# About this document

This document was produced under U.S. Department of Education, Office of Special Education Programs Grant No**.** H327T090001. Michael Slade served as the project officer. The views expressed herein do not necessarily represent the positions or polices of the Department of Education. No official endorsement by the U.S. Department of Education of any product, commodity, service or enterprise mentioned in this publication is intended or should be inferred. This product is public domain. Authorization to reproduce it in whole or in part is granted.

While permission to reprint this publication is not necessary, the citation should be as follows: \_\_\_\_\_. (2013). Accessible Learning Materials—Publisher/Developer Best Practices Guidelines. Wakefield, MA: National Center on Accessible Instructional Materials. Retrieved from <http://aim.cast.org/learn/practice/palm/best_practices>

# Introduction

The growing field of digital learning materials holds a great deal of promise. Content presented in digital formats can be created to be effective for learners with a wide range of needs. Of course, to reach all learners, including those with disabilities, gifted and talented learners, struggling learners, and English language learners (ELLs), materials must be accessible from the start. Accessible materials are materials that all learners can perceive, understand, and utilize to accomplish their educational goals. However, creating learning materials that are usable for such a wide range can be challenging for publishers and developers. Therefore, to support the [PALM (Purchase Accessible Learning Materials) Initiative](http://aim.cast.org/learn/practice/palm) (a national initiative focused on encouraging purchasers to buy, and publishers and developers to create, accessible learning materials) the [National Center on Accessible Instructional Materials](http://aim.cast.org/) (AIM Center) prepared this document, “Accessible Learning Materials—Publisher/Developer Best Practices Guidelines” to provide best practices to developers and creators of accessible learning materials.

Since the field is relatively new, guidance on how to create effective, accessible materials has been fragmented, and numerous standards have been created. This, however, is beginning to change. The [WCAG 2.0 (Web Content Accessibility Guidelines)](http://www.w3.org/TR/WCAG) is widely used in the United States; of note is its potential adoption with the [Section 508 refresh](http://www.access-board.gov/508.htm), and its inclusion in Europe under the M376 Mandate, “[Accessibility requirements for public procurement of ICT products and services in Europe](http://www.mandate376.eu/).” Further clarification has come from the [DAISY Standard](http://www.daisy.org/) being included within [ePUB3](http://idpf.org/epub/30) (an e-book industry standard created by the International Digital Publishing Forum [IDPF]), allowing publishers to create accessible e-books that include rich media. The requirements for publishers in terms of accessibility are becoming clearer.

Applying such standards can be difficult for individuals who do not have prior experience creating accessible learning materials. Many organizations have created accessibility principles and best practices to help publishers and designers. Though similarities clearly exist between these lists, they are incomplete. Currently they do not provide new designers and publishers of accessible materials with a clear starting point nor are the lists comprehensive enough to apply to multiple contexts. Further, there has been little work to synthesize or to organize the information in a comprehensive, useful way.

## How this list was developed

In order to begin synthesizing guidance, the AIM Center reviewed web-based resources on accessibility from the fields of design, development, and publishing for best practices and key principles. The guiding question was, “What are essential best practices to ensure learning materials are accessible to the widest range of learners?” The resulting list, which was developed after an extensive review of resources, provides best practice guidelines and includes examples of what these guidelines look like in practice.

To make these best practice guidelines applicable to a variety of learning materials, a broad view was taken of topics to include. As such, a comprehensive review of resources was conducted to find best practices and principles on the following topics:

* Web site accessibility
* Document accessibility
* Video accessibility
* Image accessibility
* Audio accessibility

After extensive review, the AIM Center decided to sort the list around the [Web Accessibility Initiative](http://www.w3.org/WAI/)’s (WAI’s) document “[How People with Disabilities Use the Web](http://www.w3.org/WAI/intro/people-use-web/principles).” The principles listed in this WAI document and the WCAG 2.0 principles (perceivable, operable, understandable, robust) are explicitly referenced in the organization and phrasing of these guidelines, and are reflected in the goals and the language of the principles. (Please see the glossary at the end of this document for an explanation of terms, acronyms, abbreviations.) Although these lists have been carefully aligned, some changes were made where necessary to reflect information found in our survey of other standards, best practices, and checklists. The resulting guidelines are recommended for those who are not previously familiar with creating accessible learning materials and are applicable when developing accessible materials.

## What the guidelines do not address

**Implementation** of accessibility for specific learning materials or media types was not examined. For example, the most effective ways to design a Microsoft PowerPoint presentation

or an Adobe PDF (portable document format) was not specifically addressed. A broad approach was taken, so that the list remains applicable to each of these particular contexts. This can be complemented by existing/future technical guidance for specific media types.

The **instructional methods** for effectively implementing accessible content in learning settings were also not addressed. Instead, the guidelines focus on content accessibility and usability. As educational psychology and technology professor Richard Clark has pointed out, much of why materials are effective or ineffective has to do with how they are designed and subsequently used in learning environments, so methods are important to address when using learning materials. However, this topic falls outside of the current scope of this document. For more information about how to design and implement tools that are more effective in fostering learning, please refer to best practices for effective implementation in an educational setting such as the [Universal Design for Learning Guidelines](http://www.udlcenter.org/aboutudl/udlguidelines).

