General techniques (Useful for persons with Down syndrome)

**Emphasis structure**

Use headings and labels describe topic or purpose.

Simple colored headings with fonts two size larger than general content to aid navigation skills

**Explanation and who it helps:**

This supports those who have reading and some visual perceptual difficulties due to the intellectual disabilities associated with Down syndrome. It also helps others with general cognitive learning disabilities, where long sentences and complex words can cause difficulties.

**Use for tags:** Down syndrome, intellectual disabilities, and cognitive disabilities

**Avoid for tags:**

**Pass examples:**

**Failure examples:**

**Sources/research:**

**Language**

**Explanation and who it helps:**

See and Learn (http://www.seeandlearn.org/en/gb/default.aspx) offers step-by-step, illustrated activities designed to promote the development of language, reading, speech, memory, and number skills. Check especially the free downloads of language and reading resources.

 **Use for tags:** Down syndrome, intellectual disabilities, and cognitive disabilities

**Avoid for tags:**

**Pass examples:**

**Failure examples:**

**Sources/research:**

<http://www.seeandlearn.org/en/gb/resources/>

"Speech and Language Resource Guides for Individuals with Down Syndrome," by Libby Kummin (http://www.ndsccenter.org/?page\_id=66) - a series of nine helpful guides from first word and phrases to adults.

Ensure that

* icons, controls and menus are located in consistent and non- distracting areas.
* highlight key points in bold - (be careful not to overuse, because it feels like shouting)
* text boxes to highlight important information”
* helpful to use clear writing style
* use easy to understanding could cause confusion
* words and avoid complicated content, when possible

**Explanation and who it helps:**

Speech and language treatments for people with Down syndrome developing ages.

**Pass examples:**

**Failure examples:**

**Sources/research:**

Libby Kumin's "Comprehensive Speech and Language Treatment for Infants, Toddlers, and Children with Down Syndrome" (http://www.dshealth.com/speech.htm)

“Top Five Instructional Tips for Students with Down syndrome” <http://specialedpost.org/2013/01/31/top-five-instructional-strategies-for-students-with-down-syndrome/>

“Down syndrome and Learning” http://inclusive.tki.org.nz/guides/down-syndrome-and-learning/

**Use lists**

Ensure that:

* bullet points are well spaced
* a minimal number of words are used (e.g.5)
* Lists are not cluttered by surrounding items
* Keywords are meaningful to the main points
* Design is clean and easy to navigate to avoid confusion

**Explanation and who it helps:**

This supports those who have reading difficulties due to general cognitive learning disabilities associated with Down syndrome.

**Pass examples:**

**Failure examples:**

**Sources/research:**

Stroke Association Accessible Information Guidelines <http://www.stroke.org.uk/professionals/accessible-information-guidelines>

“Top Five Instructional Tips for Students with Down syndrome” <http://specialedpost.org/2013/01/31/top-five-instructional-strategies-for-students-with-down-syndrome/>

“Down syndrome and Learning” http://inclusive.tki.org.nz/guides/down-syndrome-and-learning/

**Use presentation to show structure**

Include a short introduction to summarize content

* divide the information into topics
* keep main information to the top left where the eye goes first in English (consider localization for right to left languages such as Arabic)
* use white space to define areas
* include an index
* keep linking images simple and explanatory i

**Explanation and who it helps:**

This supports people with Down syndrome and this also will support other persons with intellectual and cognitive disabilities. Plus it helps persons with specific learning difficulties as well as those with general cognitive learning disabilities.

**Pass examples:**

**Failure examples:**

**Sources/research:**

“Top Five Instructional Tips for Students with Down syndrome” <http://specialedpost.org/2013/01/31/top-five-instructional-strategies-for-students-with-down-syndrome/>

“Down syndrome and Learning” http://inclusive.tki.org.nz/guides/down-syndrome-and-learning/

**Use symbols to show meaning**

* Clear symbols that have allow users with down syndrome to make a good guess, have translucency and offer transparency can aid understanding
* Symbols as an addition to short sentences can aid meaning

**Explanation and who it helps:**

This supports those who have general intellectual or cognitive learning disabilities.

