sorry about yer ship, matey. Will ye shake a fellow captn's hand and we still be chums?" He holds out his hand to the second pirate, who crosses his arms and does not respond. The first pirate asks, "Wassa matter, matey, got a chip on the old shoulder?" The bird on the shoulder of Pirate 2 replies, "Ahem – I'm a parrot".

Play script style description:

Alt text: Two pirates watching a ship sinking.

Long description: Pirate 1: Awf'ly sorry about yer ship, matey. Will ye shake a fellow captn's hand and we still be chums?

[Pirate 1 holds out his hand. Pirate 2 does not respond.]

Pirate 1: Wassa matter, matey, got a chip on the old shoulder?

Bird on shoulder of Pirate 2: Ahem – I'm a parrot.

- Use vivid language that is in keeping with the tone and pace of the narrative.
- Edit or omit details or language if necessary to keep to the essence of the graphic.
- Describe the prominent physical features of the characters. This is especially important where facial and bodily expressions are used to indicate personality (such as an anime character having exaggeratedly large, expressive eyes to indicate that they are "good").

Figure 10.5: Description of a political cartoon



Source: "The Scapegoat" by Scottish social and political cartoonist Cynicus (1893).

Alt text: A cartoon shows 3 men piggy-backed one on top of the other.

Long description: The men are all wearing top hats and tailcoats. The man on the top level of the piggy-back is looking over his right shoulder and winking. He has his left hand around the throat of the man beneath him and his right hand in the man's pocket. On his hat is written "The landlord". The man in the middle faces forwards and has his eyes shut. He has his own left hand around the throat of the man beneath him and his right hand in that man's pocket. On his hat is written "The shopkeeper". The man at the bottom is bent over and leans on a walking stick. He is thinner than the others and has lines on his face. His head faces down and his eyes are shut. On his hat is written "The customer".

- When describing an emotion, describe the features that denote the emotion if this adds to the narrative. For example, characters may be drawn as having furrowed brows, flared nostrils and clenched fists to show anger. This may be mentioned the first time a character shows anger, but then from then onwards just name the emotion ("She looks angry"), to avoid repetition.

- Do not include information that is not available to sighted readers when describing historical and political cartoons, unless the joke would be lost without it (for example, characters who can be identified by their appearance but are not named in the graphic).
- For foreign language graphics, describe the scene and characters in English but render any dialogue verbatim in the language used in the original, so that all readers experience the text equitably.

Illustrations in books for children

The purpose of illustrations in fiction and non-fiction books for children is to stimulate and engage younger audiences, adding to and enhancing concepts outlined in the text. Text and illustration are equally relevant to the reading experience, as the illustrations often provide clues about how to interpret the text. The chapter Considerations for children's books discusses picture books in more depth and accessibility considerations for the different age groups they cater to.

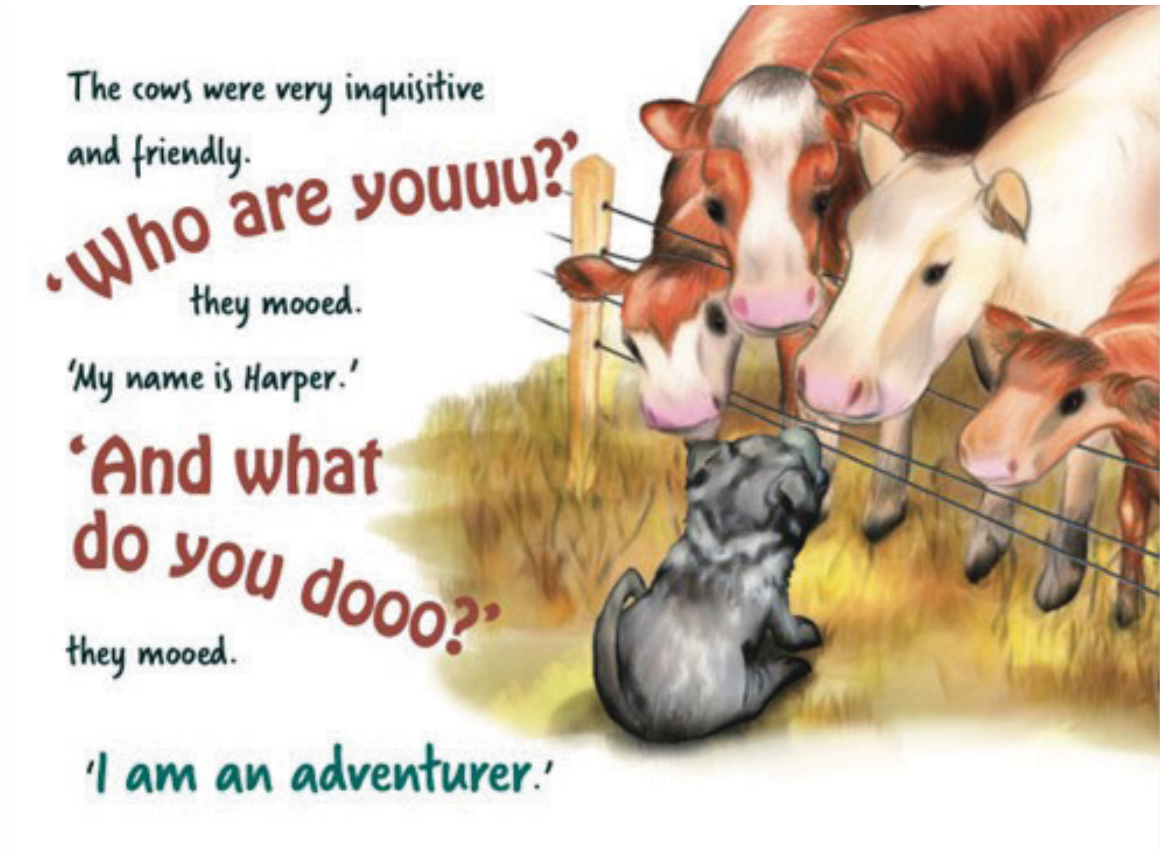
When working with picture books, always keep in mind the audience and target age group of the publication, and the purpose of the illustration being described.

Use an appropriate level of detail

Be as brief and concise as possible:

- State only what can be seen in the illustration. Illustrations provide clues about the text that a child is learning to read. They are not intended to extend the written narrative, so the image description should not do so either.
- Focus on details that are important to the story and that will keep the narrative flow moving.
- Do not repeat descriptive details that are already in the text. For example, the image description for the illustration in Figure 10.6 does not reproduce the conversation between Harper and the cows, or mention the cows being inquisitive and friendly. Instead, it focuses on physical details that support the text, such as the cows reaching their heads over the wire and bringing their faces close to Harper's.
- Focus on tactile details such as shape, space and texture that can be understood by a child who has low or no vision.

Figure 10.6: Using an image description to support the text without repeating it



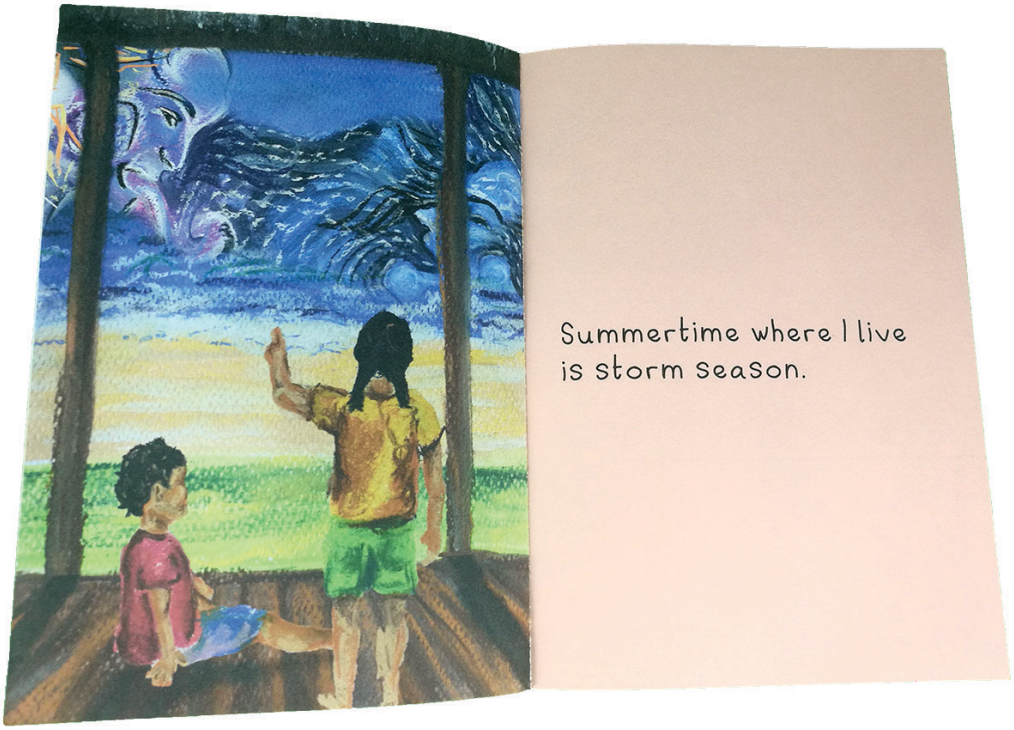
Source: John McLaughlin (2022), *Harper's tail of adventure*, Gannadoo.

Alt text: Harper sits on one side of a wire fence looking up at 4 cows. The cows stand side by side on the other side of the fence. They lean over the fence and talk to Harper.

Long description: The cows are much taller than Harper. They have big heads and long noses. They reach their heads over the fence and bring their faces very close to Harper's head as they speak to her. The nose of one cow is almost touching Harper's nose.

- Do not refer to colour in picture books for early learners. Colour is an abstract concept for children who are blind that is not introduced until they are older.
- Keep it simple. When illustrations for young children include complex or abstract elements, a literal description can be confusing. Instead, use the simplest description possible to give the child an equivalent sense of what is in the picture, as for the storm in Figure 10.7.
- Mention the style of illustration (painting, drawing, collage, cartoon) in the first image description for older readers. This information can often be included in the description for the cover or title page illustrations,

Figure 10.7: A simplified image description of an abstract illustration of a storm



Source: Kayt Duncan and Eiler Brennan Pitt (2020), *Summertime Storm*, Library For All.

Alt text: Two children looking at a dark and stormy sky. One child sits on the ground. The other child stands and points at the storm.

Long description: The children are barefoot. Both are wearing shorts and t-shirts. From a wooden shelter, they look out across bright grass and sand towards a sky filled with dark clouds and wild rain. The clouds move as though a giant face were in the sky, blowing them around.

leaving the body of the book to focus on key details about the story. However, referring to the style of illustration is not appropriate in books for young children, as the concept will not be meaningful to early readers.

Use appropriate language for children

Mirror the language, tone and reading level of the story in the image descriptions:

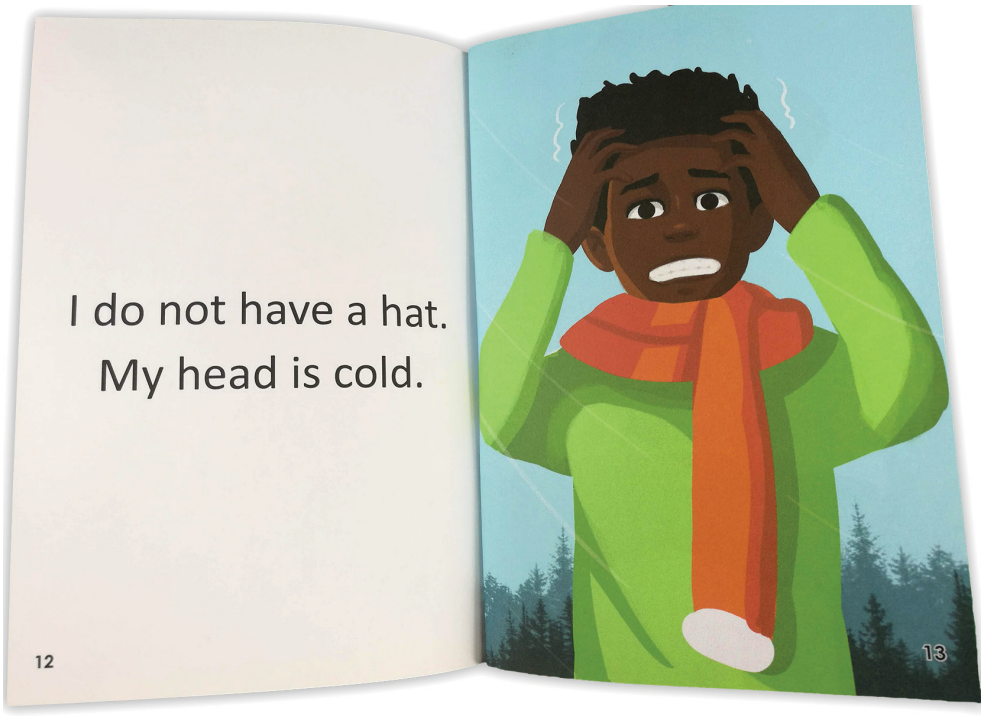
- Use simple but vivid language. This includes descriptions for the cover images as well as those in the narrative.

- Ensure the vocabulary is appropriate for the target reading age, rather than that of an adult reading to the child. The image description should offer simple, age-appropriate clues to the words the student is learning to read.

For example, the image in Figure 10.8 is from a book for a Level 2 reader. The illustration is designed to support students' understanding of the words. The language used in the image description describes the boy's appearance in simple terms that are suitable for an early reader.

- Use active verbs and the present tense, to keep the story moving.
- Avoid language, expressions or concepts that may create confusion (for example, if adjectives do not relate to recognisable features or the scene description is too abstract or complicated).

Figure 10.8: **An image description suitable for Level 2 readers**



Source: Kayt Duncan and John Maynard Ballinggao (2020), *I have a hat*, Library For All.

Alt text: **A boy stands outside. He is wearing a jumper and a woolly scarf and is holding his hands to his hair. His eyes are open wide and his teeth are shut together tightly.**

Set the scene

Set the scene at the beginning of the story:

- Focus on aspects of the scene that are relevant to the story.
- Avoid repeating any description of the scene that is already given in the text.
- Describe the scene only once, unless it changes and the changes are relevant to the flow of the narrative. For example, the illustrations in Figures 10.9a to 10.9c) are similar, featuring a father and daughter around a campfire. However, the state of the fire changes subtly from one illustration to the next. The heat rising from the fire is an important feature of the narrative, so this must be explained in the image description.

Figure 10.9: A sequence of illustrations featuring subtle changes within the same setting



Source: Kayt Duncan and Graham Evans (2020), *Martha Fellows' marvellous marshmallows*, Library For All.

(a) First, the outdoor night time campfire scene is established.

Alt text: A man stands behind a campfire, pointing towards the sky. A girl sits next to the fire, holding marshmallows on a stick over it.

Long description: It is a clear night in a forest. There are stars in the sky. Smoke rises from a pyramid-shaped fire that is burning within a ring of stones. Small bright flames leap from the stacked sticks. The man stands behind the fire with one hand on his hip and the other raised in the air, with one finger pointing at the sky. His eyes are closed, his eyebrows are raised and he has a wide smile. The girl also has her eyes closed and she is smiling. She sits on a large log that lies close to the fire, holding a three-pronged stick covered with marshmallows over the flames.

Figure 10.9 continued



(b) In the second image, the activity within the setting is made clear.

Alt text: The man pokes the glowing fire with a long, thin stick. The girl stands opposite him. She smiles happily as she holds the stick of marshmallows upright above the fire.

Long description: The fire is now dark at its base, red hot in the middle and bright yellow on the surface. There are no longer any flames, and the light of the fire extends only a small distance from the burning sticks now lying flat. The man stands to the side of the low fire, pushing the end of his wooden stick into the centre of it. The girl smiles broadly, showing all of her teeth. Her jumper has a star shape on it, in the middle of her chest. The star is also smiling.



(c) In the final image, the effect the state of the fire has on the activity is highlighted.

Alt text: The girl looks down in shock at the stick of marshmallows she is holding. The marshmallows are melting and dripping into the fire.

Long description: Heat rises as zigzags of orange and yellow from the burning wood. The girl holds the stick of marshmallows in one hand, pointing the marshmallows into the zigzags and down towards the fire. The marshmallows are melted together in a big, gooey, runny mess. The girl's eyes are wide and her mouth is open. Her other hand is raised and her head is tilted backwards, away from the hot fire. There is a red line across the top of both of her cheeks.

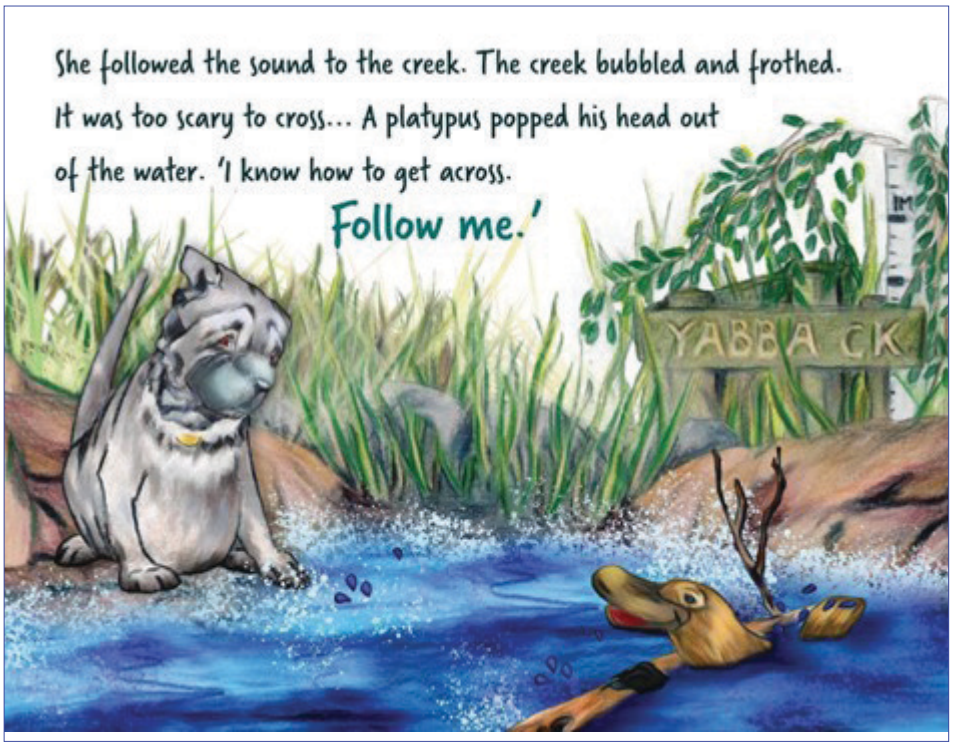
Introduce the characters

Describe each character the first time they are introduced. Remember that a character may be introduced visually before they are mentioned in the text.

- Do not repeat details that are in the text.
- Do not mention a character's name before it is used in the story text. Until then, use something that will identify them to the reader each time, such as "the dog wearing glasses" or "the man in long trousers".
- Describe characters only once, unless something in their appearance alters, such as a change of clothes or a new haircut. For example, in Figure 10.10 the dog, Harper, is the hero character. Harper has previously been introduced, but this is the first time the platypus character has appeared.

Figure 10.10: **Introduction of characters in a picture book (double-page spread)**

(a) **Left-hand page**



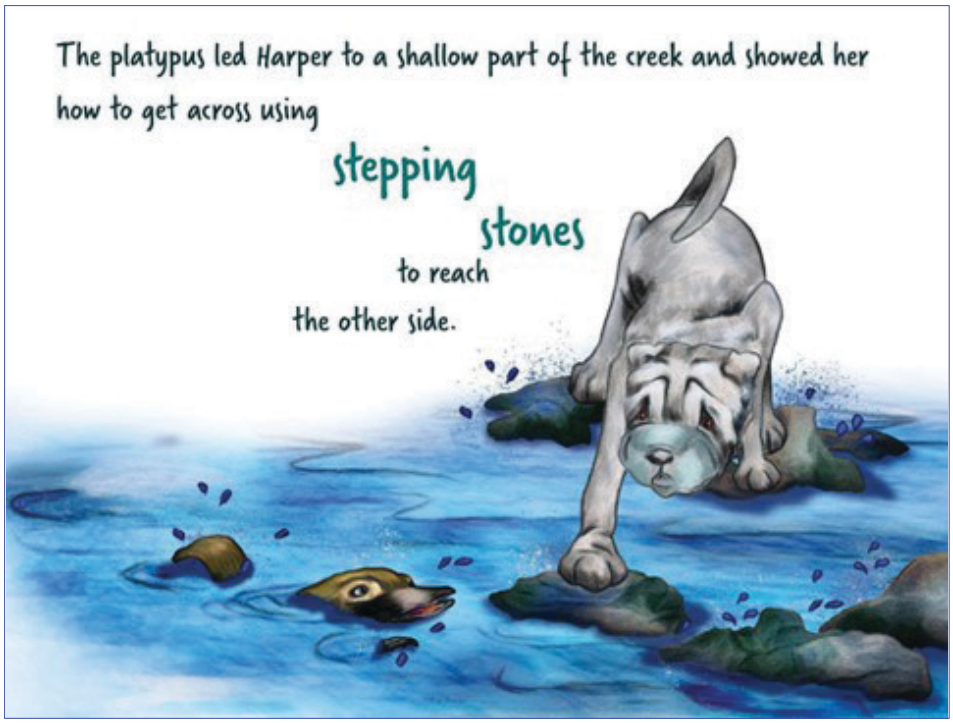
Source: John McLaughlan (2022), *Harper's tail of adventure*, Gannadoo.

Alt text: Harper sits by the side of a creek. She is frowning. A platypus is talking to Harper.

Long description: The platypus has a big wide, flat hard nose like a duck's bill, a furry body and webbed feet. He is swimming in the middle of the creek, holding onto a piece of wood and looking back at Harper.