Finally, not included are descriptions and details of the **requirements of disability law**. This document does not detail legal requirements and statutes for digital materials regarding K–12 educational materials, nor does it focus on civil rights legislation such as the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act. For more information on some of these requirements, please review a paper by the Center on Online Learning and Learners with Disabilities called “[Foundation of Online Learning and Learners with Disabilities](http://centerononlinelearning.org/wp-content/uploads/Foundation_7_2012.pdf).” This paper provides additional information about important statutes such as Section 508 of the Rehabilitation Act, the Assistive Technology Act, and the Individuals with Disabilities Act, as well as an overview of how these interplay with civil rights legislation.

## Structure of the guidelines

This best practice list has three primary, nested levels named *goals*, *guidelines*, and *examples*.

1. ***Level 1—Goals:*** The first level aligns directly to the four WCAG categories of perceivable, operable, understandable, and robust, and works to provide an organizational structure to the subsequent guidelines. The elements at this level are phrased as goals. This was done to show what successful implementation of the guidelines would result in for students. For each of these an explanatory paragraph is provided to ensure that the goal is clear.
2. ***Level 2—Guidelines:*** The second level consists of best practice guidelines. These provide general guidance on how to meet Level 1 goals. Where possible, these guidelines have been aligned to the WAI’s “How People with Disabilities Use the Web” document referenced earlier.
3. ***Level 3—Examples:*** The final level contains specific examples of what each Level 2 guideline looks like when implemented successfully within learning materials. The intention is to provide examples to help guide developers in understanding what these best practices might look in practice.

As learning materials and new accessibility practices emerge, this list will evolve. Ultimately, the intention is to use this list to apply content accessibility work to specific contexts, file formats, and to add additional examples of best practices. In addition, changes will be made as new best practices emerge from the field.

# Publisher/Developer Best Practice Guidelines: Abbreviated List

***Goal 1: Users will be able to recognize and differentiate all aspects of content (perceivable)***

1. Content is presented in a flexible format that allows for customization/personalization based on user needs and preferences
2. Non-text elements have alternate text
3. Multimedia can be accessed through multiple modalities

***Goal 2: Users will be able to effectively use and interact with all aspects of content (operable)***

1. Location supports provide multiple ways to navigate, search, and determine progress
2. Content can be navigated with multiple devices
3. Time and pace does not interfere with the use of content
4. Interactive elements are accessible
5. Presentation does not cause seizures

***Goal 3: Users will be able to understand all aspects of content (understandable)***

1. Content is logical, appropriate, and consistent, and its presentation, progression, and organization is logical, predictable, and consistent
2. Supports and scaffolds are available for difficult or unfamiliar content
3. Auditory and visual feedback is provided

***Goal 4: Users will not be limited in how they access content and supporting materials (robust)***

1. Compatible with current and future tools, assistive technologies (AT), and platforms
2. All supporting materials comply with accessibility standards and best practices
3. Accurate and robust metadata is included

# Publisher/Developer Best Practice Guidelines: Expanded List

## Goal 1: Users will be able to recognize and differentiate all aspects of content (*perceivable*)

The way content is presented cannot be a barrier to learners’ ability to access that content. When considering the wide range of variability of potential users and various types of media and interactive features imbedded within learning materials, ensuring that all relevant or content-dependent aspects are perceivable can be quite complex. It requires content to be presented in formats that are flexible and that are accessible through multiple modalities.

### Content is presented in a flexible format that allows for customization/personalization based on user needs and preferences.

When creating a learning material, a single, static presentation of content will not be sufficient. Learners vary greatly, and a fixed pathway will not allow the majority of learners to successfully interact with, and ultimately learn from, such content. This requires creating materials in a flexible format. For example, in order for materials to be fully accessible, they must allow one learner to read text in 12-point font while another is able to read the same text in a 24-point font. It is also important that content is presented in a way that allows learners to control and to choose how they access it. Successful implementation of this guideline ensures that learners can perceive all aspects of the content in the way that is best for them.

#### Examples of elements for the implementation of this guideline include—

* Text size, font, contrast, color, spacing, and other visual elements are alterable
* Timing, rate, and volume of auditory elements are alterable
* Content is created to be reflowable
* Meaning is not reliant on access through a single modality
* Synchronized highlighting when text is voiced can be activated or deactivated
* All text can be read aloud by screen reading software, including at the word, sentence, paragraph, page, and section levels
* Stylesheets can be turned off or replaced with user-selected ones without interfering with meaning
* Background elements, pop-ups, and other potential interruptions can be turned off or minimized
* Redundant elements are identified and can be skipped
* Preferences/customizations can be saved

### Non-text elements have alternate text

Increasingly, digital materials contain many different non-text elements (graphics, icons, numbers, symbols, etc.). Adding these elements can help support learners’ understanding by showing multiple representations of content. However, non-text elements could also be a potential hindrance to learners who cannot access it through visual means. Without labeling these elements with long descriptions and/or alternate text that can be read aloud, these elements effectively remain invisible. For example, if a math formula is included as an image file, then complex formulas cannot be read aloud. Successful implementation of this guideline ensures that all learners will be able to benefit from non-text items.