**Pass examples:**

**Failure examples:**

**Sources/research:**

“Top Five Instructional Tips for Students with Down syndrome” <http://specialedpost.org/2013/01/31/top-five-instructional-strategies-for-students-with-down-syndrome/>

“Down syndrome and Learning” http://inclusive.tki.org.nz/guides/down-syndrome-and-learning/

**Also see:**

* Info and Relationships: Information, structure, and relationships conveyed through presentation can be programmatically determined or are available in text. (WCAG 1.3.1 Level A)
* Headings and Labels: Headings and labels describe topic or purpose. (WCAG 2.4.6 Level AA)
* Consistent Navigation: Navigational mechanisms that are repeated on multiple Web pages within a set of Web pages occur in the same relative order each time they are repeated, unless a change is initiated by the user. (WCAG 3.2.3 Level AA)
* Consistent Identification: Components that have the same functionality within a set of Web pages are identified consistently. (WCAG 3.2.4 Level AA)

 **Use A Clear Writing Style**

Ensure that

* the message is clear
* extraneous information is removed
* one message is delivered at a time
* Key points are separated out
* Lists and bullet points are used
* Order of statements is logical
* Repeat important points to aid in comprehension

**Explanation and who it helps:**

This supports persons with Down syndrome and also help people with reading and some visual perceptual difficulties. Additionally it supports persons with general cognitive learning disabilities, where long sentences and complex words can cause difficulties.

**Pass examples:**

**Failure examples:**

**Sources/research:**

"Down Syndrome Issues and Information: Reading, Writing and Literacy" (http://www.down-syndrome.org/information/reading/)

 **Give instructions clearly.  Avoid long sentences.**

* use short concise sentences
* leave plenty of space between lines
* use at least 1.5 spacing between lines

**Explanation and who it helps:**

**Pass examples:**

**Failure examples:**

**Sources/research:**

**Articulation and Phonology.**

**Explanation and who it helps:**

Many persons with Down syndrome have communications issues however AT is allowing them to communicate more effectively than in the past. Many people with Down syndrome use ICT including smart phones, websites, tablets, apps and PC’s. One example is a young woman named Sara with Down syndrome aged 27 in the United States. She is on several social media tools (Twitter, Instagram, Facebook and Pinterest), she has an iPhone, Kindle, IPAD and Mac Air. She uses email and text to communicate with friends. Her Mom does supervises the activity, often helps with spelling and sometimes helps with difficult words. Sara has some communications APPs that also help her engage with this ICT. Sara took to the iPhone and iPad much quicker than her parents. She is also plays games on the Wii and XBox and sometimes enjoys engaging with other players online. Another favorite is Word with Friends but she sticks to small words.

**Pass examples:**

**Failure examples:**

**Sources/research:**

(http://itunes.apple.com/us/app/dragondictation/id341446764?mt=8)

**Explanation and who it helps:**

Looks at the use of Visual Phonics to improve speech intelligibility in individuals with Down syndrome.

**Pass examples:**

**Failure examples:**

**Sources/research:**

"A Facilitating Technique to Improve Speech Intelligibility in Individuals with Down's Syndrome" by Simalee Smith-Stubblefield and Karen Guidi (http://www.riverbendds.org/visualphonics.html)

**Avoid double negatives.**

* It is important to avoid sentences that contain double negatives or dependent clauses. These types of sentences can be very confusing for persons with Down syndrome.

**Explanation and who it helps:**

These sentences tend to be grammatically incorrect and confusing – their use should be avoided for many persons with Down syndrome and other people with specific learning difficulties as well as those with general cognitive learning disabilities.

**Pass examples:**

**Failure examples:**

**Sources/research:**

"Down Syndrome Issues and Information: Speech and Language" (http://www.down-syndrome.org/information/language/)

"Speech and Language Therapy for children with Down Syndrome" (http://www.ndss.org/index.php?option=com\_content&view=articl e&id=138:speech-a-language-therapy&catid=51:therapies-adevelopment&itemid=142&showall=1)

“Down syndrome 101 for Educators” http://downsyndromeinfo.org/wp-content/uploads/2014/03/Down-Syndrome-101-for-Educators-DSIA-Presentation.pdf

**Be concise**

* + Repeat salient points to aid in comprehension
	+ Choose words that are in general use
	+ Use common words that are easily understood
	+ Make the meaning clear and concise
	+ Avoid hyphenated words and acronyms
	+ Be factual
	+ Avoid multiple points in one sentence i

**Explanation and who it helps:**

This supports those who have reading and difficulties due to general cognitive learning disabilities, where long sentences and complex words can cause difficulties.

**Pass examples:**

**Failure examples:**

**Sources/research:**

“Top Five Instructional Tips for Students with Down syndrome” <http://specialedpost.org/2013/01/31/top-five-instructional-strategies-for-students-with-down-syndrome/>

“Students with Down syndrome” http://www.downssa.asn.au/\_\_files/f/3203/A%20Student%20with%20Down%20Syndrome%202014.pdf

**Include short tooltips on all icons, jargon**

These is helpful to most persons with Down syndrome. Sometimes a persons with DS can get confused and distracted. If tooltips are to be used they must precise and relate directly to the object.

**Explanation and who it helps:**

The amount of help offered by tooltips depends on the individual with Down syndrome and their specific abilities as do many of the techniques above.