Figure 10.10 continued

(b) Right-hand page



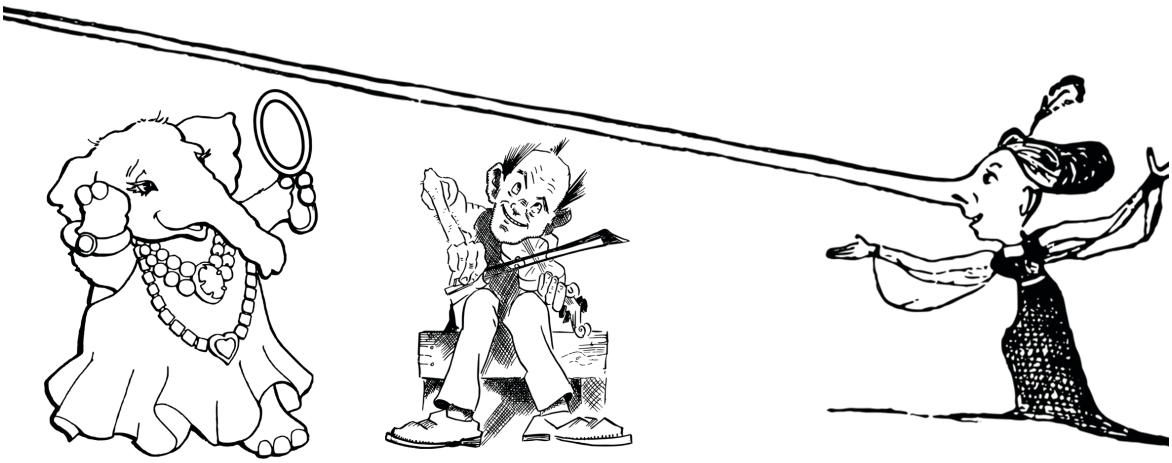
Source: John McLaughlan (2022), *Harper's tail of adventure,* Gannadoo.

Alt text: Harper balances on some rocks that stick out above the water while the platypus swims nearby.

Long description: Harper's front paw reaches out to step onto another small rock in front of her. Her body is hunched, her shoulders are above her ears and she is frowning even more. The platypus swims near the rocks. His head is out of the water and his tail and front flipper make little splashes.

- Focus on details that distinguish characters, for example by their physical characteristics (such as having "very long arms" or "wavy hair") or by clothes or other specific items (such as "the boy with the ragged blanket" or "the elephant wearing the straw hat") (Figure 10.11).
- Identify each character consistently in subsequent image descriptions.
- Describe characters' body language and facial expressions, as well as naming the emotion. (For example, "Maria is sad. The corners of her mouth are turned down and there are tears in her eyes.") Understanding emotions is an important part of what picture books teach young children. A child with no or low vision can understand from their own experience what a smile or a frown or tears are, even though they may not have seen them on someone else.

Figure 10.11: Description focusing on the distinct characteristics of each character



Source: Pixabay.

Characters can be described by any kind of physical characteristic that will be relatable to the audience. The image description for this cartoon might be as follows:

Alt text: A cartoon shows 3 characters in a row, from left to right: an elephant in a dress, a man playing the violin and a woman with a long nose.

Long description: The elephant is wearing a long, flowing dress and a big, beaded necklace. It stands on 2 legs, admiring itself in a hand-held mirror.

Next to the elephant is a smiling man with a tuft of hair in the centre of his balding head. He sits on a bench with his knees together and his feet pointed outwards. The violin is tucked under his chin and he draws a bow across it.

Next to the man is a woman whose nose is so long that it reaches over the heads of both the man and the elephant. The woman's hair is tied back in a bun, with a feather plume adorning the top of her head. She wears a long dress that has a train and puffy sleeves. She looks towards the elephant and the man with her arms spread wide.

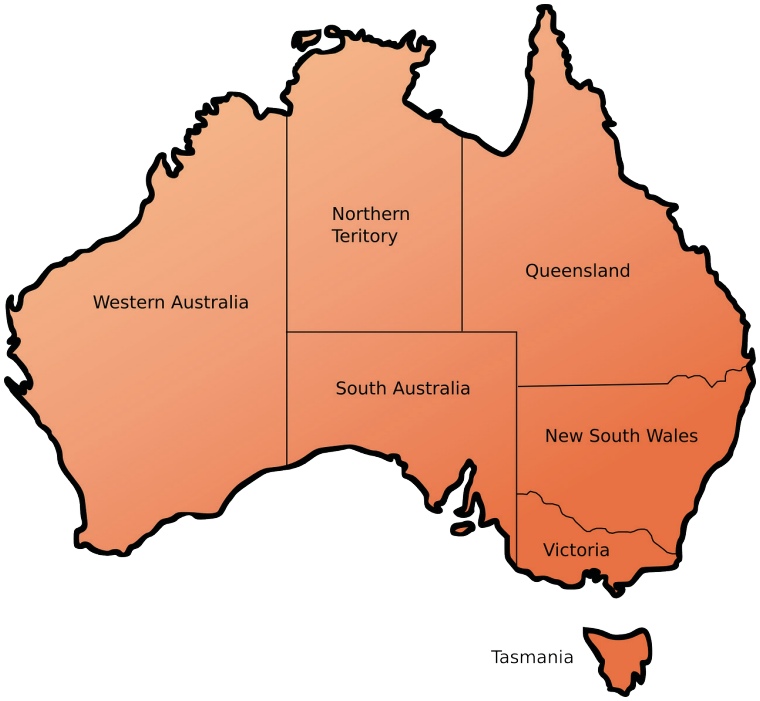
Maps

The amount of detail provided will depend on the context and the function of the map. Simple maps or maps for younger readers may only need a short description or summary, whereas others will need a greater level of detail and complexity.

- Provide a summary of the map before going into the details.
- Give all labels on the map verbatim.
- Describe the map in a logical, structured way, separating information into blocks.

- Describe labelled areas of land and water, and their relationships to each other, where relevant.
- Use north, south, east and west to refer to directions (for example, south-west of the city) rather than above, below, right and left (Figure 10.12).
- Describe lines as vertical, horizontal, diagonal, curved and so on.
- Write out units of distance in full (1,000 kilometres, not 1,000 km). Abbreviations add to the cognitive load of listeners and can cause confusion for some people with print disability.
- Include lines of latitude and longitude and their corresponding degrees if appropriate.
- Describe and differentiate coloured areas of the map.

Figure 10.12: **Description of a map of Australia**



Caption: **The state and territory borders of Australia.**

Source: **Pixabay.**

Alt text: **A map showing Western Australia, Northern Territory, Queensland, New South Wales, Victoria, Tasmania and South Australia.**

Long description: Described clockwise from the west:

Western Australia occupies approximately a third of mainland Australia on the map, stretching from the north to the south coast in the west of the country. It shares its north-eastern border with Northern Territory and its south-eastern border with South Australia.

Northern Territory occupies the centre-north section of the mainland. It shares its eastern border with Queensland, its southern border with South Australia and its western border with Western Australia.

Queensland occupies the north-east section of the mainland. It shares its southern border with New South Wales, its south-eastern corner with South Australia and its western border with Northern Territory.

New South Wales covers approximately three-quarters of the south-east section of the mainland. It shares its northern border with Queensland, its southern border with Victoria and its western border with South Australia.

Victoria covers the southern quarter of the south-east section of the mainland. It shares its northern border with New South Wales and its western border with South Australia.

Tasmania is a small island directly south of Victoria.

South Australia occupies the centre-south section of the mainland. It shares its western border with Western Australia, its northern border with Northern Territory, its north-eastern corner with Queensland, its mid-eastern border with New South Wales and its lower-eastern border with Victoria.

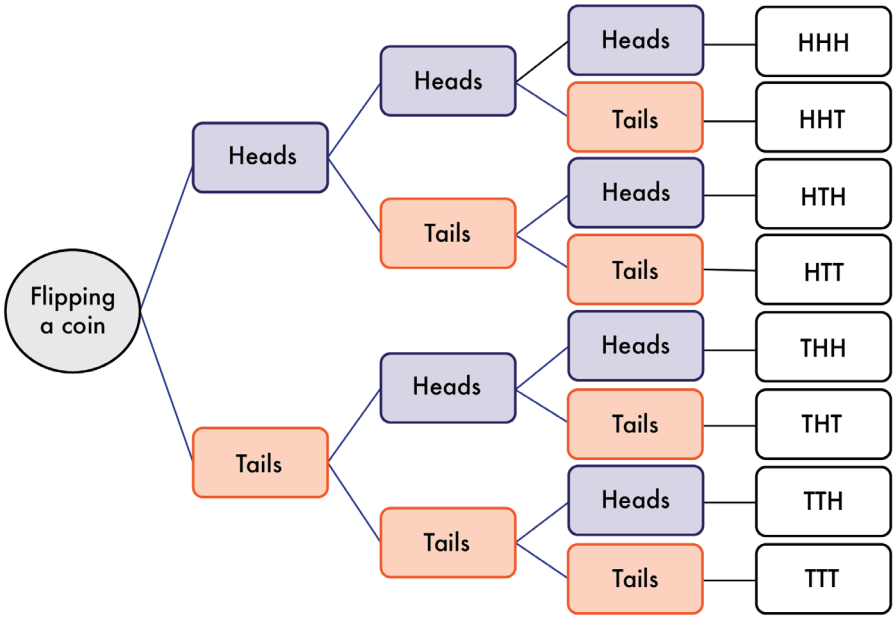
Tree diagrams

When describing tree diagrams:

- Concentrate on the relationships between the elements in the tree rather than the layout of the diagram.
- Give an overall description of the diagram before describing the individual elements and their relationships at each level.
- Use alt-text descriptions for primary school texts, simple bullet lists for high-school and general texts (Figure 10.13) and nested lists only for academic, tertiary or professional texts.

Figure 10.13: A tree diagram for high-school and general texts

Caption: The possible outcomes of a coin flipped 3 times in a row.



Alt text: A horizontal tree diagram shows 8 possible combinations of heads and tails.

Long description: The diagram moves from left to right. Each time the coin is flipped the result is either heads or tails. The possible outcomes of flipping a coin 3 times are:

- heads, heads, heads
- heads, heads, tails
- heads, tails, heads
- heads, tails, tails
- tails, heads, heads
- tails, heads, tails
- tails, tails, heads
- tails, tails, tails

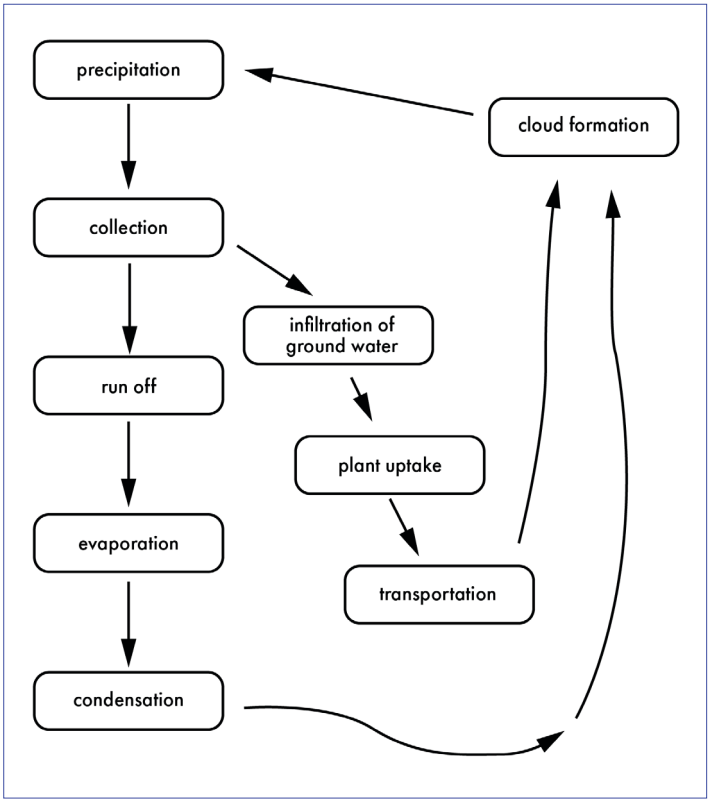
Flowcharts

Flowcharts can be simple or complex. For all charts:

- Provide an overview of the diagram, including the direction of flow if necessary, before describing the components of the process.
- Establish the start and end points for circular flowcharts, and note if the diagram has more than one start point.
- Describe the main flow routes succinctly.
- Organise the chart into linear, nested lists (bullets or numbered, whichever is best suited to the content).

- Break complex diagrams into multiple descriptions.
- Do not describe the appearance of the chart (such as colours, the shape of arrows and boxes) unless this is relevant. Focus instead on the function of the arrows, using phrases such as "leads to" (Figures 10.14 and 10.15) or "arrow to" and "If no/If yes".

Figure 10.14: Description of a simple flowchart



Caption: The water cycle.

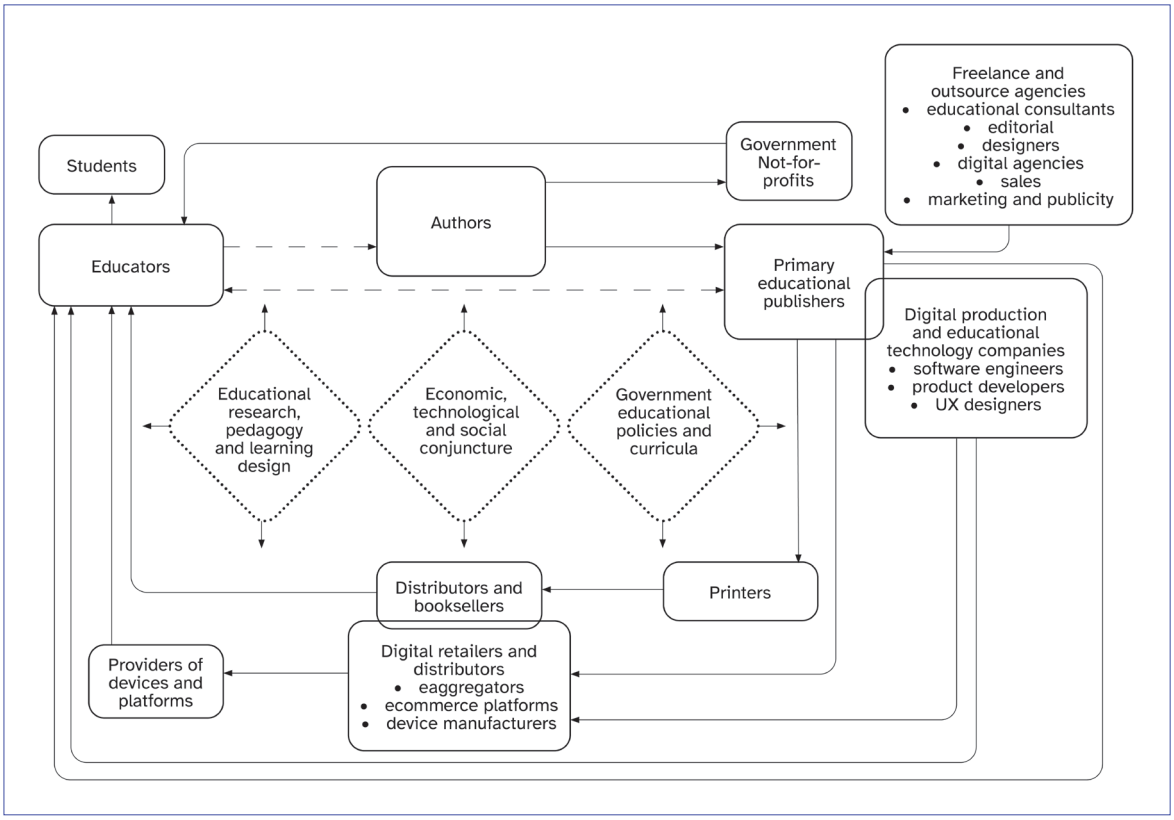
Alt text: A circular flowchart shows 2 routes to cloud formation and precipitation.

Long description: The flowchart leads downwards to a cyclical process. Here the process is described as a nested list of steps that begin and end with precipitation:

1. Precipitation leads to collection.
2. Collection leads to cloud formation by 2 routes:
    a. Run off:
        i. Run off leads to evaporation.
        ii. Evaporation leads to condensation.
        iii. Condensation leads to cloud formation.
    b. Infiltration of ground water:
        i. Infiltration of ground water leads to plant uptake.
        ii. Plant uptake leads to transpiration.
        iii. Transpiration leads to cloud formation.
3. Cloud formation leads to precipitation.

Figure 10.15: Description of a complex flowchart

Caption: The primary educational publishing communication circuit, adapted from Robert Dartons's communication circle (1982).



Source: Grace Reid and Agata Mrva-Montoya (2023), "Partners in education": primary educational publishers' understanding of their role, *Book 2.0*, 12(1).

Alt text: The diagram illustrates the circular relationship between different stakeholders involved in the educational publishing process as a series of linked boxes surrounding the 3 central forces. The relationships begin and end with educators.

Long description: The middle of the diagram shows the 3 central forces impacting educational publishing:

1. educational research, pedagogy and learning design
2. economic, technological and social conjuncture
3. government educational policies and curricula

These are surrounded by stakeholders involved in the publishing value chain:

- educators
- authors
- government and not-for profits
- primary educational publishers
- freelance and outsource agencies
- digital and educational technology companies
- printers

- distributors and booksellers
- digital retailers and distributors
- providers of devices and platforms

Educators lead to:

- students (direct line)
- authors (broken line)
- primary educational publishers (broken line that also points back to educators)

Authors lead to:

- government and not-for-profits
- primary educational publishers

Government and not-for-profits lead to educators.

Primary educational publishers lead to:

- printers
  - printers lead to distributors and booksellers
  - distributors and booksellers lead to educators
- digital retailers and distributors (e-aggreagators, ecommerce platforms, device manufacturers)
  - digital retailers and distributors lead to devices and platforms
  - devices and platforms lead to educators
- educators

Freelance and outsource agencies lead to primary educational publishers. These agencies are:

- educational consultants
- editorial designers
- digital agencies
- sales
- marketing and publicity

Primary educational publishers overlap with digital production and educational technology companies, which are:

- software engineers
- product developers
- UX designers

Educational technology companies lead to:

- digital retailers and distributors (e-aggregators, ecommerce platforms, device manufacturers)
  - digital retailers and distributors lead to devices and platforms
  - devices and platforms lead to educators
- educators.

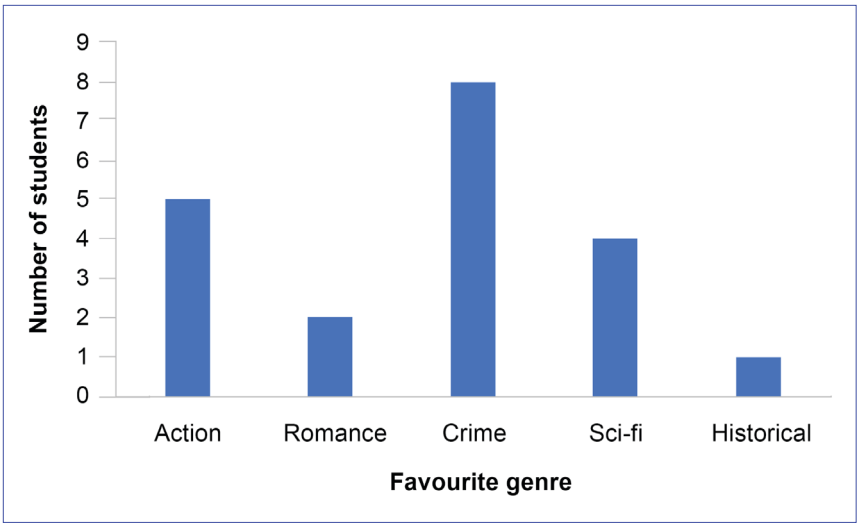
Graphs, bar charts and pie charts for general use

When describing charts for texts other than maths or science:

- Give an overall description of the graph or chart, including the type of graphic, the main elements or coordinates and a summary of the contents if possible.
- Describe the overall trend in bar charts (Figure 10.16).
- Provide the axis and any other labels in the graphic. It is not necessary to italicise elements such as x and y. (It is not possible to format alt text for elements such as bold and italics, and they are not meaningful to listeners anyway.)

Figure 10.16: Description of a bar chart

Caption: Types of novels preferred by students in Class 9B.



Alt text: A bar chart shows 5 genres of novel and the number of students who prefer reading each genre. The genres are action, romance, crime, sci-fi and historical. Crime novels are the most popular and historical novels the least.

Long description: The y-axis shows the number of students, ranging from 0 to 9. The x-axis shows the favourite genre:

Action: 5 students

Romance: 2 students

Crime: 8 students

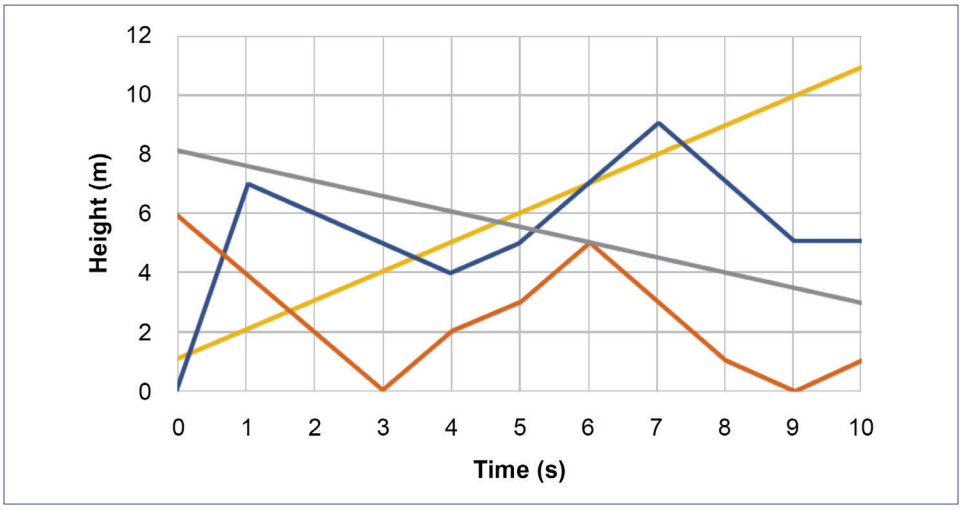
Sci-fi: 4 students

Historical: 1 student

- If available, use the original data (for example, in MS Excel) as a reference point. If the original data are not available, decide whether to provide specific or approximate numbers, depending on the reading level and context.
- Provide the data as a bullet list or an accessible table (Figure 10.17) unless the graphic is a simple bar chart, in which case the data can be provided as a simple list (without bullets or numbers).
- List the elements in pie charts (Figure 10.18) from the largest to smallest percentage.