#### Examples of elements for the implementation of this guideline include—

* Images, applets, plug-ins, scripts, and other elements are labeled with alternate descriptions
* Images and graphics are labeled with long descriptions when appropriate
* Buttons, icons, and other design and function elements are labeled with alternative text
* CAPTCHAs can be voiced
* Content within tables and charts is labeled
* MathML is used for all instructional mathematics content

### 

### Multimedia can be accessed through multiple modalities

Digital platforms not only allow for the integration of images and graphics into instructional content, but also allow content creators to incorporate other types of multimedia (audio clips, videos, simulations, animations, etc.) as well. A single type of media, however, will likely not be sufficient for all learners to fully understand the content and so is not a solution. Learners who have vision or hearing problems might not be able to access a particular modality without the inclusion of an alternate representation. For example, an audio clip without a transcript or a video clip without captions will be unperceivable to learners who cannot hear. Successful implementation of this guideline ensures that all learners are able to access multimedia.

#### Examples of elements for the implementation of this guideline include—

* Captions are provided for video content and other heard dialogue
* Text is available for audio content
* Audio description is provided for video content when appropriate
* Transcripts and/or sign language provided for audio content
* Alternatives are provided for media that relies on a single modality
* Real-time captions are provided for live presentations
* Alternatives are provided for time-based media
* Complex elements (animations, simulations, etc.) are accompanied by long descriptions

## 

## Goal 2: Users will be able to effectively use and interact with all aspects of content (*operable*)

As learning materials evolve to become dynamic presentations, learners not only need to be able to perceive and understand the content, they also need to be able to successfully navigate and interact with the content successfully. In order for this to happen, materials need to be created to support multiple ways for learners to navigate, search, determine their progress, and access interactive elements. Successful implementation of this guideline ensures that all users will be able to use and interact with the content successfully.

1. Location supports provide multiple ways to navigate, search, and determine progress

It is important that learning materials provide multiple ways for learners to navigate, search, and determine their progress. First, they should be able to navigate to and from different elements on a screen not only visually but also in non-visual ways. For example, when using a screenreader, learners should be able to skip repetitive content or jump from one heading to another. They should also be able to search for particular elements within the entire learning material or within a particular section. Finally, they should be able to determine where they are within the learning material. For example, elements such as clearly marked page numbers or a progress bar give learners a quick idea of where they are. Successful implementation of this guideline ensures that materials are structured to allow learners to easily navigate throughout and to determine their location within them.

#### Examples of elements for the implementation of this guideline include—

* Text documents are structured using styles such as titles, headings, and tables of contents
* Text-to-speech navigation is possible at the word, sentence, paragraph, page, and section levels
* Reading order is consistent, logical, and obvious
* Repetitive content can be easily skipped
* Tables and charts have rows and columns accurately labeled
* Lists are accurately labeled
* Functionality of links is made explicit (text of text links provides clear indication; screentips used where appropriate)
* Redundant links are specifically identified and can be skipped
* Alternatives (concept maps, graphic organizers, etc.) to text-dense content are available
* Non-visual navigation (such as via screenreader software) is supported
* Multi-touch gestures can be done with a single touch
* Location and progress of the user within the learning material is clearly indicated or discernible

1. Content can be navigated with multiple devices

It should be assumed that not all learners will navigate learning materials in the same way, yet full access to many learning materials is available via only one form of navigation. Some learners will be able to access materials using visual navigation on a standard computer. However, some learners will need to use a keyboard or other means to access materials. Successful implementation of this guideline ensures that all learners are able to navigate content successfully through whatever means works best for them.

#### Examples of elements for the implementation of this guideline include—

* Navigation with multiple assistive technologies (AT) and other tools is possible
* Elements can be navigated by use of a keyboard
* Elements can be navigated by use of a switch

1. Time and pace does not interfere with the use of content

Accounting for time and pace are factors that need to be considered when creating learning materials as there are a variety of ways learners could be hindered by non-alterable time limits and pacing. For example, some screen-displayed pages automatically refresh, and this might cause learners who access content through non-visual means to lose their place. Learners also need to be able to control the pace at which they progress through materials. For example, learners who might need to pause to take notes will not have full access to a video that cannot be paused and re-started. Successful implementation of this guideline ensures that learners will be able to take the time they need to use learning materials.

#### Examples of elements for the implementation of this guideline include—

* Time limits are alterable when appropriate for students
* Pausing, replaying, or fast forwarding is possible for moving and blinking content
* Videos, simulations, and other moving content can be slowed, paused, and re-started
* Screen pages do not automatically refresh
* Interruptions, alerts, and pop-ups presented during time-based activities can be stopped

1. Interactive elements are accessible

Digital learning materials have a great advantage in that they can be made interactive. This allows learners to access and engage with content as active learners. Some interactions include being able to fill out forms, answer questions, or push buttons, but interactivity also includes ensuring that learners have access to comment features and collaboration tools. Of course, to be accessible, these elements must be properly designed and labeled. Successful implementation of this guideline ensures that learners are able to interact with all aspects of curricular content.