**Pass examples:**

**Failure examples:**

**Sources/research:**

**Notes/ sources:**

From WCAG:

* Guideline 3.1 Readable: Make text content readable and understandable.
* Unusual Words: A mechanism is available for identifying specific definitions of words or phrases used in an unusual or restricted way, including idioms and jargon. (3.1.3 Level AAA)
* Abbreviations: A mechanism for identifying the expanded form or meaning of abbreviations is available. (3.1.4 Level AAA)
* Reading Level: When text requires reading ability more advanced than the lower secondary education level after removal of proper names and titles, supplemental content, or a version that does not require reading ability more advanced than the lower secondary education level, is available. (3.1.5Level AAA)
* Pronunciation:  A mechanism is available for identifying specific pronunciation of words where meaning of the words, in context, is ambiguous without knowing the pronunciation. (3.1.6 Level AAA)

**Font and Layout**

Ensure that

* + There is white-space around blocks of text
	+ Left justification
	+ font size is between 14 and 18 pt
	+ there is no change in font style
	+ sans serif font is used such as Arial and Calibri
	+ capital letters are used sparingly e.g. first word only and names
	+ Take care to use bold text just for key items
	+ Make important information two font sizes bigger
	+ Try to avoid the underlining of text - where hyperlinks may have the default underline ensure they have a different color
	+ Repeat salient points to aid in comprehension

**Explanation and who it helps:**

These are sensible clear reading guidelines for all and can support those with a wide range of disabilities and reading difficulties including those with cognitive learning disabilities.

**Pass examples:**

**Failure examples:**

**Sources/research:**

iAm I making myself clear? Mencap’s guidelines for accessible writing <http://www.easy-read-online.co.uk/media/10609/making-myself-clear.pdf>

“Top Five Instructional Tips for Students with Down syndrome” <http://specialedpost.org/2013/01/31/top-five-instructional-strategies-for-students-with-down-syndrome/>

“Down syndrome and Learning” http://inclusive.tki.org.nz/guides/down-syndrome-and-learning/

**Enough Time**

Timed events should be avoided – if they are necessary there need to be clear controls, pauses and the ability to return to the original point and an alternative is included.

**Explanation and who it helps:**

Timed events can be frustrating for persons with Down syndrome and cause stress and confusion.

**Pass examples:**

**Failure examples:**

**Sources/research:**

**No Loss of data**

Data needs to be held, saved and available if web-pages are refreshed by accident, closed or new tabs are opened. There needs to be the ability to return to forms partially filled and the ability to save content but security issues may prevent this on some websites.

**Explanation and who it helps:**

This helps most persons with Down syndrome. If these steps cannot be done because of security problems than provide alternatives means to get to the data.

**Pass examples:**

**Failure examples:**

**Sources/research:**

“Who needs more time on tests?” <http://www.betterevidence.org/issue-13/who-needs-more-time-on-tests/>

Lovett BJ (2010), Extended Time Accommodations for Students with Disabilities: Answers to Five Fundamental Questions, *Review of Educational Research*, 80, 611–38.

Lovett BJ and Leja AM (2013), Students’ Perceptions of Testing Accommodations: What We Know, What We Need to Know, and Why It Matters,*Journal of Applied School Psychology*, 29, 72–89.

Phillips SE (1994), High-Stakes Testing Accommodations: Validity versus Disabled Rights, *Applied Measurement in Education,*7, 93–120.

**Notes/ sources**

**From WCAG**

* Timing Adjustable: For each time limit that is set by the content, at least one of the following is true: (WCAG2.2.1 Level A)
* Pause, Stop, Hide: For moving, blinking, scrolling, or auto-updating information, all of the following are true: (2.2.2 Level A)
* No Timing: Timing is not an essential part of the event or activity presented by the content, except for non-interactive synchronized media and real-time events. (2.2.3 Level AAA)
* Re-authenticating:  When an authenticated session expires, the user can continue the activity without loss of data after re-authenticating. (2.2.5 Level AAA)

**Build trust**

* Provide context sensitive help
* Glossary of complex words
* Images that represent objects rather than stylized icons or symbols
* Systematic use of color with simple headings
* Adding an image under a sentence to aid understanding
* Consistent navigation

**Explanation and who it helps:**

This supports persons with Down syndrome as well as those with general cognitive learning disabilities

**Pass examples:**

**Failure examples:**

**Sources/research:**

“Top Five Instructional Tips for Students with Down syndrome” <http://specialedpost.org/2013/01/31/top-five-instructional-strategies-for-students-with-down-syndrome/>

“Down syndrome and Learning” http://inclusive.tki.org.nz/guides/down-syndrome-and-learning/

**Prevent errors**

* Clear navigation
* Clear controls with contrasting colors and shapes
* Ability to return to a task