Figure 10.17: **Description of a graph**

Caption: **Bird flights, measured from ground level.**



Alt text: **A graph shows the vertical movement of 4 birds over a 10-second span.**

Long description: **The x-axis shows the time, from 0 to 10 seconds. The y-axis shows the height, from 0 to 12 metres. The data are summarised in the following table:**

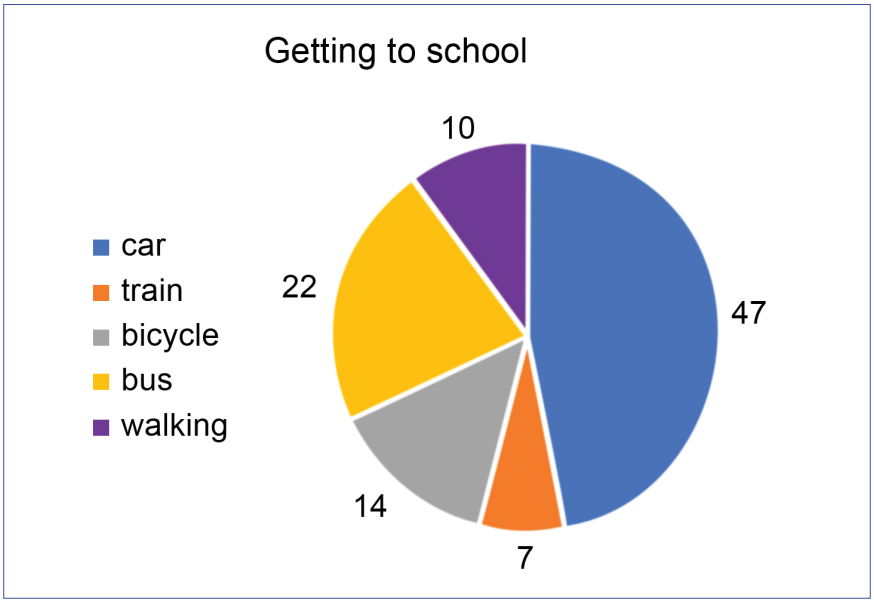
Time (in seconds)	Bird A height (in metres)	Bird B height (in metres)	Bird C height (in metres)	Bird D height (in metres)
0	0	6	8	1
1	7	4	7.5	2
2	6	2	7	3
3	5	0	6.5	4
4	4	2	6	5
5	5	3	5.5	6
6	7	5	5	7

Figure 10.17 continued

Time (in seconds)	Bird A height (in metres)	Bird B height (in metres)	Bird C height (in metres)	Bird D height (in metres)
7	9	3	4.5	8
8	7	1	4	9
9	5	0	3.5	10
10	5	1	3	11

Figure 10.18: Description of a pie chart

Caption: How employees of BookPages Pty Ltd travel to work.



Alt text: A pie chart showing the percentage of employees using one of 5 modes of transport.

Long description: The data are summarised in the following table:

Mode of transport	Percentage of employees
Car	47
Bus	22
Bicycle	14
Walking	10
Train	7

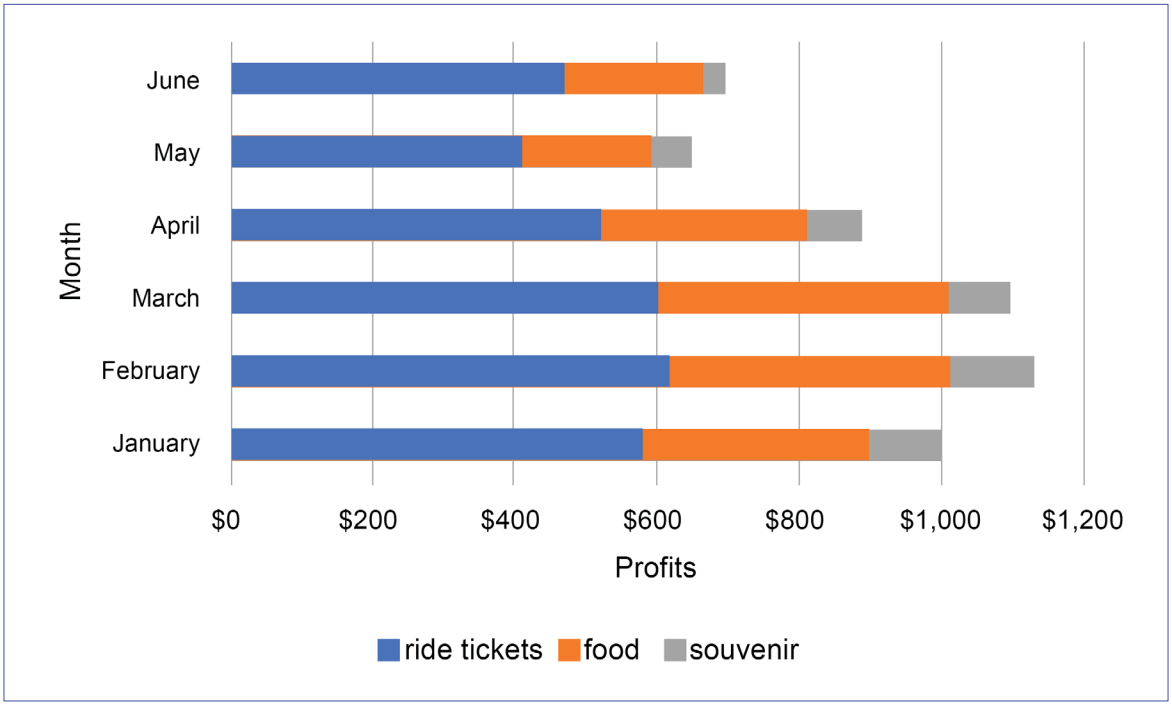
Maths graphs and diagrams

Where possible, convert graphs into accessible tables or bulleted lists. If this is not possible, create alt text using the following guidelines:

- Use short sentences.
- Provide an overall description, including the type of graph or diagram (such as "a bar graph" or "a pie chart"), before describing the details or data.
- Focus on the data rather than the appearance of the graphic.
- For graphs (Figure 10.19), describe the axes and key coordinates or elements, and provide the data in a bullet list.
- For diagrams (Figure 10.20), provide the information in a bullet list.
- For scatter plots, focus on the main trend of the data if the location of specific data is not required, as this would be evident to a sighted user. If more detailed information is required, include the data as a table.
- Spell out units in full (for example, kilometres rather than km), to aid comprehension and avoid any potential confusion.
- Order the information logically (for example, for pie charts, list the numbers from largest to smallest).
- If the image is for an educational text, ensure the terminology used is appropriate to the learning level, matches the vocabulary in the surrounding text and does not introduce terms or concepts that students haven't learnt yet (such as describing the axes as "vertical" or "horizontal" for younger students). It is also useful if the author states their preferences for the description of symbols (for example, whether they wish students to hear "negative 1" or "minus 1", "squared" or "superscript 2").

Figure 10.19: Description of a horizontal bar chart

Caption: Funfair profits.



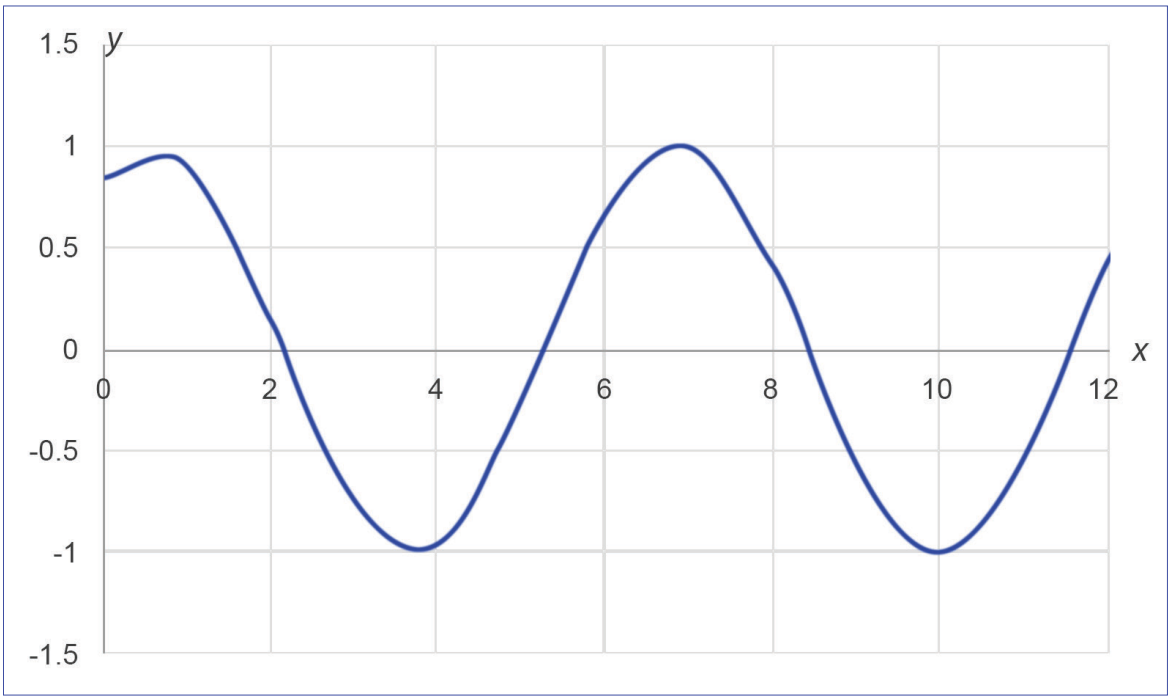
Alt text: A stacked bar graph shows the profits for a funfair broken up by month (January to June) and by type (ride tickets, food, and souvenirs). Each month, most of the profits come from ride tickets, with only a small amount coming from souvenirs. February is the most profitable month; May is the least profitable.

Long description: The y-axis of the bar chart shows the month and the x-axis shows the profits. The following values are all approximate.

- In January, the funfair earned $550 from ride tickets, $300 from food and $100 from souvenirs.
- In February, the funfair earned $600 from ride tickets, $400 from food and $120 from souvenirs.
- In March, the funfair earned $580 from ride tickets, $400 from food and $100 from souvenirs.
- In April, the funfair earned $500 from ride tickets, $300 from food and $100 from souvenirs.
- In May, the funfair earned $400 from ride tickets, $180 from food and $80 from souvenirs.
- In June, the funfair earned $450 from ride tickets, $180 from food and $50 from souvenirs.

Figure 10.20: Description of a maths diagram

Caption: $y = \sin(x + 1)$



Alt text: A graph of a sine wave shows an amplitude of 2 and a period of 2π.

Long description: A graph showing a mathematical function. Values on the x-axis range from 0 to 12. Values on the y-axis range from −1.5 to 1.5.

- A y-intercept is at 0.84.
- x-intercepts are at 2.14, 5.28, 8.42, and 11.57.
- Local maximums are at approximately x = 1 and x = 7. The maximum values are at approximately y = 1.
- Local minimums are at approximately x = 4 and x = 10. The minimum values are at approximately y = −1.

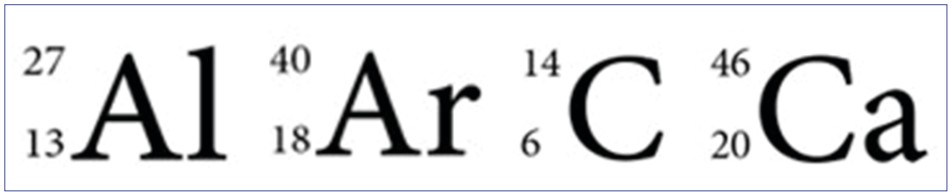
Chemistry elements

Screen readers may be confused by the symbols used for chemical elements. For instance, the symbol for helium, "He", and the symbol for arsenic, "As", will often be read as the words "he" and "as" rather than the individual letters.

When creating alt text that includes element symbols, use capital letters and put a space or commas in between each letter (H E or H,E), to ensure the screen reader pronounces it properly. If you are listing more than one element, use a bullet list format (Figure 10.21).

Figure 10.21: **A list of elements for a question in a chemistry textbook**

Caption: **Find the number of neutrons in each element listed.**



Alt text: **Four elements, with mass numbers and atomic numbers shown.**

- **Chemical symbol A L: mass number 27, atomic number 13.**
- **Chemical symbol A R: mass number 40, atomic number 18.**
- **Chemical symbol C: mass number 14, atomic number 6.**
- **Chemical symbol C A: mass number 46, atomic number 20.**

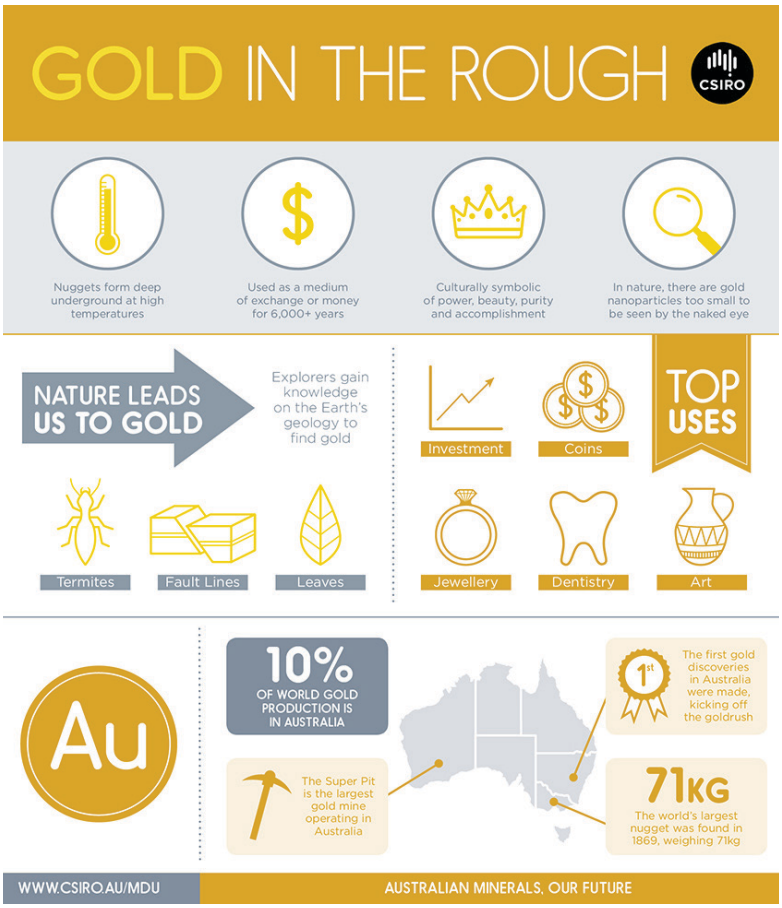
Science diagrams

General principles for describing science diagrams include:

- Provide an overall description, including the type of diagram (unless it is a photograph or this information is already given in the caption), before going into the details.
- Indicate the reading direction of any text in the image if appropriate.
- Write out the labels in the image verbatim and in a logical order (Figure 10.22).
- Focus on the data and other key information, rather than decorative details such as pictograms or colours, unless these are important.
- If the focus of an illustration is to compare items, describe the same features for each item.

Figure 10.22: Description of an infographic

Caption: Gold in the rough.



Source: CSIRO, Creative Commons Attribution 3.0 Unported license.

Alt text: An infographic on the source of gold, from left to right, top to bottom.

Long description:

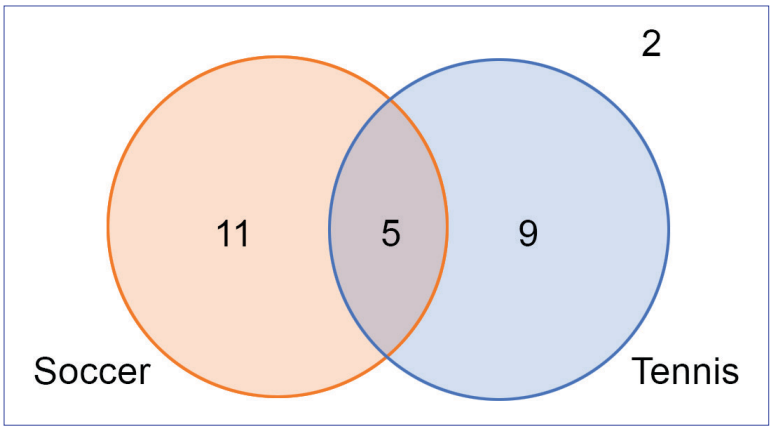
- Nuggets form deep underground at high temperatures. Used as a medium of exchange or money for 6,000+ years. Culturally symbolic of power, beauty, purity and accomplishment. In nature, there are gold nanoparticles too small to be seen by the naked eye.
- Nature leads us to gold. Explorers gain knowledge on the Earth's geology to find gold: termites, fault lines and leaves. Top uses: investment, coins, jewellery, dentistry and art.
- A U. 10% of world gold production is in Australia. Map of Australia with pointers to Western Australia, New South Wales and Victoria. Western Australia: The Super Pit is the largest gold mine operating in Australia. New South Wales: The first gold discoveries in Australia were made, kicking off the gold rush. Victoria: The world's largest nugget was found in 1869, weighing 71 kilograms.
- WWW.CSIRO.AU/MDU. Australian minerals. Our future.

- Use a bullet list in the long description to organise information for an image that requires a detailed description.
- Describe diagrams that organise information in categories, using an overall description in the alt text followed by a table for the data in the long description.
- Write out units of measurement in full (for example, 10 grams, not 10 g), to aid comprehension and avoid any potential confusion.

For further information, refer to the chapter Considerations for mathematics and science texts.

When deciding what information to include in the image description, always consider the author's intent. The examples in Figure 10.23 describe the same Venn diagram, but one focuses on the general appearance of the diagram, whereas the other focuses on the information being presented.

Figure 10.23: Two alternatives for describing a Venn diagram



(a) Focusing on the appearance of the diagram

Body text: What kind of diagram is this?

Alt text: Two overlapping circles, with numbers in each separate section, including a number outside both circles. One circle is labelled "Soccer", the other "Tennis".

(b) Focusing on the data in the diagram

Body text: How many students play soccer but not tennis?

Alt text: A Venn diagram, with circles for soccer and tennis.

Long description: The results are:

Within soccer: 11

Within tennis: 9

Within the overlapping region: 5

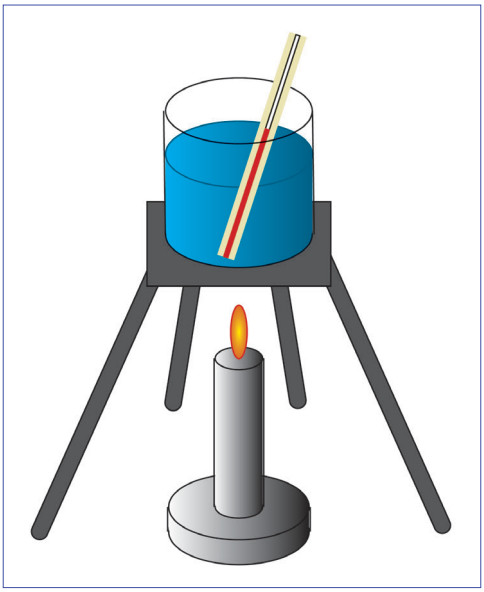
Outside both circles: 2

Scientific illustrations

Focus on the intent of the image in image descriptions for scientific illustrations too.

- Be brief and specific (Figure 10.24).
- Organise information in a linear fashion, from left to right and/or top to bottom.
- Use brief sentences to aid comprehension.
- Break information into chunks, using line breaks, bullet points or lists where necessary.
- Do not repeat information that is already present in the caption or text.

Figure 10.24: **Description of the set-up for a science experiment**



Alt text: **A beaker containing liquid, and a thermometer standing within the liquid. The beaker is on a stand, over a lit Bunsen burner.**

Emoticons

Emoticons (emojis) are images that convey meaning. If they are not described, part of the text's meaning will be missing.

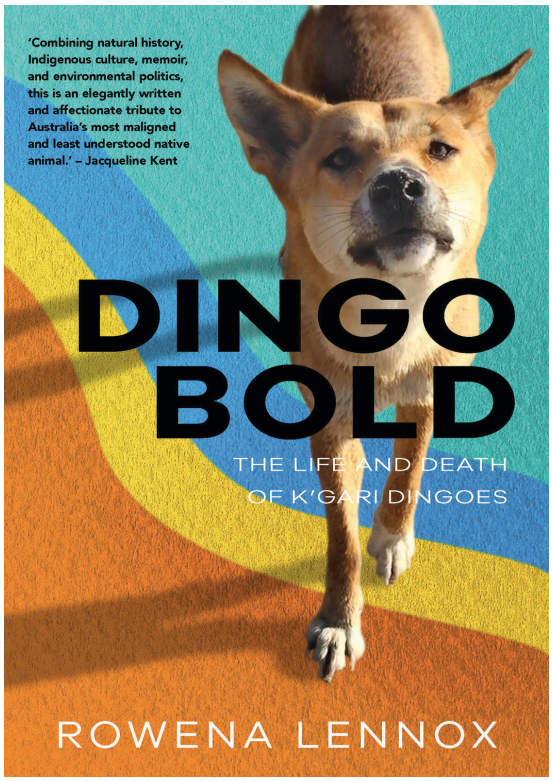
Emojis require alt text each time they are used (for example, "Beaming face with smiling eyes", "Crossed fingers", "Sparkling heart"). A full list of descriptions is available at Emojipedia.