#### Examples of elements for the implementation of this guideline include—

* Form fields are clearly labeled
* Question types and response types are clearly labeled
* Buttons are labeled and can be activated in multiple ways
* Warnings are given before important information is entered
* When content is changed, users receive notification
* Commenting and other collaborative features are available and accessible

1. Presentation does not cause seizures

Content that flashes and flickers at high speeds can cause seizures. Learning materials should be carefully created to avoid high-frequency flashing. Successful implementation of this guideline ensures that learners do not have seizures when viewing visual components of the content.

#### Examples of elements for the implementation of this guideline include—

* Content is designed to avoid screen flicker frequencies greater than 2Hz and lower than 55Hz
* No element flashes more than 3 times per second

## 

## Goal 3: Users will be able to understand all aspects of content (*understandable*)

Content needs to be more than *perceivable* and *operable*; it also needs to be *understandable*—that is, content should be created in intuitive, consistent, well-structured, and logical ways so as to lead to student learning. This requires careful consideration of how content is structured as well as how it is created (written, recorded, filmed, etc.). For example, the way content is written and organized for high school learners versus elementary learners will be quite different.

1. Content is logical, appropriate, and consistent; and its presentation, progression, and organization is logical, predictable, and consistent

How content is organized greatly influences whether or not learners will be able to understand it. For example, if each chapter of a digital book is organized in a different way and has different features, then learners will have to learn how to interact with each chapter before they can really focus on its content. This causes unnecessary delays for learners, particularly learners with disabilities. Of course, content should not only be organized in a logical manner, it should also be written in a way that is appropriate for the intended learner population. For example, writing that is appropriate for a high school science textbook would not be appropriate for content intended for elementary learners. Successful implementation of this guideline ensures that all learners can understand the majority of the content without additional scaffolds and supports.

#### Examples of elements for the implementation of this guideline include—

* Linguistic supports are made available where appropriate for students (spelling checkers, grammar checkers, word prediction software, glossaries, etc.)
* Reading order is predictable
* Reading level is identified and is appropriate to the target audience
* Goals are relevant and clearly available to learners
* Structure (headings, columns, etc.) is consistently labeled throughout the design
* Content is divided into logical sections when appropriate
* Information about how links operate is provided
* Users are notified when context changes or will change
* Main ideas/key details can be highlighted
* Excessive wordiness is avoided
* Content is authored according to standard conventions (of grammar, usage, etc.)
* Unnecessary design elements are eliminated

1. Supports and scaffolds are available for difficult or unfamiliar content

When creating accessible materials one cannot assume that all learners will have the same level of knowledge, skills, and beliefs when interacting with content. Yet many times learning materials do not provide adequate supports and scaffolds to account for this variability. For example, a student who is learning English might not understand a particular word used in a lesson, and without immediate support they might not be able to understand the content. Elements like glossaries, concept maps, and rubrics can help by giving learners just-in-time supports and guiding them in learning the content. Successful implementation of this guideline ensures that all learners have an equal opportunity to learn the content despite varying levels of knowledge, skills, and abilities.

#### Examples of elements for the implementation of this guideline include—

* Abbreviations and acronyms are explained and can be expanded
* Organizational supports are made available (graphic organizers, checklists, concept maps, word webs, guides, reminders, etc.)
* Key elements can be highlighted or emphasized
* Information can be divided into smaller units
* Models and mentors are available
* Rubrics and sample work are available for assessments
* Reflaection / self assessment points are included for learners to validate their understanding
* Social supports (teacher–learner, peer–peer) are available to be accessed
* Pronunciations and diacritical mark-up is provided for difficult, newly-introduced, or content-critical words
* Translations are provided/supported when appropriate
* Summaries are provided at the end of complex points

1. Auditory and visual feedback is provided

Providing students with timely and accurate feedback in multiple modalities is important when creating accessible materials. Even the most adroit learner will make errors when using a learning material and will inevitably need help. For example, they might click on the wrong area or enter incorrect information into a form. When this occurs, messages should be quickly displayed in multiple modalities so all learners can recognize their error and can correct the problem. When an error message is not enough, more explicit instructions or help should be available to learners. Successful implementation of this guideline ensures that learner errors not related to a lesson are quickly corrected and learners receive the help they need.

#### Examples of elements for the implementation of this guideline include—

* Feedback is given promptly and is specific
* Errors and warning messages are provided in multiple formats when a user makes a mistake
* Instructions are provided for items to be completed
* Help is available when needed

## Goal 4: Users will not be limited in how they access content and supporting materials (robust)

Unfortunately, even when materials are made perceivable, operable, and understandable, it will not always be practical, or ideal, to build in every feature that a user might need. For example, it would not be practical in many cases to build in a special switch for learners with severe motor impairments. Additionally, it often might be impractical for a learner to need to learn features that are similar, but specific (i.e., with differences), to each learning material. For example, the accessibility features using an Android operating system or an Apple operating system function differently, so students would need practice using each of these before they could easily use them independently. In such cases, what is most important is that the materials are flexible enough to allow learners to continue to access content through assistive technologies and other technology regardless of platform or other features. Further, to create a truly robust accessible learning material, all supporting materials should be accessible, metadata should be provided, and materials must be tested in order to be fully accessible.