**Explanation and who it helps:**

Clearly this aids all website users

**Pass examples:**

**Failure examples:**

**Sources/research:**

**Notes/ sources**

**From WCAG**

* Error Prevention (Legal, Financial, Data): … (3.3.4 Level AA)
	+ Reversible: Submissions are reversible
	+ Checked: Data entered by the user is checked for input errors and the user is provided an opportunity to correct them.
	+ Confirmed: A mechanism is available for reviewing, confirming, and correcting information before finalizing the submission.
	+ Error Prevention (All): For Web pages that require the user to submit information, at least one of the following is true: (3.3.6Level AAA)
	+ Help: Context-sensitive help is available. (3.3.5 Level AAA)

**Attention techniques**

Ensure that

* + Consistent Navigation
	+ Repeat Salient Points
	+ There are no distracting elements such as blinking text
	+ Scrolling banners are avoided
	+ Text is kept to narrow columns in the center of the site
	+ White space is used around text
	+ Clutter is avoided
	+ Extraneous and inconsequential media events are avoided
	+ No sudden changes occur on the site

**Explanation and who it helps:**

Those with Down syndrome sometimes have visual and audio perceptual difficulties and can be confused by sudden interruption and distracting happenings.  Attention may be poor and there is a need to have time and space to concentrate on the task in hand.

**Pass examples:**

**Failure examples:**

**Sources/research:**

“Top Five Instructional Tips for Students with Down syndrome” <http://specialedpost.org/2013/01/31/top-five-instructional-strategies-for-students-with-down-syndrome/>

“Down syndrome and Learning” http://inclusive.tki.org.nz/guides/down-syndrome-and-learning/

# “An attempt to improve auditory short-term memory in Down's syndrome individuals through reducing distractions.” <http://www.ncbi.nlm.nih.gov/pubmed/2974601>

**Notes/ sources**

From WCAG

* Interruptions: Interruptions can be postponed or suppressed by the user, except interruptions involving an emergency. (WCAG 2.2.4Level AAA)
* Low or No Background Audio(WCAG1.4.7 Level AAA) …

**Augmentative and alternative communication**

**Explanation and who it helps:**

An overview of Signing and Lexical development in children with Down syndrome, as well as its effects on cognitive understanding.

**Pass examples:**

**Failure examples:**

**Sources/research:**

“Signing and Lexical Development in Children with Down Syndrome by John Clibbens also appeared in Down Syndrome Research and Practice. <http://www.downsyndrome.org/reviews/119/?page=1>

 “Using Sign Language with Down syndrome” <http://www.about-down-syndrome.com/sign-language-in-down-syndrome.html>

**Explanation and who it helps:**

Discusses how use of simultaneous signs supports the formation of spoken language.

**Pass examples:**

**Failure examples:**

**Sources/research:**

"Down Syndrome and Sign Language Benefits" (http://www.babies-and-sign-language.com/downssyndrome.html)

**Fluency**

**Explanation and who it helps:**

How to avoid getting stuck, stuttering and Dysfluency in those with Down syndrome and level of success of different treatment approaches.

**Pass examples:**

**Failure examples:**

**Sources/research:**

"What Can We Do about Dysfluency, Stammering, Getting Stuck?" (http://www.downs-syndrome.org.uk/images/stories/DSAdocuments/Publications/speechlanguage/dysfluency\_stammering\_getting\_stuck.pdf) [PDF] by Leela Baksi from the Down’s syndrome Association newsletter.

"Dysfluency, Stuttering and Down syndrome" (http://www.riverbendds.org/index.htm?page=stutter.html) by Monica Bray.

"Stuttering and Down Syndrome Abstracts" (http://www.riverbendds.org/index.htm?page=bray.html) by Monica Bray (2006).

"The Nature of Dysfluency in Down's Syndrome" (http://www.riverbendds.org/bray.html)

"Treating Children with Down Syndrome Who Stutter"( http://www.mnsu.edu/comdis/isad11/papers/eckardt11.html) by Judith Eckardt.

"Down's Syndrome and Stuttering," a brochure from the Stuttering Foundation.

"The nature of Dysfluency in Down's Syndrome," (http://www.stammering.org/downs\_survey.html) Monica Bray.

**Additional Resources**

• "Memory development for individuals with Down syndrome" (http://www.downsyndrome.org/information/memory/overview/Default.aspx?page= 7#Implications\_for\_activities)

• "Noah's minute," (http://noahsdad.com/noahs-minute/) an archive of minute-long daily videos, many demonstrating appropriate activities being introduced.

• "Supporting Children with Down Syndrome,"(http://www.tes.co.uk/downs-syndrome-sen-teachingresources) a guide for teachers on the best strategies to use in the mainstream environment (available only on Windows). Finally, although not all of the articles are freely available online, searching on the key words "Down Syndrome" on SpeechBITE, (http://www.speechbite.com/) the Australian Speech Pathology Database for Best Interventions and Treatment Efficacy, uncovers 32 research articles.