Book covers

The images on the cover of a book are designed to make the book appealing to potential buyers. The image description should have the same aim, so that people using assistive technologies can share the experience and take part in any discussions about the cover:

- Describe the cover images concisely, using the same principles as for images in the body of the book. However, image descriptions for the front and back covers of children's picture books may need to be longer than for other types of publications, due to the key role played by the illustrations in picture books.
- It is not necessary to transcribe the title and author. However, do include any other text in the image, such as quotes (Figure 10.25).
- Describe the typeface only if it provides visual impact and adds to the theme or adds meaning (such as a Gothic typeface dripping with blood for a horror novel).

Figure 10.25: **Description of a book cover**



Source: Rowena Lennox (2021), *Dingo bold: The life and death of K'gari dingoes*, Sydney University Press.

Alt text: A dingo stands on a pattern of curved orange, yellow, blue and green stripes.

Long description: The dingo faces the viewer and holds eye contact. Its right front leg is forwards and straight, while its left front leg is further back with the heel lifted. The dingo's head is lifted with the muzzle and nose raised, and its ears are up and pointing slightly forwards. The book title is in large, bold capital letters. A quote from Jaqueline Kent reads: "Combining natural history, Indigenous culture, memoir, and environmental politics, this is an elegantly written and affectionate tribute to Australia's most maligned and least understood native animal."

- It is acceptable but not strictly necessary to preface the description with "Cover", as this property should be identified in the EPUB file as a semantic tag. However, do include "Cover" in the description of images used on websites and in social media.

Logos

Logos are images, so they require alt text too.

- If the organisation's name is not apparent from the text, or the logo appears before it is named in the text, give the organisation's name in full as it would normally appear.
- Name the organisation without any embellishment, such as unusual capitalisation, that may be used in the logo.
- If the organisation's name has already been stated (for example, on a book's imprint page), "logo" may be sufficient in the alt text.
- Do not describe the visual appearance of a logo unless it is being discussed in the text, it has a particular importance to the content or it is culturally significant and therefore part of the visual messaging. For example, the appearance of the Editors New South Wales logo in Figure 10.26 would be described in a book on graphic design but may be irrelevant in other contexts.

Figure 10.26: **Description of a logo with a distinctive graphic**



Source: **Institute of Professional Editors.**

Alt text **(for a book on graphic design): A logo with a graphic of the open pages of a book. The pages are curled to resemble the outline of the Sydney Opera House. Under the graphic is written Editors N S W.**

Tables

Tables should be supplied as text rather than images, so they can be read by screen readers or in braille. If the table is an image for some reason (for example, it is in a historical photograph) and its contents are relevant to understanding the image, the data must be provided as a full transcript in the image description.

However, even when the table is not provided as an image, it should still include alt text to give a brief overview of what the table contains (Figure 10.27). This allows people using assistive technologies to get a quick overview of what the table contains and a snapshot of the results. They can then decide whether they want to listen to all the detail in the table at that moment or not, in the same way that a sighted reader can glance over the table without necessarily reading every cell.

Descriptions can be added to text tables in MS Word by selecting the table, "Table properties" and then "Alt text". However, alt text cannot be added in Adobe InDesign for tables; it must be added separately to the EPUB file that is created from Adobe InDesign. It can also be added in PDFs using Adobe Acrobat Professional (refer to the chapter Digital formats).

If there are any images in the table, don't forget to describe them too.

Figure 10.27: **A sample description for a table**

Caption: **The times of the top 4 runners (in seconds) in the sprint event.**

Runner	Race 1	Race 2	Race 3	Average	Rank
Runner 1	79 s	64 s	71 s	71.333 s	3
Runner 2	73 s	65 s	68 s	68.667 s	1
Runner 3	63 s	67 s	77 s	69.000 s	2
Runner 4	68 s	72 s	81 s	73.667 s	4

Alt text: **A table shows the results of 3 races for 4 runners, their average times and their rank. The average times range from approximately 68.7 to 73.7 seconds. Runner 2 is ranked first and Runner 4 last.**

Resources

Accessible Publishing Learning Network, Best practices for writing image descriptions

Carl and Ruth Shapiro Family National Center for Accessible Media (NCAM), Guidelines for describing STEM images

Cooper Hewitt, Cooper Hewitt guidelines for image description

Diagram Center:

- Accessible image sample book
- Poet Training Tool

Emojipedia (emoticons)

National Network of Equitable Library Service, Canada:

- Children's books
- Comic book/graphic novel description
- Covers

Round Table on Information Access for People with Print Disabilities, Guidelines for producing accessible graphics (2022)

University of Michigan Library, Describing visual resources toolkit: examples

References

BC Libraries Cooperative (n.d.). Alt-text for picture books.

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BC Libraries Cooperative (n.d.). Comics book/graphic novel description.

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Carl and Ruth Shapiro National Center for Accessible Media (2008). Effective practices for description of science content within digital talking books.

The DAISY Consortium (n.d.). Cover.

Diagram Center (n.d.). Accessible image sample book.

Diagram Center (n.d.). Poet Training Tool.

National Center on Accessible Educational Materials (n.d.). Creating accessible STEM materials.

Osolen, R S and Brochu, L (2020). Creating an authentic experience: a study in comic books, accessibility, and the visually impaired reader, *International Journal of Information, Diversity, & Inclusion*, 4(1).

Philbrook, M (2016). Anime aesthetic, *Chronicles*, Nouspace Publications.

Part 4
Producing accessible books

Chapter 11
Design

While it is in digital publishing that publishers can make a real difference, some accessibility requirements can and should be incorporated in standard print books. Inclusive publishing aims to create books that are usable by as many readers as possible without the need for specialised adaptations. These design principles apply to books in both print and digital formats. For example, a small font in any book – whether a printed book, a fixed-layout EPUB or a PDF – will be problematic for readers who need to magnify it to read.

These design principles ideally should be part of the design brief, but they also need to be assessed in proofreading.

The key principles of inclusive design include:

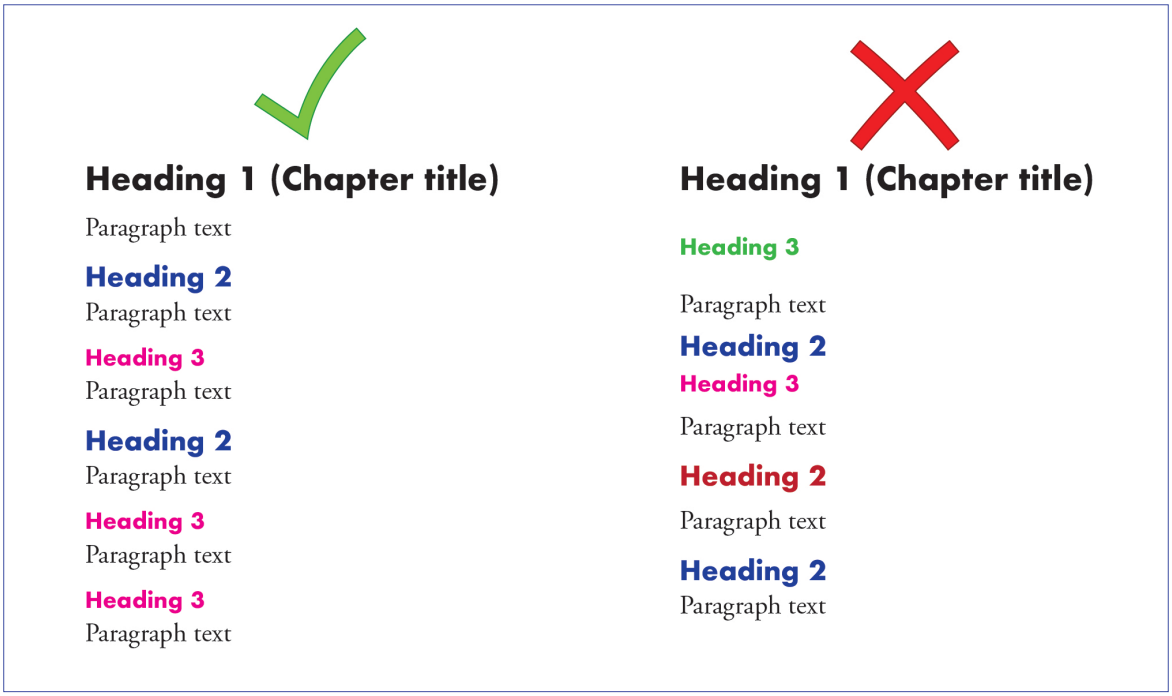
- hierarchy within a logical reading order
- consistency
- proximity
- legibility and readability
- colour contrast and colour-blindness friendly palettes
- the appropriate use of images and graphic elements.

Hierarchy

Hierarchy indicates the order of importance of elements in the text and allows for clear and efficient navigation of the content. In visual design, hierarchy is conveyed through variations in weight, colour, spacing, size, placement and other signals. These are selected using Styles (refer to the chapter Writing and editing). Visual hierarchy is particularly important in complex publications such as textbooks, where an explicit logical order benefits everyone. Numbered headings in educational and other complex texts can also be helpful (for example, the headings in Chapter 1 would be numbered 1.1, followed by 1.1.1 for the next level of heading).

Headings should not be "stacked" together; that is, having no text between consecutive headings. As discussed in the Writing and editing chapter, stacked

Figure 11.1: Comparison of the order and consistency of heading hierarchy in 2 documents



headings can be confusing for some readers. They may also be a sign of poor content structure.

In Figure 11.1, the example on the left demonstrates a logical and clear content visual hierarchy. It has consistent heading formatting and font colour, and paragraph text follows each heading. However, the example on the right has stacked headings: there is no paragraph text following some of the headings. It also has an inconsistent hierarchy (heading 1 is followed by a heading 3), which may cause confusion for readers using assistive technologies who may wonder what happened to heading 2. The colours are used inconsistently and the difference in font size between headings 2 and 3 is insufficient. The spacing between the headings, and between the heading and paragraph text, is inconsistent and illogical too.

Consistency

Ensure the layout is predictable and the established hierarchy is rendered consistently. This involves providing consistent headings and placing elements such as captions and page numbers in the same place on each page, so information can be located easily.

Proximity

Structure similar information together. This helps organise the story and focus readers' attention. It also indicates how the visual elements relate to each other: close proximity suggests a relationship between information elements such as subheadings and the associated text. In the case of textbooks, the learner's attention can also be guided by lists of the main steps and an emphasis on keywords.

Legibility and readability

The text, especially the body text, must be legible and readable. This makes a huge difference to readers' experience. In the context of typography, legibility is related to the design of the typeface and the shape of the glyphs, and how easily one character can be distinguished from another. Readability is about the overall reading experience, which is influenced by how the text is arranged or typeset on a page. Typeface legibility impacts text readability. Apart from the choice of typeface, elements such as structure, font sizes, line length and height, the use of whitespace and contrast all influence readability.

Typefaces

The longstanding sans serif versus serif debate is redundant, since this doesn't really impact reading comprehension. Both sans serif and serif typefaces exist on a continuum from less accessible to more accessible. For example, the taller the x-height, the more legible the typeface tends to be. (The term "x-height" refers to the height of the lowercase x in a given typeface at any given size.)

According to Vision Australia, Georgia and Sabon are examples of more accessible serif fonts, while Calibri, Verdana and Tahoma are some of the more accessible sans serif fonts. Atkinson Hyperlegible (Figure 11.2) is a typeface developed to increase legibility and improve comprehension for readers with low vision.

There are also typefaces designed specifically for readers with dyslexia, including Dyslexie, Gill Dyslexic and OpenDyslexic (Figure 11.2). These typefaces feature increased space between letters, additional thickness at the bottom of the letter and slightly changed shapes, such as an elongated stem on some letters. Dyslexia-friendly typefaces can be loaded into ebook files by the publisher as an option for readers.

Figure 11.2: Comparison of the legibility of different typefaces for the same piece of text in 11 point text with 13 point leading (line spacing)

A swirl of wet leaves from the night-hidden trees decorating the little station beat against the closed doors of the carriages. The porter hurried along holding his blear-eyed lantern to the different windows, and calling the name of the township in language peculiar to porters. There was only one ticket to collect.	Minion Pro 11 pt/13 pt with ligatures
A swirl of wet leaves from the night-hidden trees decorating the little station beat against the closed doors of the carriages. The porter hurried along holding his blear-eyed lantern to the different windows, and calling the name of the township in language peculiar to porters. There was only one ticket to collect.	Minion Pro 11 pt/13 pt without ligatures
A swirl of wet leaves from the night-hidden trees decorating the little station beat against the closed doors of the carriages. The porter hurried along holding his blear-eyed lantern to the different windows, and calling the name of the township in language peculiar to porters. There was only one ticket to collect.	Arial 11 pt/13 pt
A swirl of wet leaves from the night-hidden trees decorating the little station beat against the closed doors of the carriages. The porter hurried along holding his blear-eyed lantern to the different windows, and calling the name of the township in language peculiar to porters. There was only one ticket to collect.	Calibri 11 pt/13 pt
A swirl of wet leaves from the night-hidden trees decorating the little station beat against the closed doors of the carriages. The porter hurried along holding his blear-eyed lantern to the different windows, and calling the name of the township in language peculiar to porters. There was only one ticket to collect.	Verdana 11 pt/13 pt
A swirl of wet leaves from the night-hidden trees decorating the little station beat against the closed doors of the carriages. The porter hurried along holding his blear-eyed lantern to the different windows, and calling the name of the township in language peculiar to porters. There was only one ticket to collect.	OpenDyslexic3 11 pt/13 pt
A swirl of wet leaves from the night-hidden trees decorating the little station beat against the closed doors of the carriages. The porter hurried along holding his blear-eyed lantern to the different windows, and calling the name of the township in language peculiar to porters. There was only one ticket to collect.	Atkinson Hyperlegible 11 pt/13 pt

Source: Text extract from "A dreamer" by Barbara Baynton.

However, while they may be useful for some readers, the jury is still out on whether any of these typefaces make a significant difference for people with dyslexia. A 2016 study of the effect of typeface on screen reading comprehension showed no improvement in reading rate or accuracy when compared to other more accessible typefaces. Overall, readers both with and without dyslexia found that sans serif typefaces (such as Calibri, Verdana, Helvetica and Arial), monospacing and roman fonts made reading significantly easier for digital text than serif typefaces and proportionally spaced and italic fonts.

We are not suggesting that you should limit yourself to the typefaces listed above. It is, however, important to consider the accessibility of typefaces, especially for the body text. Some serifed faces are fine for print even if they are avoided for digital.

Overall, typefaces to be avoided for all formats include those with:

- extremely light and heavy weights
- a complicated or decorative appearance
- extreme stroke contrast (the ratio of thick to thin strokes)
- smaller counters (enclosed or semi-enclosed negative shapes)
- less open (or smaller) apertures (the openings within a letter, such as the curve of the letter "c" or a lowercase "a")
- "imposter" letters and "mirroring" letters. Imposter letters occur in some typefaces where "i", lower-case "l" and the number "1" can be easily mistaken for one another. Pairs of characters such as a lower-case "d" and "b" or "q" and "p" in some typefaces are exact mirror images of one another and can be easily confused.

As the examples in Figure 11.3 demonstrate, all of these typefaces tend to be more difficult to read.

It is also important to use OpenType typefaces that use Unicode character encoding and contain full Unicode character sets. Using the correct Unicode character, based on what it represents rather than how it looks, ensures that symbols are interpreted correctly by screen readers. For example, there are several different Unicode characters for a symbol that looks like a single quote mark (Figure 11.4). However, only one of them is a true single quote mark. The others could represent characters such as accent marks or diacritical marks.

Figure 11.3: Comparison of the readability of different typefaces

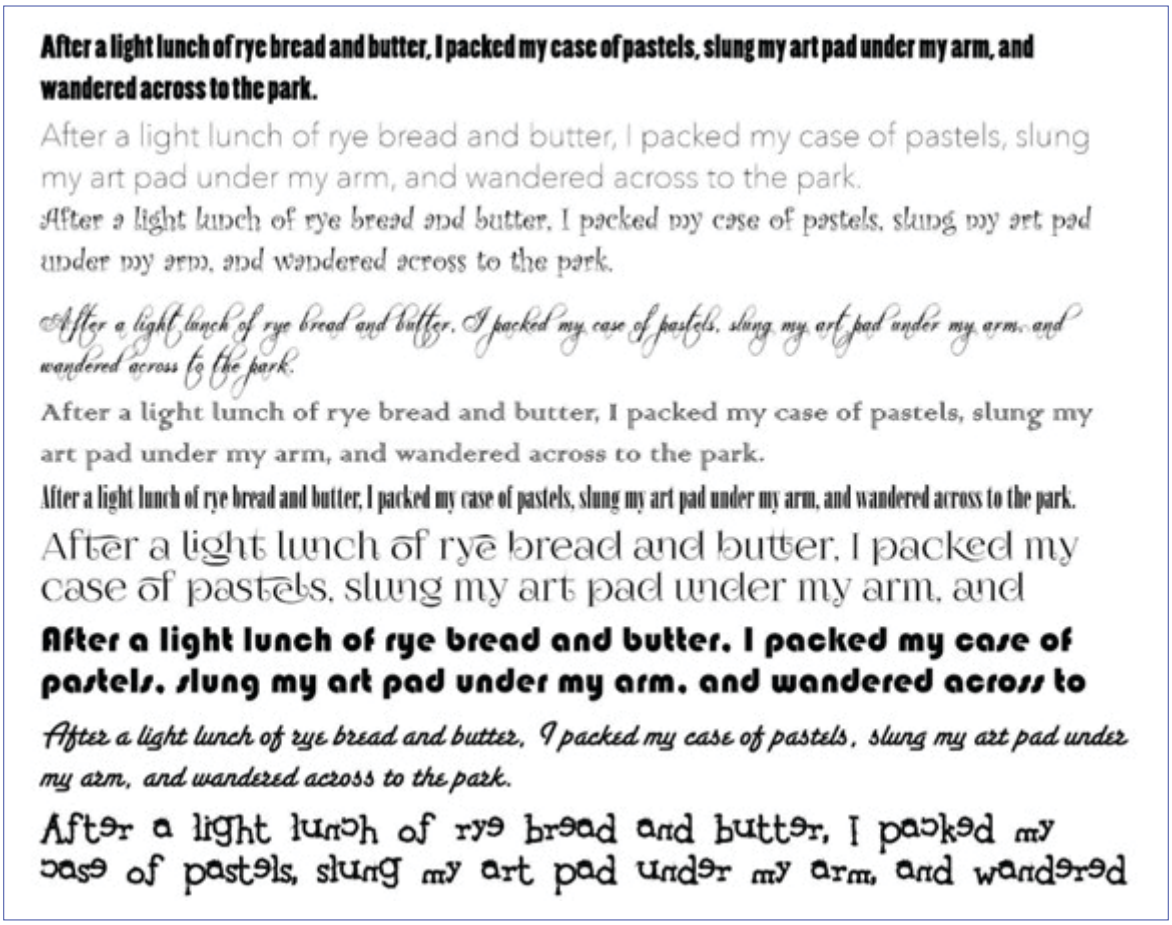


Figure 11.4: Characters resembling quote marks and their Unicode characters

Apostrophe' (use keyboard key or U 0027)
"Straight quote marks" (insert Unicode symbol U 0022)
"Curly quote marks" (use keyboard key or U 201C/201D)
'Single curly quote marks' (use keyboard key or U 2018/2019)
Straight primes ' and " (insert Unicode symbol U 2032 and U 2033)
Accent acute ´ (insert Unicode symbol U 00B4)
Accent double acute˝ (insert Unicode symbol U 02DD)

Type size

The smaller the type size, the more challenging it can be to read. While the optimal point size for print is 10 to 12 point, legibility at this size can vary greatly between different typefaces.

You can check the readability of the text by creating a PDF proof and reviewing it both as a printout, and on computers and other devices with screens of different sizes. (This is relevant for those publishers that need to produce PDFs as a final output.) Consider your audience when selecting the type size and, where possible, test the design with readers with diverse disabilities and demographics.

Style and layout

Other than the type size, suggestions to improve legibility include:

- Avoid ligatures (when 2 letters are joined together to form a single glyph). Adobe InDesign allows for ligatures to be switched off. Not only can the ligatures be difficult to read for human readers, but they are also problematic for screen reader software if your content is digital, as it may misinterpret a ligature as an unfamiliar symbol.
- Avoid using capital letters for lengthy text. The human eye recognises the shape of words and a word in all capitals is harder to recognise, as it looks rectangular and uniform.
- Avoid italics for lengthy text, headings or emphasis. If emphasis is needed, it is better to use bold formatting (refer to the chapter Writing and editing).
- Use underlining only for hyperlinks in text for digital delivery. Having underlined links in digital formats follows an established convention in web design: it helps with the quick identification of links by differentiating clickable elements by means other than just colour. (Refer to the section Hyperlinks in this chapter for more information.)
- Do not use underlining in print formats, due to its association with hyperlinks. Underlined text affects readability, as it changes the shape of words and interferes with the descenders of letters that drop below the line (such as p, q and j), as well as with punctuation. It also adds unnecessary "visual noise" to both the text and the overall design.
- Make sure that the tracking (space between letters) is not too "tight" (when characters touch one another, making them difficult to distinguish) or too "loose" (when the letters are too far apart from one another,

making the words lose their distinctive shapes). WCAG recommends that letter spacing should be at least 0.12 times the font size and word spacing should be at least 0.16 times the font size.