1. Compatible with current and future tools, assistive technologies (AT), and platforms

There will inevitably be many different devices being used in schools and districts, and content needs to be compatible with these different types of devices. For instance, a learner on a tablet computer and a learner on a desktop computer should both be able to perceive and to interact with all the elements of the content. Devices that might be used also extend beyond mainstream technologies. Some learners will need to access content with specialized

technologies called assistive technologies (AT), and these must also be compatible. Successful implementation of this guideline ensures that no matter what device learners choose to use all learners will have access to learning materials.

#### Examples of elements for the implementation of this guideline include—

* Access to content is device agnostic or platform neutral
* Content can be accessed using AT (screen readers, screen magnification, text-to-speech software, etc.)
* Digital rights management (DRM) does not interfere with use by AT
* Mark-up is valid and tested with multiple tools and browsers as necessary

1. All supporting materials comply with accessibility standards and best practices

Many learning materials are developed with supporting or supplementary materials. For example, a digital book might link to a web page that provides additional content, or there may be workbook-style applications or assessments included to help check learners’ understanding. Though these types of materials can greatly aid both teachers and learners to use and to comprehend the content, when they are not accessible, learners and teachers cannot benefit from them. It is important when creating or linking to materials outside of the primary content to ensure that these materials also comply with standards and best practices. Successful implementation of this guideline ensures that all learners can benefit from all aspects of the learning materials.

#### Examples of elements for the implementation of this guideline include—

* Any supplemental materials are compliant with accessibility standards and best practices
* Additional documents (word, pdf, etc.), both publisher and non-publisher created, are made with best practices according to their specific file type
* External resources (research databases, library resources, etc.) are accessible or clearly identified as inaccessible
* Accessible alternatives are identified for inaccessible materials
* Product is tested for accessibility including by individuals with disabilities

1. Accurate and robust metadata is included

Though not of direct benefit to learners, metadata is important to include when developing accessible learning materials. Successful implementation of this guideline ensures that purchasers and learners can access key accessibility information.

#### Examples of elements for the implementation of this guideline include—

* Standards-compliant metadata is provided to support the accurate discovery and categorization of accessible instructional content

# Resources

## Accessibility Best Practice Lists and Checklists

| ***Organization*** | ***Publication*** | ***Link*** |
| --- | --- | --- |
| AccessIT | Information Technology in Education Accessibility Checklist | <http://www.washington.edu/accessit/it-checklist/> |
| Apple | Apple Accessibility | <http://www.apple.com/accessibility/> |
| BBC | Future Media Standards and Guidelines | <http://www.bbc.co.uk/guidelines/futuremedia/accessibility/> |
| Blog Accessibility | Accessibility Checklist for Blog Posts | <http://blogaccessibility.com/accessibility-checklist-for-blog-posts/> |
| CATEA: Grade Project | Guidelines for Accessible Distance Education | <http://www.catea.gatech.edu/grade/guides/introduction.php> |
| Developer.Android | Accessibility Developer Checklist | <http://developer.android.com/guide/topics/ui/accessibility/checklist.html> |
| EDI*t*EUR | Accessible Publishing: Best Practice Guidelines for Publishing | <http://www.editeur.org/files/Collaborations/Accessibility/WIPO.html#how_to_conduct_an_accessibility_audit> |
| George Mason University: Assistive Technology Initiative Office | Accessibility Resource for Web Page and Web Application Checklist | <http://accessibility.gmu.edu/webaccessibility/docs/Appendix%20B%20-%20accessibility%20checklist.pdf> |
| Humbolt State University | HSU Checkpoints Explained | <http://www.humboldt.edu/wag/education/explained.html> |
| IBM | Web Checklist | <http://www-03.ibm.com/able/guidelines/web/accessweb.html> |
| IBM | Software Checklist | <http://www-03.ibm.com/able/guidelines/software/accesssoftware.html> |

| ***Organization*** | ***Publication*** | ***Link*** |
| --- | --- | --- |
| IBM | Lotus Notes Checklist | <http://www-03.ibm.com/able/guidelines/notes/accessr5.html> |
| IBM | Documentation Checklist | <http://www-03.ibm.com/able/guidelines/documentation/accessdoc.html> |
| Illinois Department of Human Services: Illinois Information Technology Accessibility Act | Website Accessibility Quick Test Checklist | <http://www.dhs.state.il.us/iitaa/webaccessibilityquicktestchecklist.html> |
| Inclusive Design Research Centre | Best Practices | <http://idrc.ocad.ca/index.php/resources/idrc-online/library-of-papers/inclusive-design/best-practices> |
| Kansas State: Information Technology | Web Accessibility for K-State Websites | <http://www.k-state.edu/tools/access/checklist.html> |
| MIT Assistive Technology Information Center | General Web Accessibility Guidelines | <http://web.mit.edu/atic/www/accessibility/guidelines.html> |
| Mobile Manufacturers Forum (MMF) | Mobile Accessibility | <http://www.mobileaccessibility.info/index.cfm?lang=eng> |
| NetMechanic | Accessibility Tip Accessibility Checklist | <http://www.netmechanic.com/news/vol7/accessibility_no8.htm> |
| PALM Initiative | What are accessible learning materials—Indicators of accessibility | <http://aim.cast.org/learn/practice/palm> |
| Penn State: AccessABILITY | Accessibility Checklist | <http://accessibility.psu.edu/checklist> |
| Portland Community College | Accessibility Checklist for Web Content and Online Courses: A Self-Assessment Tool | <http://www.pcc.edu/resources/instructional-support/access/documents/access-checklist.pdf> |

| ***Organization*** | ***Publication*** | ***Link*** |
| --- | --- | --- |
| Postsecondary Commission on Accessible Instructional Materials | Draft accessibility specifications list (within downloadable report at URL listed) | <http://aim.cast.org/collaborate/p-s_commission> |
| Rhode Island Government | Accessibility Checklist | <http://www.ri.gov/policies/access_checklist.php> |
| RNIB | See It Right: web site Accessibility Audit | <http://www.rnib.org.uk/professionals/webaccessibility/planning/Pages/checklists.aspx> |
| Stephen F. Austin State University | Accessibility Checklist | <http://www.sfasu.edu/web-dev/100.asp> |
| Texas Virtual School Network | TxVSN: Accessibility Guidelines | <http://www.txvsn.org/portal/Portals/0/providers/Accessibility/TxVSN_Guidelines.pdf> |
| U.S. Social Security Administration | SSA Accessibility Best Practice Library | <http://www.ssa.gov/accessibility/bpl/default.htm> |
| University of Illinois at Urbana/Champaign: Campus Information Technologies and Educational Services (CITES) and Disability Resources and Educational Services (DRES) | Web Accessibility Best Practices | <http://cita.disability.uiuc.edu/html-best-practices/index.php> |
| University of Texas at Austin | Web Accessibility Checklist | <http://www.utexas.edu/learn/accessibility/testing.html> |
| University of Utah: Web Master Resources | Principles of Accessibility | <http://web.utah.edu/uwebresources/accessibleu/pour.html> |
| WAI | How people with disabilities use the web—Accessibility principles | <http://www.w3.org/WAI/intro/people-use-web/principles.html> |
| WAI | Mobile Accessibility | <http://www.w3.org/WAI/mobile/> |
| WAI | How people with disabilities use the web—Diversity of web users | <http://www.w3.org/WAI/intro/people-use-web/diversity> |

| ***Organization*** | ***Publication*** | ***Link*** |
| --- | --- | --- |
| WAI | Shared Web Experiences: Barriers Common to Mobile Device Users and People with Disabilities | <http://www.w3.org/WAI/mobile/experiences> |
| Webaccessibility.com | Best Practices—Web | <https://www.webaccessibility.com/best_practices.php> |
| WebAIM | Quick reference: Accessibility Principles | <http://webaim.org/resources/quickref/> |
| WebAIM | WCAG 2.0 Checklist | <http://webaim.org/standards/wcag/checklist> |
| WebAIM | Section 508 Checklist | <http://webaim.org/standards/508/checklist> |
| West Virginia University: Brand Center | Accessibility Checklist | <http://brand.wvu.edu/accessibility_checklist> |

## Standards and Standards Mapping Links

| ***Organization*** | ***Publication*** | ***Link*** |
| --- | --- | --- |
| IBM | Web Checklist | <http://www-03.ibm.com/able/guidelines/web/ibm508wcag.html> |
| Section508.gov | Section 508 | <http://www.section508.gov/> |
| Tom Jewett Web Design | Mapping Section 508 to WCAG 2.0 | <http://www.tomjewett.com/accessibility/508-WCAG2.html> |
| W3C | WCAG 2.0 | <http://www.w3.org/WAI/intro/wcag.php> |
| W3C | MathML | <http://www.w3.org/Math/> |
| WAI | Policies relating to web accessibility | <http://www.w3.org/WAI/Policy/> |
| WAI | Why standards harmonization is essential to web accessibility? | <http://www.w3.org/WAI/Policy/harmon.html> |

## Glossary

**ADA** **(Americans with Disabilities Act)**

The ADA is a law that was enacted by the U.S. Congress in 1990. It was later amended in 2009. The ADA prohibits discrimination based on disability. Disability is defined by the Act as “physical or mental impairment that substantially limits a major life activity.” The Act covers areas of civil life such as employment, education, transportation, public and commercial facilities, and telecommunications. Part of the Act decrees that individuals who exercise their rights under the ADA may not be subject to retaliation or coercion.

**AIM (Accessible Instructional Materials)**

Accessible instructional materials, or AIM, are materials that are designed or converted in a way that makes them usable across the widest range of student variability regardless of format (print, digital, graphic, audio, video). IDEA (the Individuals with Disabilities Education Act) specifically focuses on accessible formats of print instructional materials. In relation to IDEA the term AIM refers to print instructional materials that have been transformed into the specialized formats of braille, large print, audio, or digital text.

**AIM Center**

The mission of the National Center for Accessible Instructional Materials (AIM) is to improve educational opportunities for the estimated four percent (4%) of the elementary and secondary student population that experiences print disabilities. The overall goal of the AIM Center is to assist state educational agencies, local education agencies, and other stakeholders with 1) improving the implementation of NIMAS, and 2) developing and implementing unified distribution systems in SEAs that will improve the selection and timely delivery of high-quality accessible instructional materials (AIM) to all children with disabilities who need print-based instructional materials in accessible formats. The intent of the AIM Center is that every student with a print-related disability will be identified and provided with the specialized formats and tools necessary to participate fully in the learning process with the result of improved engagement and educational outcomes.