- Ensure the leading is sufficient. It needs to be larger than the space between words. Otherwise, the eye will jump straight to the line below rather than following the same line. This is relevant to both print and digital. WCAG recommends that line height (line spacing) should be at least 1.5 times the font size; spacing following paragraphs should be at least 2 times the font size.
- For optimum readability, try to keep the "average" line length to between 45 and 80 characters. Shorter lines interrupt readability and wider lines can be difficult for the eye to track. Any more starts to tire the eye, especially in long pieces of text. The more words per line, the more space is needed between the lines.
- Left-align text, as this is easier to read. However, some content may need specific alignment to make sense (for example, accounting).
- Keep hyphenation to a minimum or turn it off.

Heading design

As mentioned in the chapter Writing and editing, using headings and sub-headings in text-heavy publications makes it easier for readers to navigate the text and to understand ideas and concepts. It also helps reduce reading fatigue.

Use sentence case instead of title case in formatting. Title case – moving from upper case to lower case – is inconsistent and therefore harder to read. Distinguish headings and subheadings from the body text by using a bold font and different colours. The legibility recommendation associated with typefaces used in the body text can be stretched in the case of headings, but typefaces and formatting should ideally still be as legible as possible.

Tables of contents

The American Printing House for the Blind discourages the use of lead lines (dotted lines in a table of contents to link the title to the page number), as they can be confusing to readers with low vision. Instead, add a pastel background colour or a light shade of grey behind every other line. The colour contrast between text and shaded background must be sufficient for WCAG AAA accessibility (Figure 11.5).

Figure 11.5: A table of contents that uses pastel line highlights to improve readability

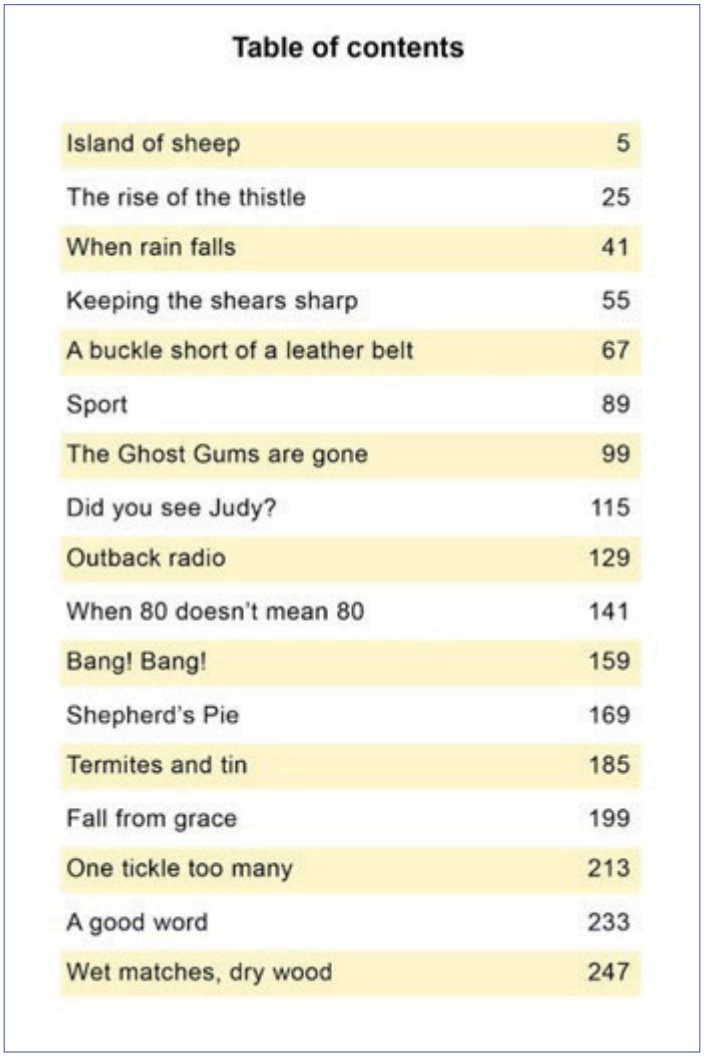


Table of contents

Island of sheep	5
The rise of the thistle	25
When rain falls	41
Keeping the shears sharp	55
A buckle short of a leather belt	67
Sport	89
The Ghost Gums are gone	99
Did you see Judy?	115
Outback radio	129
When 80 doesn't mean 80	141
Bang! Bang!	159
Shepherd's Pie	169
Termites and tin	185
Fall from grace	199
One tickle too many	213
A good word	233
Wet matches, dry wood	247

The use of colour

In general, the design should not only use colours with sufficient contrast but also adhere to colour-blindness design criteria.

In the case of online publications, allow readers to customise the images and choose their preferred colours, brightness and contrast where possible. This can greatly improve the reading experience for readers with dyslexia, for example.

Typography and colour

Colour contrast should be sufficient to meet WCAG Level AAA conformance where it is used in headings and other structural and navigation elements. Smaller fonts require greater colour contrast to be readable. Avoid combining yellow with blue, green with red, or green with yellow, as these colour

combinations are particularly difficult for people with colour vision limitations to distinguish (refer to the section Colour blindness in the chapter, "Know your audience").

Ensure there is enough colour contrast between the type and its background. Avoid using colour shading and screens that reduce the contrast between text and background. The easiest to read combination is dark text on a light background. Although reversed text (light text on a dark background) can have sufficient colour contrast to meet accessibility criteria, it can be fatiguing for the eye, so use it sparingly.

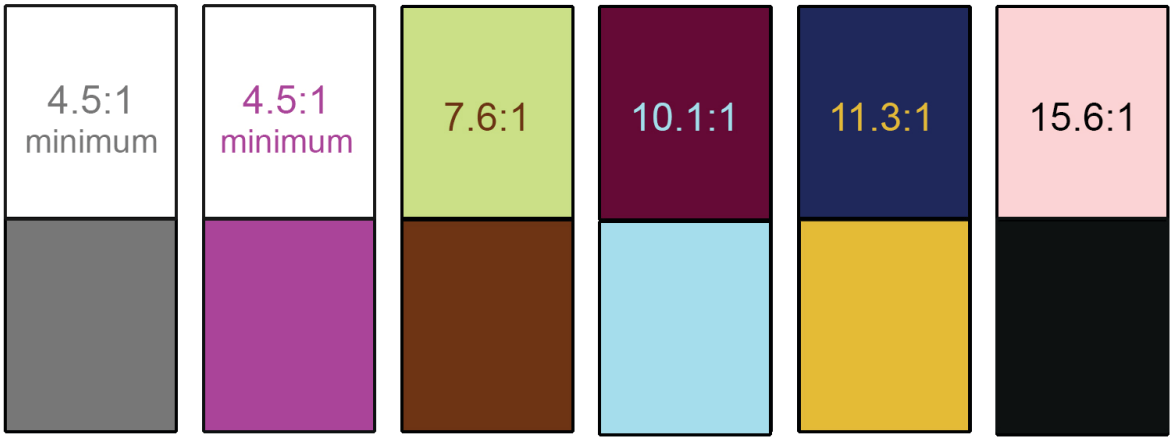
Reserve the use of type in light colours on dark backgrounds for short texts and ensure the type is in bold and large enough to ensure readability. Use dark text on a light background for the best results (Figure 11.6).

The contrast between the text and background should be equal to or greater than 4.5 : 1 for small text and 3 : 1 for large text (large text is defined as 18 point or 14 point bold and larger). These requirements apply to text and graphics that are essential for understanding the content. Some readers find certain 4.5 : 1 ratio colour pairings difficult to read, which is why the ratio recommendations are "equal to or greater than". The pairings in Figure 11.7 all have acceptable colour contrast.

Figure 11.6: **Comparison of text with different levels of contrast**



Figure 11.7: Comparison of colour contrast ratios



Illustrations and colour

In highly illustrated books such as textbooks:

- Use colour consistently to help with navigation.
- Combine colour with other design elements in charts and graphs (such as shape, size and pattern variation for optimum accessibility) rather than using colour coding as the sole means of conveying information. If in doubt, convert the chart or graph into greyscale and check if you can still distinguish the details.
- Display charts and graphs and other infographics in monochrome texts as simple, black-and-white line drawings rather than greyscale images. Use shapes rather than shades of grey (Figure 11.8). Mixed patterns (such as diagonal lines or polka dots) can work well. However, use these judiciously, as too many patterns can make a graphic just as difficult to read as colours with low contrast.

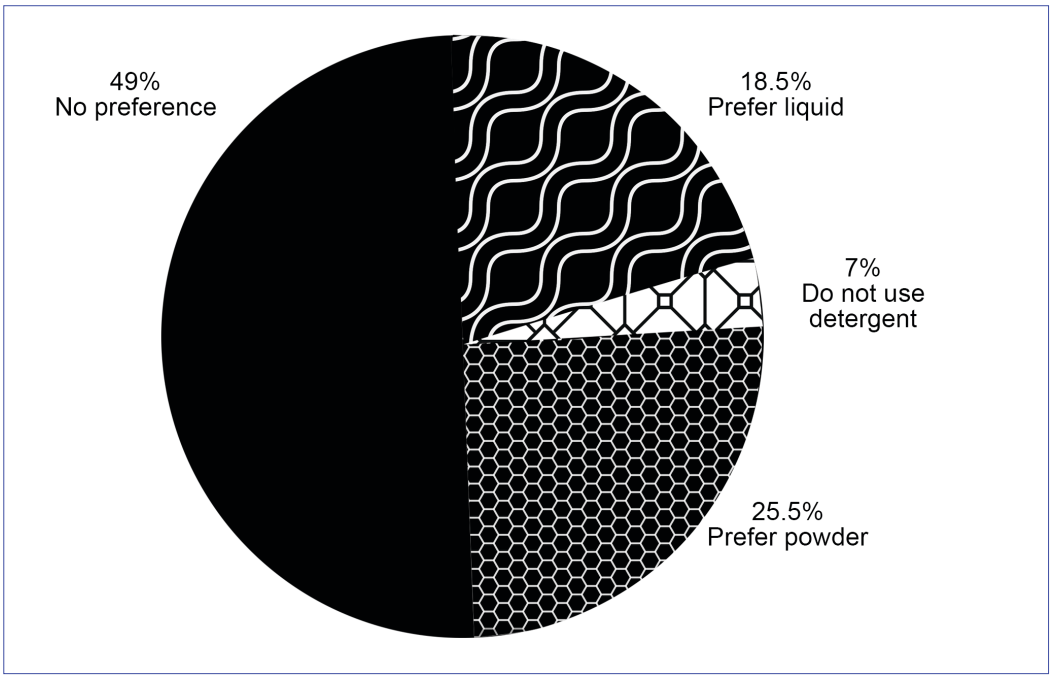
There is no need to meet colour contrast requirements for logos or incidental graphic elements.

Maps, charts and graphics can be designed with greater clarity by:

- choosing unambiguous colour combinations; that is, colours with strong contrast
- using additional visual variables such as such as shape, size, and pattern variations provided they can be easily described

Figure 11.8: The use of shape to distinguish elements in a pie chart

Caption: Students' preferences for laundry detergents when using their local laundromat



- annotating features directly; that is, providing additional information (such as labels and keys) that explains, elaborates on or emphasises the visual elements.

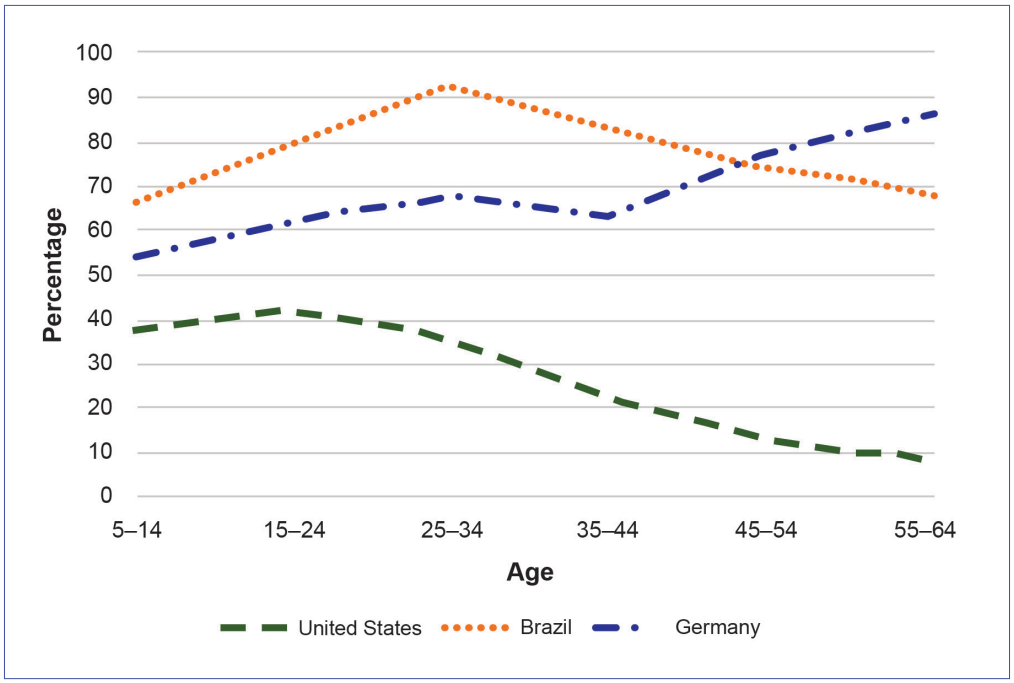
The following examples illustrate design alternatives for different graphs. In Figure 11.9, the graph lines are distinguished using different line styles. This can work well if there are only a few lines, as in Figure 11.9a. However, if there are more than 3 lines, as in Figure 11.9b, patterns are likely to be repeated or look very similar and it becomes increasingly difficult to determine which line is which.

In Figure 11.10, the lines are distinguished using labels directly attached to the graph line. This ensures the reader does not need to see colour or line texture. Labels can work well when there is sufficient space to make them large enough to be readable.

In Figure 11.11, the lines are very close together (especially the bottom 3 lines). Because of this, it is appropriate to use only letter labels ("A", "B" and so on) for each line, with a legend giving further information. This option can also work well where there is limited space available and written labels would be too small to read, such as on a two-column printed page.

Figure 11.9: Two design alternatives for a graph charting soccer fans by age and country

(a) A graph with 3 lines and clearly distinguished patterns.



(b) A graph with 5 lines, using similar and repeated patterns.

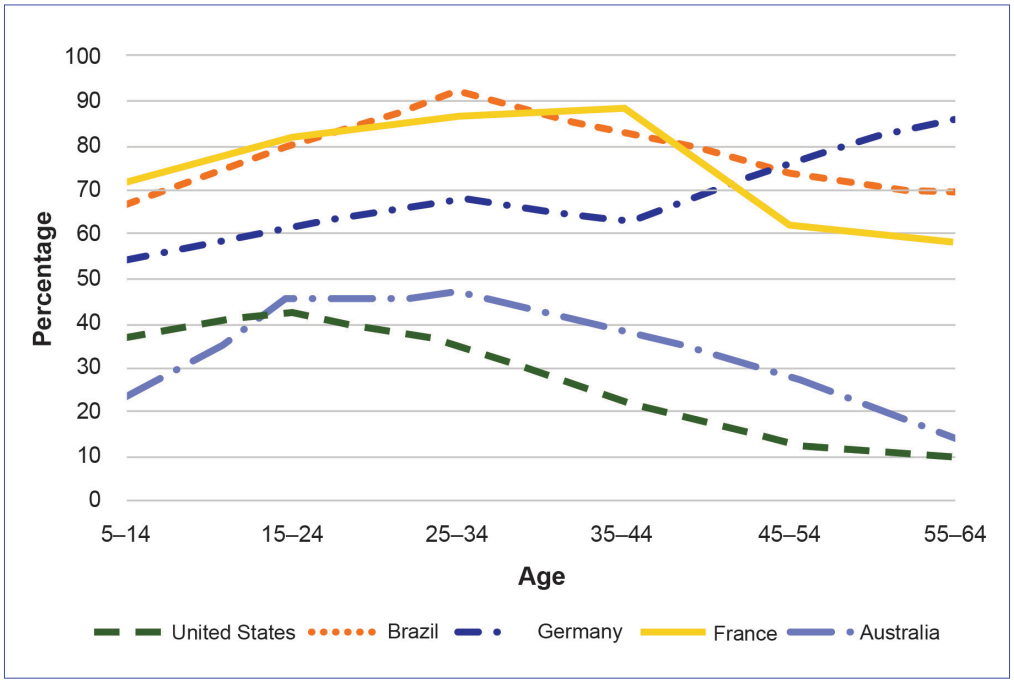


Figure 11.10: A graph charting book sales by month (January to June) for 5 different books

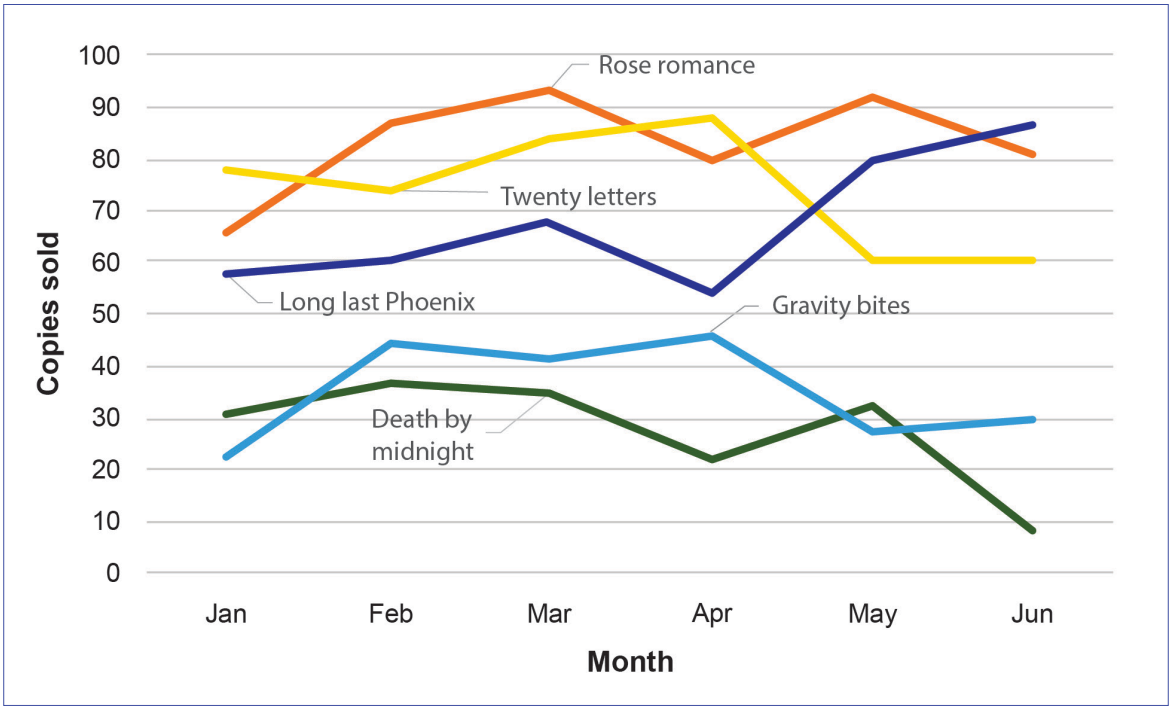
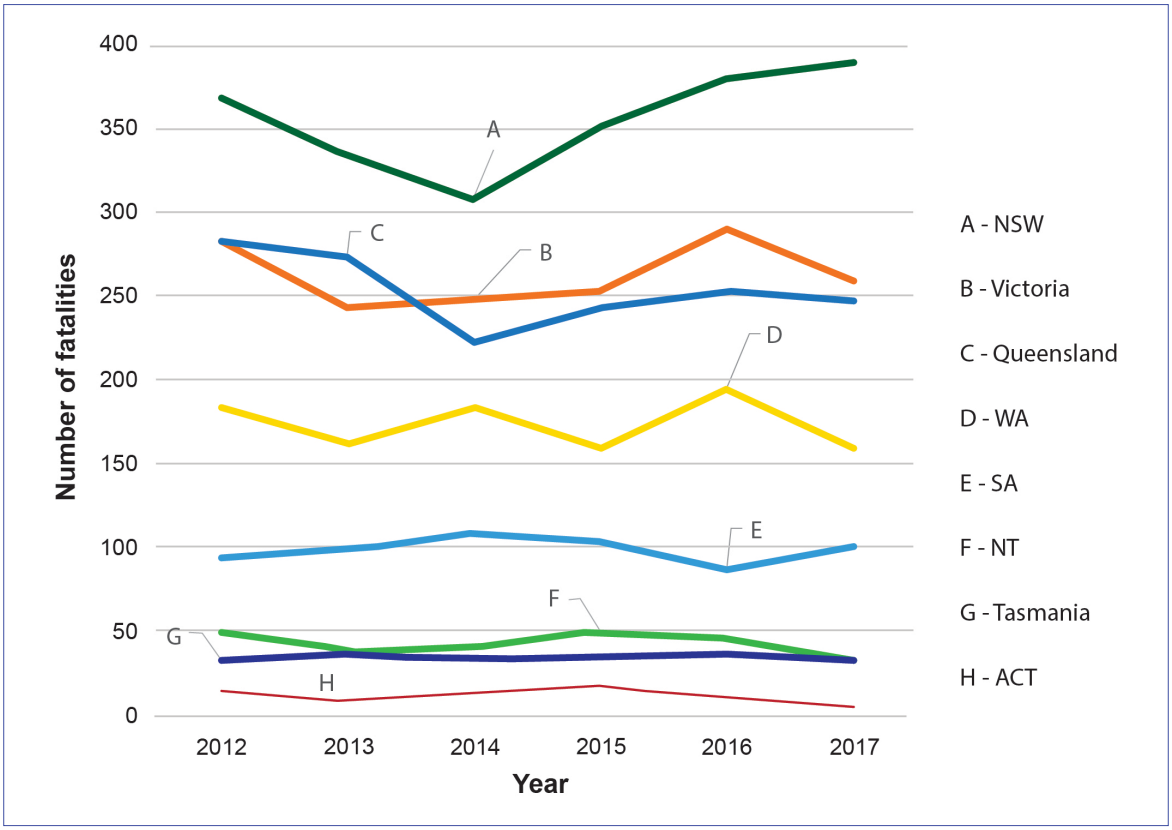


Figure 11.11: A graph charting traffic fatalities for Australian states and territories (2012 to 2017)



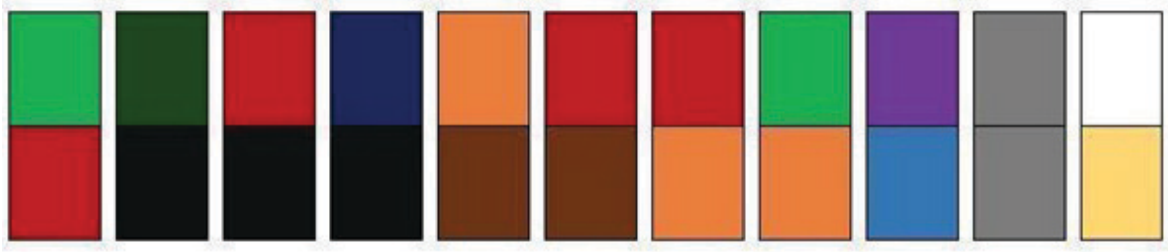
Colour contrast checkers

Numerous online colour contrast checkers are available to ensure that the colour combinations you use are accessible. Others allow users to measure the contrast between text and background colours (refer to the list of Resources at the end of this chapter). Depending on the checker you use, you may need to convert the colour code into other codes (such as HEX, CMYK and RGB) in order to add the correct colour to your document.

The online colour contrast checkers follow WCAG recommendations, which have been designed specifically for digital formats. Print and digital colours have slightly different properties that can affect readability. The American Printing House for the Blind therefore recommends **not** using the following pairs of colours next to each other (Figure 11.12):

- green and red
- dark green and black
- red and black
- navy and black
- orange and brown
- green and brown
- red and brown
- red and orange
- green and orange
- purple and blue
- grey and grey
- white and yellow
- any colour and grey.

Figure 11.12: **Colour combinations for print that the American Printing House for the Blind recommends avoiding**



Appropriate use of images

Images should be meaningful and clear. Avoid:

- too many visual elements; these can make a layout look and feel busy, and impact legibility. It may be better to remove unnecessary elements, or group smaller elements together.
- extraneous or distracting images in educational texts; these can interfere with learning. As a general rule, visuals in educational materials should be complementary to the learning process and support the learning goals.
- placing text over "busy" images or patterned backgrounds (Figure 11.13).
- watermarks or complicated background designs, to reduce distractions.

Figure 11.13: **Comparison of images containing text**

(a) **The text title is hard to see when it is placed in front of the photograph.**



(b) **The text title is easier to read when placed in front of a simple high contrast background.**

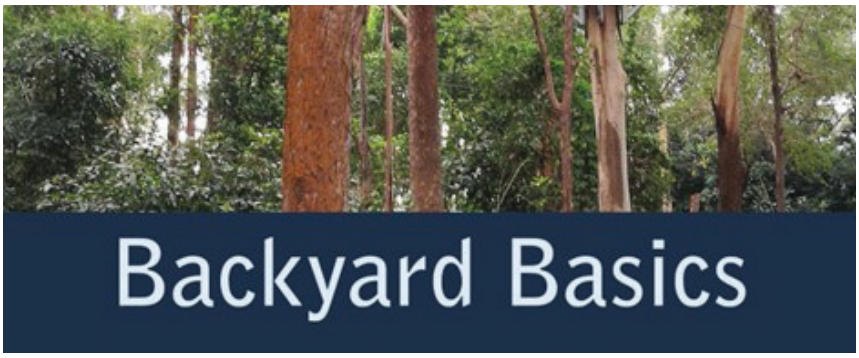


Table design

In MS Word, tables should always be formatted using the Table function; style the table headers and cells using Table Properties. In Adobe InDesign, format tables using the Create Table option; style the headers and cells using Table Options and Styles.

Tables should have:

- clearly defined headers
- borders
- good colour contrast
- adequate space between text and border so that the cell contents do not merge visually with the borders of the table.

Avoid leaving cells empty. If empty cells are needed for some reason, this should be explained in the caption or body copy (refer to the chapter Creating accessible tables).

Ensure that tables are not overcrowded, to avoid decreasing readability and usability (Figure 11.14). A lack of space makes it difficult for readers to

Figure 11.14: A comparison between designs for a table

(a) A table of data that is overcrowded and difficult to read.

ID	Vendor	Item	SKU	Cost	RRP	Notes
10234	Southpines	Light to Dark Shades	L2DS221655	$5.43	$19.17	Do not accept returns
10235	Southpines	Dark to Light Shades	D2LS221655L	$5.43	$19.17	Do not accept returns
10236	Marbles	Sea Shanty and Shack	SSS2222	$6,000.00	$23,400,000.00	These sales must all go through HQ
10237	Southpines	Tyre Runner and Rear Bar	TRRB2230	$55.00	$1,966.25	Made to order, pls remind customer
10238	Captain Chips	Frenchies Playdough Frier	FPF22987	$12.89	$108.00	Have met Australian Safety standard
10239	Southpines	Frenchies Playdough Master Frier	FPF22987A	$15.89	$164.12	Have met Australian Safety standard
10240	Captain Chips	Curly Deep Fry	CDF22988	$12.39	$99.78	Have met Australian Safety standard
10241	Squall	Cape Cod Fishing Line	CCFL222002	$16.10	$168.49	Only a limited supply left, switch off
10242		Cape Cod Hook Set	CCHS222003	$12.55	$102.38	-
10243	Squall	Cape Cod Reel'm in Set	CCRMIS222004	$550.00	$196,625.00	Must include the Cheroke with this
10244	Southpines	Beach Towel and Bucket	BTB226653	$8.80	50.34	Switch picture monthly on website
10245	Southpines	Beach Towel and Trowel	BTT226654	$8.04	$42.02	Switch picture monthly on website

Figure 11.14 continued

(b) The same table with increased white space and alternating rows of soft colour behind the text, which makes the data much easier to read.

ID	Vendor	Item	SKU	Cost	RRP	Notes
10234	Southpines	Light to Dark Shades	L2DS221655	$5.43	$19.17	Do not accept returns
10235	Southpines	Dark to Light Shades	D2LS221655L	$5.43	$19.17	Do not accept returns
10236	Marbles	Sea Shanty and Shack	SSS2222	$6,000.00	$23,400,000.00	These sales must all go through HQ
10237	Southpines	Tyre Runner and Rear Bar	TRRB2230	$55.00	$1,966.25	Made to order, pls remind customer
10238	Captain Chips	Frenchies Playdough Frier	FPF22987	$12.89	$108.00	Have met Australian Safety standard
10239	Southpines	Frenchies Playdough Master Frier	FPF22987A	$15.89	$164.12	Have met Australian Safety standard
10240	Captain Chips	Curly Deep Fry	CDF22988	$12.39	$99.78	Have met Australian Safety standard
10241	Squall	Cape Cod Fishing Line	CCFL222002	$16.10	$168.49	Only a limited supply left, switch off
10242	Squall	Cape Cod Hook Set	CCHS222003	$12.55	$102.38	-
10243	Squall	Cape Cod Reel'm in Set	CCRMIS222004	$550.00	$196,625.00	Must include the Cheroke with this
10244	Southpines	Beach Towel and Bucket	BTB226653	$8.80	50.34	Switch picture monthly on website
10245	Southpines	Beach Towel and Trowel	BTT226654	$8.04	$42.02	Switch picture monthly on website

differentiate text from borders. The American Printing House for the Blind recommends using pastel background colours on alternating lines to reduce the number of borders and improve legibility in the table. If you are adding shading, maintain sufficient colour contrast between the text and the shading in the background. Another option is to use well-spaced rows with unobtrusive lines.

Correct alignment of values aids visual interpretation:

- text should always be left-aligned, unless it is a column of single words
- numbers should generally be right-aligned or aligned on the decimal place
- try to keep the same number of decimal places in a column (add extra zeros in some numbers if necessary to achieve this).

Captions

Place captions for images and tables in a consistent location across the publication.

While table captions must be placed above the tables (as readers typically read tables from the top down), figure captions have been traditionally placed below the image. However, they should ideally also appear above the image that they refer to. This placement allows the caption to be read first by text-to-speech technologies, before the alternative text description.

Footnotes and endnotes

If you are using footnotes or endnotes:

- Do not make the note reference numbers too small. Superscript numbers are often difficult to see for readers with low vision. While note numbers can be slightly smaller than the body text, they should not be tiny. The font size or reference number in MS Word documents can be modified using the Styles tool.
- Ensure the footnote text is also of a legible size and not too much smaller than the body text.
- Try to keep footnotes on the same page as the reference in the print edition, so they are easy to find.

Hyperlinks

The way that hyperlinks are represented depends on the format of publication.

In print, the URLs need to be visible so that readers can retype them if needed. If the URLs are long and unwieldy, use a URL shortener (a simple online tool such as Bitly) to reduce it. These tools not only allow shortening of long URLs for use in the publication, but they also help keep the URL up to date and monitor its use.

In digital formats, it is best practice to use descriptive hyperlinks (refer to the section Digital hyperlinks in the "Digital formats" chapter). However, this is problematic when the same PDF file is used for both print and digital delivery, as the URLs will not be visible when the document is printed. Descriptive hyperlinks are also problematic for publishers using a format-neutral workflow. A single source file is used for both print and digital formats, but having descriptive hyperlinks would make the file unusable for print.

That said, there is a need to visually represent URLs in a different way in print and digital formats. In some XHTML platforms, the workflow allows for different visual styles to be applied on export from the same source file. URLs are marked as active and underlined in the digital format, while they become inactive, without underlining (and sometimes represented in angled brackets), in the print format.

If the workflow doesn't allow for the application of different style settings to URLs, extra work will be needed to convert the links one way or the other. A decision therefore needs to be made about whether to prioritise the print or digital links. (For example, you could have a hyperlink character style in Adobe InDesign that is adjusted depending on the output format, such as removing underlining for print.)

Paper and binding for printed editions

The following suggestions outline best practice for printing. However, the choice of materials will also be affected by other factors, such as cost, availability and genre.

- Use matt, satin, silk or uncoated papers. These cut down on glare, which can impair vision for all readers.
- Avoid glossy papers, as light will reflect off the surface and obscure the print.

- Use paper with sufficient weight, so the print does not show through on the other side and interfere with legibility.
- Use binding that allows the book to open flat.

Resources

Colour contrast:

- Eight Shapes: Contrast Grid
- Github: Accessible Color Palette Builder
- Rapid Tables: Color code converter
- Snook CA: Colour Contrast Check
- Vision Australia: Colour Contrast Analyser
- WebAIM: Colour Contrast Checker

Print:

- Round Table on Information Access for People with Print Disabilities: Guidelines for producing clear print (2022)

Typefaces:

- Atkinson Hyperlegible
- Dyslexie
- OpenDyslexic

URL shorteners:

- Bitly
- TinyURL

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Chapter 12
Digital formats

Books and other long-form documents in digital formats are inherently more accessible than print. This is because electronic text can be automatically rendered into other modalities thanks to the technical capacity of assistive technologies (screen readers, synthetic speech and so on). The accessibility of different formats varies; it also changes as technologies improve.

To make the most of technology, all digital formats must be produced with accessibility in mind at 2 levels: the content and the container (file format). At minimum:

- Structure the files correctly, using headings.
- Include alternative text (and long text descriptions if required) for all images and tables.
- Add captions and audio descriptions to any multimedia.
- Structure tables correctly, providing clear indications of whether a cell is a heading or body text.
- Consider including cross-references or internal hyperlinks to relevant sections in the book that provide the reader with further information or definitions.
- Structure hyperlinks correctly (refer to the section Digital hyperlinks later in this chapter).
- Include ARIA role attributes in EPUB files (refer to the section ARIA role attributes).
- Include accessibility metadata in EPUB files (refer to the section Ebook metadata).

Books and other long-form documents are typically produced in the following digital formats: MS Word, PDF, reflowable EPUB, fixed-layout EPUB and HTML.

MS Word

MS Word can be one of the most accessible file formats available (provided the basic accessibility requirements are implemented), as it allows users to change features such as the font size and type, margins and spacing. The Microsoft website offers an extensive set of step-by-step instructions and information on best practice. As MS Word is the format used at the beginning of many publishing workflows, ensuring that all MS Word files are fully accessible allows the workflow to begin on the right footing.

PDF

PDF (printed digital format) was originally devised to transform the printing process when computer to plate (CTP) printing was first introduced. As such, it has remained the only way to produce reliable printed content, as layouts are fixed and there is little to no chance of anything changing once the files are sent to the printer. As PDF files are independent of application software, hardware and operating systems, they are also commonly used to distribute content digitally in academic and government publishing.

To be accessible via screen readers, PDF files must be editable. Unfortunately, this is not what PDFs were originally devised for. Moreover, PDF files need structure tags, a labelled reading order, labelled headers, and image descriptions. Even with those features implemented, PDFs remain problematic for people with print disabilities, as users cannot customise the reading experience.

Creating PDFs

A PDF can be created directly from MS Word (with all accessibility features implemented) by saving the file using the option Save As and "Best for electronic distribution and accessibility". You will still need to check the resulting PDF for accessibility.

Do not use the Print to PDF function in MS Word, as it doesn't always preserve the heading structure, alternative text and any other tag structure. Although a screen reader may still be able to access the text of a PDF file created in this manner, it won't be able to interpret the missing structural elements for the human trying to use it.

When using Adobe InDesign to create a PDF:

- Manually add the tags, the order of those tags, image descriptions and basic metadata to the document before exporting it.

- Turn off the shared hyperlink destination checkbox before adding any hyperlinks.
- Export the file as an accessible PDF.

Avoid exporting a PDF file as spreads. In most cases, the font size will be too small for many people to read comfortably on-screen. Those readers who may want to see both pages side-by-side can do so by selecting the "Two-page view" page display setting in Adobe Acrobat Reader.

Remediating PDFs

Remediate PDFs using PDF editing software such as Adobe Pro DC or Kofax Power PDF.

- Implement the reading order. This ensures the information is presented in a logical order when read aloud, so the screen reader doesn't move around the page or read information about graphics mid-paragraph.
- Add any other accessibility features required at this stage, including alt text in tables.

Of course, any changes you make in the PDF will need to be made again if you create a new version of the PDF, for example from MS Word or Adobe InDesign.

It is worth pointing out that PDF and MS Word files cannot be sold on the open ebook marketplace (with the exception of academic libraries). Even though these types of files can be made accessible, you will need to consider other digital formats if you are publishing for commercial distribution.

Reflowable EPUB

Most publishers these days produce EPUB publications, which "can be authored with a high degree of accessibility simply through the proper application of established Web accessibility techniques" (World Wide Web Consortium (W3C), EPUB Accessibility 1.0).

Reflowable EPUB files are inherently more accessible than PDFs, as readers can customise the reading experience by changing the typeface and font size, spacing, margins and background. An EPUB 3 file is a zip package containing HTML and other files. EPUB 3 superseded EPUB 2 in 2011, and it is natively more accessible: it has richer navigation, it is both human- and machine-readable, and it contains support for multimedia and MathML, among other accessibility features.

For an EPUB 3 file to be accessible, the file must:

- include image and table descriptions (alt text).
- properly identify all headings, which should be in a logical, cascading order for efficient navigation.
- use HTML5 tags. EPUB 3 uses HTML5, which supports more semantically meaningful mark-up. Images and captions should be marked with <figure> and <figcaption> tags.
- have a page list (a list of all the pages in the ebook, and how they correspond to the page numbers in the print edition). Include page locators) (refer to the section Page number locators).
- have a full set of landmarks (front matter, body matter, end matter, table of contents, list of illustrations, figures and maps, pagelist, copyright page, contributors, endnotes, index, glossary). This will make the ebook easier to use for all readers.
- use ARIA role attributes and landmarks so that assistive technology users can easily navigate to sections of an ebook (refer to the section ARIA role attributes).
- identify the main language and any language shifts.
- properly identify context breaks (for example, the semantically correct way of marking editorial spaces or context breaks is with a <hr/> tag).
- identify the page title at the top of each file (it should be the chapter title). Meaningful page titles allow users to find and navigate documents without having to read them first.
- include accessibility metadata, as this allows the accessibility of a publication to be documented (refer to the section Ebook metadata).

Some of this information can be added in Adobe InDesign. However, at present an EPUB 3 file exported from Adobe InDesign lacks the following accessibility features:

- accessibility metadata
- pagelists and number locators
- ARIA role attributes and landmarks
- extended image descriptions
- alt text descriptions in tables
- structured code and language tagging.

Moreover, it is difficult to create sections and landmarks, and the file contains some needlessly complex code.

In order to be accessible, the resulting EPUB 3 file must be manipulated in a specialised software such as oXygen, Calibre or Sigil. Another option is to

use Circular Software, which allows publishers to prepare and convert Adobe InDesign files to a reflowable EPUB 3 which conforms to Level AA WCAG success criteria.

Long descriptions for images

If there is no space in the software (such as Adobe InDesign) to include long descriptions for images, provide this information in an appendix in the EPUB file, and link it to the image in its original location. Having the long description as an appendix allows for the inclusion of headings and tables to structure complex content.

Page number locators

The World Wide Web Consortium (W3C) standard EPUB Accessibility 1.1 states that a digital publication should include page navigation where an equivalent printed text will also be published. This is so that users of the digital text can easily locate the relevant material when a page number in the printed text is referred to. This is particularly important in an academic environment that places value on acknowledgement. Ebooks without page numbers do not support the fundamental task of research and learning in university, which may affect purchasing decisions.

Page number locators can therefore be important to users across all formats, including:

- students whose teacher directs the class to turn to a particular page
- book groups discussing select passages in a novel (some may have the print version and others the ebook)
- braille users (braille transcribers include both a braille page number and the equivalent printed page number to help students find material being referred to)
- academic citations (which require page numbers to references in the source material).

The W3C standard EPUB Accessibility 1.1 provides an example of how this should be implemented (Figure 12.1).

The visibility of those page number locators to the user depends on the support in the e-reading software.

Reflowable EPUB files can also be created directly from MS Word, but some cleaning of coding may be needed when saving the MS Word file as an EPUB. Word2EPUB developed by the The DAISY Consortium is a free tool that results in better formatted files (use the link in the Resources list for more information).

Figure 12.1: **A sample of page number locator coding using epub:type element and ARIA role attribute**

```
<span
    id="page001"
    epub:type="pagebreak"
    role="doc-pagebreak"
    aria-label="1"/>
```

Source: **World Wide Web Consortium (W3C), EPUB accessibility techniques: 5.1.1, Provide page break markers.**

Considerations for poetry

Some poets and their publishers have concerns about whether their poems can be rendered adequately in a reflowable ebook. The formatting reflects the rhythm of a poem, so they feel that being able to change the way the poem looks on-screen undermines the integrity of its architecture. They consider their only options to be publishing in print alone or using a fixed format such as PDF or fixed-layout EPUB for the ebook.

However, offering a choice of only print or a fixed layout can render poetry inaccessible to some readers. If the visual layout is not reflowable, people with print disability cannot increase the font or decrease page size according to their needs, making the poem effectively unreadable for some of them. Writer Lisa Rutledge, who has spastic cerebral palsy, observes that poetry's power lies in its use of unique imagery and language to render the personal experience a universal one. She argues that prioritising the appearance of a poem over its accessibility in the ebook format excludes some readers from that experience, which is the opposite of what poetry sets out to achieve.

Many early reflowable ebooks mangled the appearance of a poem, removing line breaks and spacing between stanzas so that content was squeezed together as a single block of text. But as the demand for ebooks increases, publishers are finding ways to adapt poetry for e-readers, including:

- formatting the text in HTML, manually tagging the lines, stanzas and any deliberate indents and providing an additional indent for any lines

that overflow to the next (the DAISY Accessible Knowledge Publishing Database recommends using the <br> tag for line breaks and tags for additional line formatting)
- adding a note at the beginning of a poem or collection explaining that readers can reduce the size of an ebook page or font if they wish to see the poet's intended formatting
- including a description of the layout that conveys its meaning
- using a new page to start each poem in the ebook (this is an advantage of the digital over the print version, as there are no concerns about fitting the poems into a set number of pages).

Publishers and self-publishing authors can also consider using free ebook editing tools such as Calibre (to convert MS Word files to an EPUB format) and Kindle Create (for publishing from the MS Word file on Amazon Kindle), which can preserve the original formatting when uploaded.

Even if the ebook is not an exact match for the print version, the flexibility of the digital format could be considered an opportunity rather than a problem. Writers and publishers can use digital technology to offer new forms of expression and enhance readers' understanding. While these enhancements may be useful to readers in any form of publishing, for poetry they can mean the difference between making the poem accessible or not to people with print disability. Potential enhancements include:

- adding QR codes in the print format and hyperlinks in the digital one that link to a recording of the author reading their own work[3]
- using these techniques to link to writers' biographies and explanations of what inspired them to write each poem
- hyperlinking references in the text to sources that may help readers understand the poem better – for example, to information on other works of literature, natural history, writers, philosophers and historical events.

As well as supporting the needs of readers with print disability, such creative uses of technology can provide benefits for all readers.

3 See for example, *Off the wall*, an anthology of poems and short stories by the Somewhere Else Writers Group in the United Kingdom, developed with advice from the Royal National Institute of Blind People.