**applet**

An applet is a small application that runs from within a larger one in order to process a specific function or set of functions or to complete a specific task or set of tasks. Since applets do not run from operating systems, they are usually compatible across a variety of systems.

**AT (assistive technology)**

AT is a collective term for any software, hardware, device, or tool that is designed and produced, or modified and customized, to “improve functional capabilities of individuals with disabilities” (29 U.S.C. Sec 2202(2)). Examples of AT include screenreader software, magnification devices, ramps, hearing aids, augmentative communication devices.

**AT Act 1998**

The Assistive Technology Act was first enacted as the Technology-Related Assistance Act of 1988. It has been re-authorized in 1994, 1998, and 2004. As described by NICHY, the AT Act is “intended to promote people’s awareness of, and access to, assistive technology (AT) devices and services. The Act seeks to provide AT to persons with disabilities, so they can more fully participate in education, employment, and daily activities on a level playing field with other members of their communities. The Act covers people with disabilities of all ages, all disabilities, in all environments (early intervention, K-12, post-secondary, vocational rehabilitation, community living, aging services, etc.) [National Dissemination Center for Children with Disabilities, <http://nichcy.org/>].

**CAPTCHA**

“A captcha is program used to verify that a human, rather than a computer, is entering data. Captchas are commonly seen at the end of online forms and ask the user to enter text from a distorted image. The text in the image may be wavy, have lines through it, or may be highly irregular, making it nearly impossible for an automated program to recognize it. (Of course, some captchas are so distorted that they can be difficult for humans to recognize as well.) Fortunately, most captchas allow the user to regenerate the image if the text is too difficult to read” (techTerms.com, <http://www.techterms.com/definition/captcha>). In recent years, an auditory pronunciation feature is available for entering information.

**DAISY (Digital Accessible Information SYstem)**

DAISY refers to a technical standard for producing accessible and navigable multimedia documents. In current practice, these documents are Digital Talking Books (DTBs), digital text books, or a combination of synchronized audio and text books.

**DAISY Consortium**

The DAISY Consortium was formed for the purpose of establishing the International Standard for the production, exchange, and use of the next generation of Digital Talking Books (DTBs). The DAISY Consortium is made up of organizations throughout the world who serve persons who are blind or print-disabled. The object of the DAISY Consortium is to improve access to all kinds of information for blind and print-disabled people (<http://www.daisy.org>).

**device agnostic**

“Not tied to a particular device. Same as ‘machine independent.’ The term generally refers to software that runs on multiple platforms such as a Java application. It also refers to web sites that are as readable in mobile devices as they are on desktop computers” (PC Magazine Encyclopedia, <http://www.pcmag.com/encyclopedia/term/63798/device-agnostic>).

**diacritical mark-up**

Diacritical mark-up is adding or attaching a mark, sign, or symbol to a letter or character to give it a particular phonetic value, to indicate stress, etc., such as a tilde or an accent aigu. For example, the use of an accent over the last letter of the word café changes how it is spoken aloud.

### DRM (Digital Rights Management)

Digital rights management systems are authorizing technologies implemented by rights holders and/or publishers to limit the distribution and use of proprietary content. Examples of DRM systems are encryption (securing content as a locked file requiring a hardware or software-based "key" for unlocking), watermarking (the embedding of identifying information on digital files), fingerprinting (the association of specific user data with a particular file or collection of files). DRM systems can employ one or more of these approaches.

**ELL (English Language Learner)**

An English language learner is a person who is in the process of acquiring English and speaks another language as their native or first language.

**ePUB**

ePUB is a digital format based on HTML. It is free and open source, yet allows DRM to be incorporated; it is designed to be reflowable; and supports the use of XML, CSS, image files, audio, and video.

**Hertz (Hz)**

The Hertz is a unit of frequency expressing the number of cycles per second. This unit is used in measurements or specifications of frequencies in computer processing, radiation, radio waves, sound waves, vibration etc.

**ICT products and services**

ICT stands for “information and communication technologies” and includes technology-based products such as office machinery, equipment, and supplies; computer equipment and supplies including data processing machines, screens, consoles, and peripheral equipment; radio, television, communication, telecommunication, and related equipment and apparatus. (For more detailed information, see the PDF document entitled Human Factors [HF]; European accessibility requirements for public procurement of products and services in the ICT domain [European Commission Mandate M 376, Phase 1] <http://www.mandate376.eu/doc/tr_102612v010101p.pdf>.)

**IDEA (Individuals with Disabilities Education Act)**

Most recently reauthorized as the Individuals with Disabilities Education Improvement Act in 2004, IDEA is a federal law governing the rights of children with disabilities to receive a free and appropriate public education (FAPE) in what is termed a least restrictive environment (LRE) (<http://www.ed.gov/policy/speced/guid/idea/idea2004.html>).

**IDPF (International Digital Publishing Forum)**

The International Digital Publishing Forum (IDPF), formerly known as OeBps, is a trade and standards organization dedicated to the development and promotion of electronic publishing (<http://www.idpf.org>).