Fixed-layout (FXL) EPUB

Books that require the text and images to appear in a consistent way may need to be produced as fixed-layout (FXL) EPUB. Unlike a PDF, FXL EPUB file is created with a set of open specifications and it can be purchased through online retail stores, which is not always possible with PDF files.

FXL EPUB files remain important in the production of highly illustrated publications such as comic books, cookbooks and children's books. However, they are often partially or completely inaccessible to people with print disabilities. FXL EPUBs do not allow for an adequate level of customisation, as it is not possible to change the font, the text dimensions or the colour of the text or background. This makes them unsuitable for many readers with low vision and learning disabilities.

To improve the accessibility of FXL EPUB files:

- Follow the accessible design principles in design with regards to features such as the choice and size of typeface and the use of contrasting colours.
- Add alt text to images.
- Ensure that the reading order is correct and follows the visual order. Adobe InDesign exports the page content following the stacking order of objects on the page rather than their position on the page. This can cause issues for people using screen readers if the reading order is not set up logically.
- Add rich navigation (such as a table of contents, pagelists, HTML headings, ARIA attributes and landmarks).
- Add accessibility metadata.

When exported from Adobe InDesign, each individual word is usually wrapped in a span tag, so the words are read one by one. This feature can be used to introduce highlights at the word level for beginning readers with dyslexia, which is often undiagnosed at the age of children reading picture books. (A 2020 study in the United States estimated that up to 20 per cent of children are dyslexic.) In books for adult audiences, the whole phrase or sentence may be wrapped in the span tag, rather than the individual words, to make it easier to read. The coding can be remediated, but it would require a lot of work.

HTML

Books released online as Hypertext Markup Language (HTML) can be made accessible by making sure the correct HTML elements are used for the correct purpose at all times. As these are effectively websites, ensure that they comply with most of the web accessibility guidelines listed in the current version of the Web Content Accessibility Guidelines (WCAG) success criteria Level AA, and even Level AAA for navigational elements. Much of the advice relevant to EPUB is applicable here, as EPUB is a zip file containing HTML files, images and other files.

Digital hyperlinks

Make hyperlinks active and descriptive in digital text if possible (refer to the section on Hyperlinks in the "Design" chapter). The link keyword or phrase should describe where the link will take the reader. This is so users can scan the page quickly to find what they want, rather than having to read the surrounding sentences for the context if they are searching through a document. Descriptive link text also makes it easier for people to find what they are looking for when using the Search function.

Some screen readers also allow users to search through hyperlinks independently and create lists of hyperlinks for quick reference. This is possible and useful only if the hyperlink key phrases are meaningful and the links are distinguishable from one another:

- Use short phrases of only 3 to 5 words for the links.
- Don't use words or phrases such as "here" as link words (for example, "You will find some useful information here"), as this makes links indistinguishable from one another.
- Instead, use a short keyword or phrase as part of a sentence, such as the title of the destination page ("You will find some useful information on the IPEd website.").
- Put the link in a consistent place in the text throughout the publication, to make it easier to scan. Links placed consistently at the start or end of paragraphs are typically easier for people to find.
- If you have several links, provide them in a bullet list rather than running them all together in one sentence.

To create an accessible hyperlink for digital formats:

1. Check that the link is to an information source that is itself accessible (and not, for example, an inaccessible PDF or image).
2. Copy the link (URL) in the browser.
3. Type a meaningful keyword or phrase into the document.
4. Highlight the keyword or phrase and right click/tap on it.
5. Select the "insert link" function.
6. Paste the URL into the Address field.

ARIA role attributes

Apart from ensuring that the content is accessible, the digital files must be capable of being read by assistive technologies. This means complying with accessibility standards specific to the type of file. In the case of EPUB files, the addition of ARIA (Accessible Rich Internet Applications) role attributes to the epub:type attributes helps assistive technology convey structure that is implied by visual formatting. While epub:type attributes were designed to enhance the user experience in EPUB reading systems, most are not recognised by assistive technologies. Hence the need for ARIA – a web technology with a proven effectiveness.

ARIA role attributes allow for more precise semantic meanings to be applied to the epub:type elements. This helps users of assistive technologies to navigate to sections of an ebook (such as parts and chapters, front matter, body matter and end matter). Each piece of epub:type semantics can be mapped to an ARIA role attribute, for example: <section epub:type="chapter" role="doc-chapter">. In addition to ARIA role attributes, add ARIA landmarks (such as aria-label or aria-labelledby element) for components that a user is likely to want quick access to, and provide meaningful labels for each.

Unfortunately, Adobe InDesign only incorporates epub:type attributes at present in its EPUB creation process, and the ARIA role attributes and landmarks need to be added after export. In the case of some XHTML-based publishing platforms, the mapping of ARIA attributes happens automatically and there is no need for any remediation. Hopefully, in the future all ebook authoring software will automatically include ARIA attributes in the exported EPUB file. If you are outsourcing the ebook conversion process, check that ARIA attributes are included in the EPUB files.

Ebook metadata

Metadata is information about a book which makes it more discoverable, usable and useful. There are two types of metadata for ebooks: external (descriptive and administrative metadata) and internal (structural metadata and markup languages).

The external ONIX (ONline Information eXchange) metadata is used for capturing and communicating bibliographic data relating to books. It contains information about the title, creator, content, publication date, Book Industry Standards and Communications (BISAC) subjects and so on, including the intellectual property rights attached to content. This information is typically transferred to distributors as an XML file. It helps them to categorise, price and shelve books, as well as helping readers to find a book in the physical bookstore or online.

An ONIX record should also include information about accessibility, as it will help people with print disability and other intermediaries, such as librarians, to make purchasing decisions. The ebook accessibility details are available via ONIX codelist 196. While at this stage not many distributors make use of accessibility metadata, its inclusion in the ONIX file is good practice and ebook retailers and aggregators are gradually working out ways to make use of this information. (For example, Vitalsource and Redshelf both now display accessibility metadata.)

The internal metadata included in the OPF Manifest file is an integral part of EPUB 3. OPF stands for Open Package Format. It is an XML file with the extension .opf, which lists all of the contents of the EPUB, and "tells" the reading system what order to display the files in. Apart from bibliographic information, internal metadata includes structural data about an EPUB publication (or an EPUB rendition) and is thus the primary source of information about how to process and display that publication.

According to EPUB Accessibility 1.1 recommendations, EPUB publications must include Schema.org accessibility metadata . Schema.org is an open collaborative community with a mission to create, maintain and promote vocabulary schemas for structured data. Its metadata includes information about the accessible qualities of a publication:

- accessMode (for example, textual, visual, auditory, tactile)
- accessibilityFeature (for example, alternative text, extended descriptions, captions)
- accessibilityHazard (for example, flashing, motion simulation, sound)

- accessibilitySummary – a human-readable summary of the accessibility and any known deficiencies (for example, lack of extended descriptions, specific hazards)
- accessModeSufficient — a set of one or more access modes sufficient to consume the content without significant loss of information.

For example, a book with alt text and long descriptions should contain the accessibility metadata included in the OPF Manifest file (Figure 12.2).

The accessibility summary should be used to describe what is not accessible or is troublesome in an ebook, rather than repeating what is already in the metadata. This information is only visible on websites that expose Schema.org metadata.

Unfortunately, at this stage accessibility metadata needs to be added manually to an ebook file produced using Adobe InDesign, once the EPUB file has been exported.

Figure 12.2: Accessibility metadata for a book containing alt text and long descriptions

```
<metadata>
    <meta property="schema:accessibilitySummary">
        The publication is missing alternative text for complex diagrams.
        The publication otherwise meets WCAG 2.0 Level AA.
    </meta>
    <meta property="schema:accessMode">textual</meta>
    <meta property="schema:accessMode">visual</meta>
    <meta property="schema:accessModeSufficient">textual</meta>
    <meta property="schema:accessibilityFeature">structuralNavigation</meta>
    <meta property="schema:accessibilityFeature">alternativeText</meta>
    <meta property="schema:accessibilityFeature">longDescription</meta>
    <meta property="schema:accessibilityHazard">noFlashingHazard</meta>
    <meta property="schema:accessibilityHazard">noSoundHazard</meta>
    <meta
    property="schema:accessibilityHazard">noMotionSimulationHazard</meta>
    …
</metadata>
```

Source: The DAISY Consortium, Schema.org accessibility metadata, DAISY Accessible Publishing Knowledge Base.

If a publisher/book has been certified for accessibility, additional conformance/evaluation metadata should be included in the OPF file and the ONIX file.

Some publishers have also started including a brief statement inside the actual ebook with information about accessibility for readers, such as:

> This publication meets the EPUB Accessibility requirements and the Web Content Accessibility Guidelines (WCAG) 2.0 at the AA level. This book includes markup to enable accessibility and compatibility with assistive technology and contains various accessibility features such as table of content, landmarks, reading order, semantic structure, and alternative text for images.

While this statement is optional, and invisible to readers until they open the ebook, it demonstrates the publisher's commitment to inclusive publishing and raises awareness of the importance of producing books in accessible formats. The accessibility summary is often the only thing that is read concerning accessibility, so this feature is becoming increasingly important.

Digital rights management

Ensure that the digital rights management (DRM) system used does not prevent people with print disability from accessing content. All books should be accessible to assistive technologies and support different ways of reading, such as conversion to synthetic speech or refreshable braille. This includes the navigation of content, which should be accessible by alternatives to the mouse, such as trackball or pen mice.

Resources

Accessible Publishing Canada: Getting started with ARIA and EPUB
The DAISY Consortium:

- Accessible Publishing Knowledge Base
- Poetry
- Schema.org accessibility metadata
- WordToEPUB

International Publishing Forum (ITPF): EPUB type to ARIA role authoring guide
Laura Brady: EPUB accessibility using InDesign

ONIX for Books: Onix list 196: e-publication accessibility details
Microsoft: Make your Word documents accessible to people with disabilities
Software:

- Calibre
- Sigil EPUB Editor
- oXygen XML Editor
- Circular Software

World Wide Web Consortium (W3C):

- ARIA Authoring Practices Guide (APG)
- EPUB fixed layout accessibility

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Chapter 13
Audiobooks

The American Foundation for the Blind and Library of Congress Books for the Adult Blind Project established the Talking Books Program in 1931. Since then, talking books have remained one of the key formats used for making reading material available to people with print disabilities. Talking books were produced in Australia from about the early 1920s, recorded on LPs and later presented by elocutionists on live radio. The movement to create radio programs specifically for the "print handicapped" (RPH) did not begin in Australia until the 1970s, when a few programs were broadcast on Melbourne's 3ZZ access radio station and 3CR public radio station. Today, Vision Australia Radio continues to create talking books specifically for people with print disability. These are often read by volunteers.

The term "audiobook" came into use in the 1970s, when audiotapes began to replace records. Digital audiobooks first appeared in the 1990s. It wasn't until storage capacity improved on smartphones and other devices that audiobooks as we know them today became more user-friendly, via mobile apps, and accessible to the average consumer. Subsequently, the audiobook format moved away from being niche into becoming mainstream, commercially produced titles.

The increasing popularity of audiobooks in mainstream publishing is an exciting development for people with print disability. However, the experience of using audiobooks is not always optimal, as they are not necessarily produced with accessibility in mind.

Our engagement with and enjoyment of whatever we are reading is a crucial component of why we read, and people with print disability have as much right to (and need of) that component as everyone else. To make sure that audiobooks are fully accessible:

- include elements such as chapter navigation and image descriptions, as for other digital formats
- use mark-up in the recorded text that enables navigation through tables of contents, headings and page numbers. This will make the audiobook listening experience better for all users.

Talking books in the DAISY format have extensive navigation levels, which can be accessed through the user's keypad or buttons. For example, level 1 could be parts, level 2 chapters, level 3 section headings and level 4 paragraphs. Using these levels and the keypad, the user can navigate quickly and easily forward or back through the book. Digital talking books also allow users to increase or decrease the speed of reading using speech compression, which expands or cuts the pauses between words rather than just playing the book more slowly or quickly.

In an ideal situation, publishers would adopt the formatting associated with "talking books" in the DAISY format. However, Obi files (an open-source coding of audio files that allows DAISY to work effectively) are not currently accepted by audiobook sales platforms such as ACX (the Amazon-owned audio distribution body). It is hoped that in the future the formats will merge.

Types of narrated books

Books can be narrated in several different ways. The various formats include:

- human-narrated talking books and audiobooks
- auto-narrated audiobooks
- ebooks, which can be read using text-to-speech technology
- multimodal EPUB3 files (Read-aloud eBooks or Audio-eBooks), which contain embedded audio and media overlays.

The World Wide Web Consortium's (W3C) Synchronized Media for Publications Community Group is working on recommendations for the best way to synchronise media with document formats in publications that synchronise text and audio playback. (Once complete, their report will be published on the W3C website.) Amazon has developed WhisperSync technology that allows a listener to interchange between the Kindle book and audio for a more interactive and interchangeable content experience. This is also targeted at users learning languages.

While there is little functional difference between read-aloud artificial intelligence (AI) narrators and audiobook human narration, there is an experiential difference. Despite the technological advances, AI narrators are still poor at reading fiction, and at conveying humour and emotional experience. AI narration is, however, a suitable and affordable tool to improve access to backlist and nonfiction titles that do not warrant an investment in fully human-narrated audiobooks. The quality of AI narration may improve in the future too, as new

generations of AI narration are based on recordings of human narrators that help the software learn to speak more naturally.

Not all book genres will be suitable for the stand-alone audiobook format (for example, highly illustrated books, manuals or complex textbooks). This is due to the extent of text adaptation required and production complexities. It is also because listeners may find it difficult to understand the meaning of text read at a fixed tempo. At the same time, audio textbooks would greatly benefit learners with conditions such as dyslexia and low or no vision by providing an alternative way of engaging with content. Textbooks are great candidates for multimodal formats with embedded audio. At the very least, the text-to-speech function should be enabled in the ebook.

Interpreting the content

An audiobook is an interpretation of text in a different format. The level of interpretation required will depend on the context and genre.

Deciding whether to abridge audiobooks

The first decision concerns the type of recording: should it be unabridged or abridged? Broadcasters such as the ABC and BBC, which both started broadcasting book readings in the 1930s, typically abridged books to fit into broadcast time slots, and to be able to broadcast a bigger number of titles. Audiobooks were also created in abridged versions to lower the costs of production and to cater for the needs of time-poor readers.

These days, the market for abridged audiobooks is much smaller, and most audiobooks are produced unabridged. Space is not an issue with digital files, and listeners have the ability to change the playback speed or skip over sections of lesser interest. That said, in some contexts, abridging texts and cutting out extraneous material can make complex material easier to understand and hence more accessible for younger readers.

Making editorial alterations

While an unabridged audiobook should be an accurate reproduction of the print version, the text can be edited and adapted for audio delivery. However, the introduction of editorial changes remains a contentious issue. Some people with low or no vision consider making alterations to be offensive, even though the changes may make the content appropriate to the medium or technically more accurate. They consider that listening to an audiobook should be identical to

reading a print book, and the closer the formats can be brought together the better for all. These concerns should be included as part of the discussion at the planning stage, taking into account the genre of the book.

Some degree of editorial adaptation is unavoidable. The Round Table's *Sound advice guidelines* recommend that the choice of treatment of the text should be guided by 2 questions:

- What is most faithful to the author's intentions?
- What will make most sense to the listener?

Make alterations:

- if the text would not otherwise make sense in the audio format; replace references to the print edition with audio equivalents (such as changing "As you will read in this book …" to "As you will hear in this audiobook …")
- in situations where a literal narration would disrupt the flow of meaning of the text
- where sentences are too long for reading.

Deciding on the type of narration

There are various ways that a book can be narrated, and it is important to consider what type of narration would be best for the story:

- a fully voiced reading – a distinct voice is associated with each character in the story
- a partially voiced reading – a distinct voice is associated with one character in the story
- an unvoiced reading – the narration is devoid of any characterisation.

The narration can be performed by one, two or even a full cast of narrators in audiobooks that sit between performance and adaptation. In the latter, dialogue indicators (tags) written in the text are typically omitted.

There are 4 main categories of narrators:

- the book's author
- a professional voice actor
- a celebrity
- an amateur (unlikely to be employed in a commercial audiobook production, but common in the world of talking books).

The choice of narration, of the narrator(s) and the way they read or perform the book (such as employing specific intonations and accents and adjusting the

timbre of their voice) can impact the meanings of the text and experiences for the reader.

In a 2021 survey by the University of Sydney of adults with print disability, the quality of narration attracted the greatest number of responses to a question asking about annoying issues that make listening to audiobooks less enjoyable. A number of respondents complained that some narrators are simply poor or inappropriate, some are not familiar with the topic of the book, and others pronounce words incorrectly or spell out words unnecessarily. Many respondents also complained about monotone narration or inappropriate speed, either too slow or too fast. Several respondents also commented on the accent. Listeners seem to dislike accents that are unsuited to the context of the book; for example, using a narrator with an American accent when the characters are British.

To provide the best experience, the narrator's voice should match the writing style, the setting and the accent, age and gender of the characters. A dynamic form of narrating, where the narrator changes the tone of voice to fit the different characters, is preferred over monotone narration, but overdramatisation or the inclusion of music can be distracting. That said, music can add an element of description – particularly in children's books – that brings "colours" and "emotions" alive.

Finally, narrators should aim to maintain a consistent tone and read at a speed that is appropriate to the complexity of the text. For example, complex non-fiction publications should be read at a slower pace.

Preparing for recording

Before recording, prepare the text and decide on the approach that will be used to interpret it (refer to the section Making editorial alterations). Decide how to deal with any paratextual elements, such as:

- information on the book cover
- epigraphs
- footnotes and endnotes
- bibliographies
- any non-textual material, such as illustrations.

Similarly to ebooks, any visual material included in the print book must be described and read out by the narrator. Script in the alternative text descriptions developed for images, charts and so on, to ensure a coherent delivery by the narrator.

Footnotes and endnotes can be integrated into the text and narrated as part of the audiobook (in which case DAISY users are not able to skip over them) or recorded together in a separate file (which makes them difficult to access). When these elements are tagged properly (for example, in DAISY books), and the reading system is well designed, listeners can choose to listen to or skip features such as image descriptions and endnotes while listening to the main content.

An audiobook should include information about the treatment of the text, such as:

- omissions
- content warnings
- treatment of paratextual material
- useful details about the print layout
- any other aspects that may be of interest to the listener to ensure equitable experience.

There is no need to record the table of contents.

It is good practice to check if the book contains any words with unusual pronunciation before recording and ensure that the narrator is prepared. When choosing between alternative pronunciations, use the one that makes most sense to the character, time in history and location of the content. Foreign words should be pronounced as if read by a fluent speaker of that language, although this will depend on the skills of the narrator.

The Round Table's Sound advice guidelines provide detailed information on how to treat specific issues in the text, from abbreviations to brackets, italics, lists, page numbers, quotes, visual information and many other issues.

Recording

Most of the accessibility considerations described earlier are dealt with during pre-production. However, the director sometimes makes changes during the recording phase that may impact these considerations without having a clear understanding of what they are. The recording must therefore also be checked post production with accessibility issues in mind. Narrative checks can be undertaken by a producer or director as part of the production process while the text is being recorded. Any mistakes must be rerecorded and amended.

In addition to this process, a proofreader may also check the narration against the text after the recording has been completed.

Formatting files

In post-production, how the files are formatted is again open to accessibility considerations. Each section of the book should be a single audio file. This includes each chapter, short story or poem, as well as the title page, copyright, dedication and so on.

- Label the files consistently, with the section header read aloud.
- Ensure each file has a running time of no longer than 120 minutes. Files over 120 minutes are not supported. If a section is over 120 minutes long, find a good break in the narration and split the section into 2 files. Include a secondary section header on continuations. If the section begins with a header, such as "Chapter 2", start the second file with "Chapter 2 continued". This will help ensure listeners can easily navigate from section to section.
- To ensure the listening order is correct, begin with the chronological number, followed by the title of the section (for example, "01 Title page", "02 Dedication").
- Save the entire audiobook playlist in a single folder named with the title of the publication.

The files must:

- comply with the digital distribution requirements, which provide specific technical standards for audiobooks and individual files and can vary between providers
- be consistent in overall sound and formatting
- include opening and closing credits
- be comprised of all-mono or all-stereo files
- include a retail audio sample that is between 1 and 5 minutes long
- be free of extraneous sounds
- have 0.5 to 1 second of room tone at the beginning and 1 to 5 seconds of room tone at the end of each file
- measure between −23 dB and −18 dB RMS
- have −3 dB peak values
- have a maximum −60 dB noise floor
- have a constant bit rate (CBR) at 44.1 kHz.

CD formats require an uncompressed WAV file at 16 bit 44.1 kHz. Each CD cannot exceed 74 minutes and must be tracked at approximately 3 to 5 minutes.

Consider including supplemental content inside the audiobook package. This includes any images or PDF files, or alternative audio tracks read by different

narrators. Any supplementary material must be made to accessible publishing standards and declared in the metadata.

Adding navigation

Similarly to talking books, include appropriate mark-up in the audiobook file to make it possible to navigate the recorded text by chapter, section, subsection and page. Follow the specifications for navigation listed in the Audiobooks: W3C Recommendation 10 November 2020, which say that "An Audiobook is a collection of audio resources grouped together by a reading order, metadata, and resources, all contained in a manifest".

DAISY formatting can be incorporated once the audio masters in WAV format are available, using a program such as Obi (available only for Windows) or similar. DAISY formatting improves navigation (such as an option to move forward or back in chunks smaller than one chapter) and search capacity within an audiobook. Moreover, in DAISY audiobooks, readers can read or skip footnotes, sidebars, or information added specifically for users of the audio version. The amount of navigation is determined by the type of reading. For example, limited navigation by chapter or section may be sufficient for listeners of recreational audiobooks, while audio textbooks require more complex navigation to make them usable.

At this stage, however, it is not recommended that publishers add DAISY formatting themselves. As previously mentioned, the Obi files required for DAISY are not currently accepted by audiobook sales platforms such as ACX. If an author or publisher wants to donate their finished audiobook to a specialist library such as Vision Australia, the library staff will convert the files into the format best suited to their requirements.

Including audiobook metadata

Ensure your audiobooks are discoverable in library catalogues and on publishers' websites. Having comprehensive descriptive and administrative metadata (transferred via ONIX – refer to the section Ebook metadata) will help with this. Include information about the type of narration used in the audiobook, in addition to the standard bibliographic data. In some cases, other contextual information can also be important, such as the way in which text is set out on the page in the print version. If the text is laid out in an unusual manner (such as being shaped in a curve or a circle) or an unusual or decorative typeface is

Figure 13.1: **Accessibility data for an audiobook Manifest file**

```
"accessibilitySummary": "This publication conforms to WCAG 2.0 Level AA.",
"accessMode": ["textual", "visual"],
"accessModeSufficient" : [
    {
    "type": "ItemList",
    "itemListElement": [textual]
    }
],
"accessibilityFeature": ["structuralNavigation", "MathML", "alternativeText",
"longDescription"],
"accessibilityHazard": ["noFlashingHazard", "noSoundHazard",
"noMotionSimulationHazard"],
```

Source: **The DAISY Consortium, Schema.org accessibility metadata , DAISY Accessible Publishing Knowledge Base.**

used, inform audiobook users about this too, so that they can have an equivalent experience of the book.

As for ebooks, audiobooks should also contain internal metadata (structural metadata and markup languages).

Ensure each MP3 file has an ID3 tag to allow the reader to easily find key information about the audiobook and its section. ID3 is a metadata container which allows information about the file to be stored, such as the author, title of book, name of section, track number and year.

Apart from the descriptive information, the internal metadata included in an audiobook Manifest file (JSON) should include accessibility metadata as well as information about the audiobook: title, author, narrator, year of publication, duration and any supplemental material (Figure 13.1).

Adding digital rights management

The audiobook file should be able to be played on a wide range of devices, from dedicated talking book players to devices such as smartphones. To ensure this is possible, consider carefully what type of digital rights management is used with the audiobook file, so that all readers can have full access.

Resources

AccessiblePublishing.ca: Audiobook recommendations for publishers
ACX: ACX audio submission requirements
The DAISY Consortium:

- Obi quick start guide
- Schema.org accessibility metadata

Round Table on Information Access for People with Print Disabilities: Sound advice: guidelines for the production of audio materials for people with print disabilities (2nd edition)
W3C: Audiobooks (Recommendation 10 November 2020)

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Chapter 14
Quality assurance: reviewing and testing

Reviewing is not the same as testing. The review process is designed to check the content for accuracy, clarity and completeness, whereas testing focuses on checking the files to make sure everything works as it should.

Reviewing

Reviewers need to check for similar issues to those outlined in briefs for authors and vendors (see Part 1, Planning for inclusive publishing). Their role is to ensure what is being presented:

- is accurate and complete
- conveys the intended message (or is suitable for delivering the intended learning outcome, if there is one)
- is consistent with house style and design guidelines.

For this reason, the author and editor are usually the best people to review the content in detail. To assist in their work, it may be helpful to brief them on the types of issues to look out for. For example, a checklist for reviewing image descriptions could include the following questions:

- Is the description of what is in the image correct?
- Are all the key points covered in the description?
- Is the description succinct?
- Are any details provided that have been inferred rather than being visible in the image?
- Are any labels (or other text that is part of the image) included in the description?
- Is each item of information recorded only once?
- Is the information provided in a logical and consistent order?

- Is there any information in the image description that would be better described in the body text or caption, so that all readers have access to it?
- Are the vocabulary and terminology used appropriate for the target reading level?
- Is visual language avoided?
- Are there any spelling or grammar errors?
- For educational texts, can any questions relating to the image be answered from the image description, and does the description provide an appropriate level of information without handing the student the answer?

Reviewers with print disability can be of great help when testing the usability and accessibility of a text. However, they are not always suitable for checking content for completeness or accuracy without assistance. For example, a reviewer who cannot see a graphic, or who is not familiar with the subject, will not necessarily be able to tell if an image description is inaccurate or inappropriate, or if key details are missing. It is therefore better to engage reviewers with low or no vision to spot-check the general standard of the text after all automated and manual testing has been completed.

Testing

In addition to reviewing the content, digital formats need to be validated and tested for accessibility. It is impossible to perform a 100 per cent complete evaluation of accessibility requirements in a fully automated manner. Many criteria require human judgement and manual inspection.

The Accessible Publishing Learning Network has published 2 useful checklists for ebook quality assurance checking: simplified and advanced (refer to the Resources list at the end of this chapter). The use of extended checklists is particularly important when developing an inclusive publishing workflow. Once the workflow is developed, tested manually and confirmed to consistently produce accessible EPUB files, a simplified list can be used and some of the steps can be checked as part of an automated testing process.

EPUB files created in Adobe InDesign and those created in a conversion process using a PDF file are more likely to require proofreading to make sure the text is correct and doesn't contain odd hyphens or other issues. All EPUB files, regardless of the software used to produce them, require validation to make sure that they are technically correct and machine-readable.

Validation of EPUB is an internationally approved process of checking the code within books to ensure they display well on all kinds of devices. The rules were established by the International Digital Book Forum. The W3C provides a conformance checker for EPUB publications: a command line tool called EPUBCheck. They also provide a list of third-party apps (refer to the Resources list). One of the most popular is the Pagina EpubChecker.

Automatic testing

A number of accessibility checkers are available to check the machine-readability of specific files.

- MS Word has an embedded accessibility checker: Tools → Check Accessibility.
- Adobe PDF also has an embedded accessibility checker: Tools → Accessibility → Accessibility Check. It checks that alt text is present in all images and tables, while some elements must be reviewed manually (for example, to adjust the reading order or check the colour contrast).
- In addition to the inbuilt Adobe accessibility checker, software such as PDF Accessibility Checker (PAC) 2021 can check if a PDF meets accessibility requirements.
- The Ace by DAISY app, a tool developed by The DAISY Consortium, is the best way to check whether accessibility features have been implemented in EPUB files and if there are any issues. It comes in 2 versions: as a command line tool for full integration into a publishing workflow and as a desktop app. This tool performs automated checks to evaluate conformance to the EPUB accessibility specification against the rules defined in WCAG, ARIA, and HTML. Ace by DAISY does not claim to be a yes/no validator or a certification tool. It will not issue an accessibility score or percentage of conformance and it is not intended to be used for repairing inaccessible content. Instead, it lists issues that need to be resolved using other software before the file is tested again.

Manual checking

In addition to automatic testing, a manual checking of files should be performed using your computer's built-in reading tools. These are the most basic screen reader functions that people have access to. The bare minimum test is therefore to ensure that the text is read appropriately, including the implementation of alt

text. (Automatic testing tools will accept nonsense text in place of alt text, so check not only that alt text is present but also that it is correct.)

Use the:

- Read Aloud function for MS Word documents
- Read Out Loud function in Adobe Pro DC/Adobe Reader for PDFs (this can also check the reading order)
- Firefox Read Aloud extension for EPUB files.

You can also test for accessibility using a screen reader such as NVDA (free, for Windows only) or JAWS (for a fee). Unless you are proficient in using a screen reader, you may find it easier to install one of these programs on a computer that is used only for accessibility quality assurance. Different screen reader software interacts with text differently; for example, JAWS can pick up text in MS Word SmartArt graphics, whereas NVDA skips the graphic altogether. Often, the more sensitive software is also the more expensive.

Test EPUB files using ereading devices and applications such as Adobe Digital Edition, iBooks, Kindle Previewer or Kobo. View fixed-layout EPUB files on smaller screen sizes to check their impact on legibility and layout.

Finally, it is always good practice to engage readers with print disability to do a usability test, especially when first introducing an inclusive publishing workflow. It may not be practicable to do it for each project due to the time and expense involved. Conduct these tests after all the automated checks are carried out and all the issues they raise have been solved. And try to engage a range of people with different print disabilities to conduct the usability tests, as they will each have different needs.

Resources

Accessible Publishing Learning Network: Quality assurance of completed ebooks

The DAISY Consortium:

- Accessible Publishing Knowledge Base
- Ace by Daisy app

Screen readers:

- Freedom Scientific: JAWS
- Mozilla: Firefox add-ons: Read Aloud
- NV Access: NVDA 2022

W3C:

- Apps and tools
- EPUBCheck

References

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Glossary

accessibility: the qualities that make an experience (such as reading) open to all.

accessible publication: a publication that can be read by any reader, irrespective of the sense they use to access the content: vision, hearing, touch, or a combination of these senses. See also: accessibility, born-accessible publication, inclusive publishing

alt text: a short description of an image (other than one that is a purely decorative) or table that makes the information in it accessible to readers who cannot see it. (Alt text is an abbreviation for alternative text.) See also: image description, long description

alternative formats: publications in formats that offer an alternative to print. Alternative formats include braille, machine-readable electronic formats, audio and large print.

ARIA: a set of roles and attributes that define ways to make web content and web applications more accessible to people with disabilities. (ARIA is an acronym for Accessible Rich Internet Applications.)

assistive technologies: equipment, devices or systems that support the functioning and independence of people with disability. Assistive technologies for reading include print magnifiers, screen readers, braille, large print and talking books.

born-accessible publication: a digital publication that is designed from inception to be accessible to all readers. See also: accessibility, accessible publication, inclusive publishing

braille: a tactile reading and writing system made up of raised dots. See also: assistive technologies

CMYK: an acronym for colours used in the printing process: cyan, magenta, yellow and key (meaning black). See also: HEX, RGB

CSS coding: a markup language used to style HTML documents. (CSS is an acronym for cascading style sheets.)

digital-first workflow: a workflow in which a digital publication is produced and published first before the publication is printed. See also: format-neutral workflow, print-first workflow

digital rights management (DRM): the use of technology to manage access to copyrighted material in a digital format.

discoverability: the degree to which information or a book can be found in a search online or a database. Having accurate metadata, such as title, blurb and keywords, affects how discoverable a book is in a library database or online. See also: metadata

dyslexia-friendly typeface: a typeface specially designed for people with dyslexia that enhances the ease of reading and comprehension.

ebook: a book made available in a digital format that is readable on a computer or other electronic devices such as an e-reader, a tablet or a smartphone.

em and en rules: punctuation marks (dashes) of different lengths used in the English language to indicate a break or range. An em rule is the width of the letter M and an en rule is the width of the letter N.

end matter: sections of a book that appear after the main part of the content, such as the afterword, bibliography and index.

EPUB: an open-standard file format for digital books that uses the ".epub" file extension. It is a zipped file containing XHTML files with the content, as well as images and other supporting files. EPUB supports reflowable and fixed-layout content. It can be read using a variety of devices, including compatible ebook readers, tablets and smartphones, as well as computers. See also: fixed-layout (FXL) EPUB

e-reader: a handheld device designed to read digital books.

fixed-layout (FXL) EPUB: a type of EPUB file in which the content on the page remains static and does not reflow. It is typically used for highly illustrated publications such as children's books, cookbooks and magazines. See also: reflowable EPUB

font: variations in the size and style of characters for any particular typeface (for example, 9 point bold). See also: typeface

format-neutral workflow: a publishing workflow that allows for concurrent publishing of print and digital formats from a signal source file, usually hosted online in an XHTML-based platform. See also: digital-first workflow, print-first workflow

front matter: all content that appears before Chapter 1 in a book, such as the title page, table of contents and foreword.

HEX: a 6-digit code used to represent colour formats digitally. (HEX is an abbreviation for hexadecimal.) See also: CMYK, RGB

high-low books: books about high interest, age-appropriate subject matters that are written at a low reading level. Aimed at struggling readers, high-low books can help to build reading fluency, vocabulary and background knowledge.

HTML: the standard markup language for documents designed to be displayed in a web browser. (HTML is an acronym for HyperText Markup Language.)

hyperlink: a digital reference that links one place in a publication to another place in the same or a different digital publication.

image description: a written description or explanation of an image that is read aloud to users by screen reader software. An image description may be made up of alt text only (for images that are simple or of medium complexity), or alt text with an additional long description for complex images. See also: alt text, long description

imposter letters: characters that can be easily mistaken for one another in some typefaces (such as "i", lower-case "l" and the number "1").

inclusive publication: a publication that offers an equitable reading experience to all readers, irrespective of how they access the content.

keyboard shortcut: a key or combination of keys on a keyboard that provides quick access to a particular function within a computer's software or operating system.

LaTeX: a typesetting system and a markup language used for document preparation that has features designed for the production of technical and scientific documentation.

leading: line spacing.

lead lines: dotted lines in a table of contents to link the title to the page number.

learning disability: a usually lifelong condition that affects a person's ability to learn in one or more specific academic areas. Specific learning disabilities include dyslexia, dysgraphia and dyscalculia.

legibility: (in typography) the design of the typeface, the shape of the glyphs and how easily one character can be distinguished from another. See also: readability

long description: an extended image description, typically exceeding 250 characters, that is used to supplement the alt text for detailed or complex non-text elements. See also: alt text, image description

loose tracking: when letters are set so far apart from one another that they make the words lose their distinctive shapes.

MathML: an XML-based language for describing mathematical notation. (MathML is an abbreviation for Mathematical Markup Language.)

metadata: digital information that defines and describes data. There are 2 types of metadata: external (descriptive and administrative metadata) and internal (structural metadata and markup languages). External ONIX metadata is used for capturing and communicating bibliographic data relating to books (for both digital and print formats). Internal metadata is included in EPUB and audiobook files. It includes bibliographic information and structural data about the publication. Both forms of metadata should include information about accessibility. See also: EPUB, ONIX

mirror letters: pairs of characters (such as "d" and "b") that are exact mirror images of one another in some typefaces and can be easily confused.

monospaced typeface: a typeface in which all or most characters take up the same amount of horizontal space, regardless of a character's shape or width.

MS Word: an abbreviation for Microsoft Word, a word processor designed by Microsoft.

native file: the default file format created by the software program that originated the file.

nested list: a list within a list, set with an additional indent and using a different symbol (such as a dash) or numbering system (such as an "abc" list within a numbered list) for the second level.

occlusion: where part of an object is hidden behind another.

ONIX: an XML-based standard for book metadata, developed by EDItEUR, that allows a consistent method of sharing product information with publishers, retailers, and other supply chain partners. (ONIX is an acronym for ONline Information eXchange.)

OpenType typeface: a typeface format developed by Microsoft and Adobe in the 1990s that allows the end user to access additional features in a font.

OPF Manifest file: an XML file with the extension .opf that lists all the contents of an EPUB, and "tells" the reading system what order to display the files in. (OPF is an acronym for Open Package Format.)

pagelist: a list of all the pages in an ebook and how their corresponding page numbers in the print edition.

perceivable: (in inclusive publishing) presented to users in a way that they can perceive through one or more of the senses (vision, hearing or touch) used to read. For example, an image is perceivable to a user who is blind if an appropriate text description of it is provided. See also: understandable

print disability: The result of the interaction between people living with temporary or permanent health conditions and the barriers to reading they may experience when content is made available in print form only.

print-first workflow: a workflow in which a print publication is produced and published first, before the digital publication is produced. See also: digital-first workflow, format-neutral workflow

proportional spacing: a type of font spacing where the width of each character is not fixed but instead varies based on the shape of the character itself.

readability: (in design) how the text is arranged or typeset and how this affects the overall reading experience (rather than reading comprehension). See also: legibility

reflowable EPUB: a type of EPUB file in which the content on the page is reflowable. See also: fixed-layout (FXL) EPUB

remediation: the process of bringing a digital publication or a website into compliance with recognised standards of accessibility, with the goal of providing a better user experience for people with disability.

RGB: an acronym for the colour model (red, green and blue) used on a digital display screen. See also: CMYK, HEX

rich navigation: provides users with a wide range of options to navigate through a website or application. It typically includes a variety of visual cues, such as icons, images, and colours, to help users quickly identify and select the information they need.

screen reader: a form of assistive technology that translates the written text on a screen and renders it in speech (using a voice synthesiser) or braille output. See also: assistive technologies

semantic tags: digital labels that convey meaningful information about the elements enclosed between the opening and closing tags. The tags allow assistive technologies to help non-visual readers understand the document structure and what elements such as bolding or italics are being used to convey.

situational limitation: where a person's ability to hear, see, use their hands, concentrate or understand instructions is limited by their situation (for example, due to poor lighting). See also: print disability, temporary limitation

stacked headings: consecutive headings that have no text between them.

Styles (MS Word): combinations of formatting characteristics applied to text in order to change its appearance.

temporary limitation: where a person's functional ability to hear, see, use their hands, concentrate or understand instructions is limited by a temporary physical condition such as a broken arm. See also: print disability, situational limitation

text-to-speech software: an assistive technology that reads digital text aloud, using synthetic speech. It is also known as Read Aloud technology. See also: assistive technologies, screen reader

tight tracking: when characters touch one another, making them difficult to distinguish.

tracking: the space between letters.

typeface: a particular design of type (such as Calibri), distinguishable by its visual characteristics from other typefaces. See also: font

understandable: presented in a way that is capable of being understood. For example, a discussion of data in a graph is understandable to someone with colour blindness if it refers to the graph labels, but it may not be if it refers only to the colours of the lines. See also: perceivable

Unicode: A universal standard for encoding characters. A unique digital code is applied to each letter, number or symbol, allowing it to be recognised across all platforms, programs or languages.

URL: a unique address for a website or webpage. (URL is an acronym for Uniform Resource Locator.)

W3C: an international, public-interest organisation that develops open standards for the web. (W3C is an acronym for World Wide Web Consortium.)

WCAG: the international standard for digital publications, developed by the World Wide Web Consortium (W3C). (WCAG is an acronym for Web Content Accessibility Guidelines.) WCAG levels A, AA and AAA define the requirements for making web content accessible to people with disabilities. An EPUB, a website or a web application that achieves WCAG 2.0 Level A compliance is considered to have met the minimum standard for accessibility. WCAG 2.0

Level AA compliance is considered to have met the acceptable standard for accessibility. WCAG 2.0 Level AAA is considered optimal, as it is the highest level of accessibility compliance, but it may not always be feasible or practical for all EPUB files or websites.

XHTML: a markup language designed to be an XML-compliant version of HTML, which means that it adheres to strict rules of syntax and structure. (XHTML is an acronym for eXtensible HyperText Markup Language.) See also: HTML, XML

XML: a markup language used for describing data, designed to be both human- and machine-readable. Unlike HTML, XML tags are not predefined. They are defined by the creator of the XML document, and hence this language is flexible and extensible. (XML is an acronym for eXtensible Markup Language.) See also: HTML, XHTML

Style sheet template

The following template is provided to help you prepare style sheets for accessibility best practice. The suggestions can be incorporated into house style sheets for general reference or adapted for individual projects. You may also wish to expand the instructions to cover other accessibility issues specific to your title, such as the preferred use of hyperlinks or how to address gendered language in image descriptions, depending on the context.

Headings:

- Sequential heading levels.
- No stacked headings: each heading must have at least one sentence underneath it.
- No repeated headings.
- Key information goes at the beginning of the heading.
- Headings sentence case.

Formatting:

- Bold for emphasis (not italics where possible), styled as "Strong".
- If italics must be used for emphasis, use the "Emphasis" character style.
- Use the italic tool for italicising titles of elements such as Acts of Parliament.
- Do not use all caps.
- Avoid title case (except for the titles of academic journals). Book titles take sentence case italics: *Books without barriers*.
- Extended quotes roman and block indented.

Figures and tables:

- Number consecutively by chapter: Table 1.1., Table 1.2; Figures 1.3a to 1.3c.
- Figure and table numbers and captions go above the illustration.

Cross-references:

- Cross-reference to numbers where available: Table 7.2.
- Cross-reference to distinct headings if numbering is not available: Refer to the section, "Cross-references".
- Provide descriptions for more general cross-references: earlier/later in the chapter; the previous/following paragraph (not, the paragraph above/below).

Punctuation:

- Double quote marks for short quotations; single quote marks for quotes within quotes.
- Spaced en rules for dashes before or around explanations and further information (or use commas, parenthesis and semicolons instead).
- Use en rules for number spans for technical data and financial years only. Avoid en dashes for spans in general text: between 6 and 9 years (not 6–9 years).

Abbreviations, acronyms and symbols:

- Full stops after abbreviations: 8 a.m., 7 p.m.
- Avoid Latin abbreviations in body text. Use "for example", "such as", "that is", "and so on" (not e.g., i.e., etc.).
- Explain acronym or abbreviation the first time it is used, giving full name first followed by acronym: Institute of Professional Editors (IPEd).
- Full name before symbol: Copyright ©

Lists:

- Keep nested lists to a maximum of only 2 levels where possible.
- Bullet points: first level a round solid bullet, second level further indented with a dash.
- Numbered lists: first level numerals, second level further indented an abc list. Full stop after numerals (1., 2.) and letters (a., b.).

Numbers:

- Numerals for all numbers other than zero and one in general sentences, unless at the start of a sentence or the number is intended to be non-specific.

- All numerals for mathematics, measurements and technical data.
- Comma separators in thousands: 1,000, 13,000, 100,000.
- Millions and billions in numbers and words: 6 million, 8 billion.
- No superscripts in ordinals: 21st (not 21st).

Reference lists:

- Minimal punctuation.
- Space between author initials, with no full stops after the initial: Jones, A B

Example: Browne, G, Wright, J and Coombs, M (2013). EPUB3 indexes and the future of indexing, *The Indexer*, September, 31(3),110–121.

Image descriptions:

- Present tense and active verbs: A cat sits on a windowsill.
- No italics or bold.
- Follow the style, spelling and terminology used in the body text.

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