**M376 Mandate**

M376 Mandate is a short way to refer to the law entitled European Accessibility Requirements for Public Procurement of Products and Services in the ICT Domain. “European Commission (EC) Mandate M 376 requires the three European standards organisations [CEN](http://www.cen.eu/), [CENELEC](http://www.cenelec.eu/) and [ETSI](http://www.etsi.org/) to harmonise and facilitate the public procurement of accessible information and communication technologies (ICT) products and services within Europe. They will identify a set of functional accessibility requirements for public procurement, and then develop an on-line toolkit through which public procurers can access these requirements in a structured way as part of the normal procurement process” (<http://www.mandate376.eu/>).

**MathML (Mathematical Mark-Up Language)**

An XML-based language used to display mathematical content.

### metadata

Metadata is information that refers to one or more other pieces of information that can exist as separate physical forms (data about data). Any description can be considered metadata. Examples include library catalog information, encoded text file headers, and driver's license data. In the information technology world the term is often used to indicate data which refers to digital resources available across a network.

**NCAIM**

NCAIM stands for The National Center on Accessible Instructional Materials. See AIM Center.

***operable***

In the context of this document, *operable* is used as defined in WCAG 2.0 Guidelines, meaning “user interface components and navigation must be operable”—i.e., useable; utilizable (<http://www.w3.org/TR/WCAG/#operable>).

**PALM Initiative**

The National Center on Accessible Instructional Materials has launched the PALM Initiative (Purchase Accessible Learning Materials) to address the concern that if digital materials and the technology used to deliver and interact with digital content are not designed to be usable by all students from the start, many students risk being left behind. The PALM Initiative encourages purchasers to demand and publishers and other producers to create accessible learning materials.

***perceivable***

In the context of this document, *perceivable* is used as defined in WCAG 2.0 Guidelines, meaning “information and user interface components must be presentable to users in ways they can perceive” (<http://www.w3.org/TR/WCAG/#perceivable>).

**platform neutral**

Platform neutral refers to content that has been created in such a way that it can be used across a variety of delivery formats, such as print, online, television, radio, etc.

**plug-in**

A plug-in is a small application that is added to a larger application in order to allow it to perform a specific, additional function that the plug-in provides. For example, one of the most popular plug-ins at the time of this writing is Adobe’s Flash Player software for viewing video and audio content via a browser.

**reflowable**

Reflowable refers to digital content that has been designed in such a way that words wrap to the next line, paragraphs wrap to the next page, and so on, according to user action in changing the size of the display.

***robust***

In the context of this document, *robust* is used as defined in WCAG 2.0 Guidelines, meaning “content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies” (<http://www.w3.org/TR/WCAG/#robust>).

**rubric**

A rubric is an aide to grading assignments or assessing results of study by assigning a lesson’s or a project’s criteria and describing levels of performance from poor to excellent in terms of objectives achieved and/or numbering system. For example, a simple rubric may address understanding of one concept, with 1 = familiar with term only, 2 = basic understanding, 3 = full understanding, 4 = mastery (able to teach or explain concept to others). Certain kinds of rubrics can help students learn by clarifying the purpose of a lesson and its learning goal.

**screenreader**

A screenreader is an application that voices a variety of content formats via text-to-speech. Users can employ a screenreader application in order to listen to audio versions of text documents, web site pages, etc.

**Section 504**

Section 504 prohibits discrimination against qualified individuals with disabilities. Section 504 regulations require a school district to provide a free appropriate public education (FAPE) to each qualified student with a disability, regardless of the nature or severity of the disability.

**Section 508**

Section 508 requires that all federal agency web site content be equally accessible to people with disabilities. It applies to web applications, web pages, and all attached files. It applies to internal networks as well as public web sites.

**stylesheet**

A stylesheet is used when it is important, or simply a good idea, to keep content and its presentation separate. A stylesheet includes information for display and formatting such as fonts, italics, background images, margins, page breaks, etc.

**switch**

As used in the AT industry, a switch refers to a device that supplies “an interface between person [and] machine which provides control of equipment and programs” when traditional methods of use are not suitable (<http://www.customtyping.com/tutorials/at/switches/what.htm>).

### UDL (Universal Design for Learning)

UDL is a theory of learning and teaching based on neuroanatomy and functional neuroimaging research techniques. UDL posits that teachers, educators, and instructional materials should effectively respond to individual differences inherent within a learning environment. Across learning goals, methods, materials, and assessments, UDL encourages offering multiple means of representation to give learners various ways of acquiring information and knowledge, multiple means of expression to provide learners alternatives for demonstrating what they know, and multiple means of engagement to tap into learners' interests, challenge them appropriately, and motivate them to learn (<http://www.cast.org/research/udl/index.html>).

**WAI (Web Accessibility Initiative)**

WAI provides “strategies, guidelines, [and] resources to make the web accessible to people with disabilities” (W3C WAI, <http://www.w3.org/WAI/>).

**WCAG 2.0 (Web Content Accessibility Guidelines)**

“WCAG 2.0 covers a wide range of recommendations for making web content more accessible. Following these guidelines will make content accessible to a wider range of people with disabilities, including blindness and low vision, deafness and hearing loss, learning disabilities, cognitive limitations, limited movement, speech disabilities, photosensitivity and combinations of these. Following these guidelines will also often make your web content more usable to users in general” (W3C WCAG, <http://www.w3.org/TR/WCAG/>).