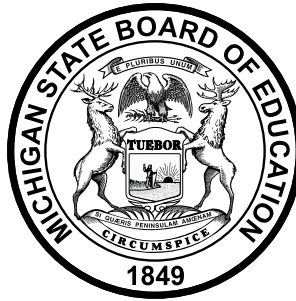




Michigan Assistive Technology Guidelines for Teachers of Students Who Are Blind or Visually Impaired

Pre-Kindergarten - Kindergarten



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Introduction

The *Michigan Assistive Technology Guidelines for Teachers of the Blind and Visually Impaired* is an expanded document to specifically guide teachers of students who are Blind or Visually Impaired (BVI) in pre-kindergarten through grade 12 with assistive technology (AT). This guide is based on the International Society for Technology in Education (ISTE) Standards to which the Michigan Integrated Technology Competencies for Students (MITECS) connects.

These guidelines follow six key concepts:

- Technology Operations and Concepts
- Creativity and Innovation
- Communication and Collaboration
- Critical Thinking and Problem Solving
- Research and Information Technology
- Digital Citizenship

Appendix:

- Assistive Technology Glossary
- Assistive Technology Resources
- Assistive Technology Tools and Applications Sample Listing
- Assistive Technology Tools Record Keeping Chart

Assistive Technology Guidelines Protocol

- Use the guidelines to help develop specific individualized education program (IEP) goals.
- An AT Glossary, AT Resources, AT Tools, and AT Tools Table can be found after each grade-level guideline.
- Use the key below to track student progress.

Student Progress Key

A = Formal Assessment

O = Teacher Observation

P = Portfolio Evidence

C = 21st Century Technology Class

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I. Technology Operations and Concepts: Pre-Kindergarten - Kindergarten

Awareness, exploration, and opportunities to use 21st-century digital tools.

Student Progress Key

A = Formal Assessment

O = Teacher Observation

P = Portfolio Evidence

C = 21st Century Technology Class

Student Details

Student Name:

Teacher Name:

School:

#	Skill (To Be Completed by the End of Kindergarten)	Suggested Teacher Activities to Aid the Student	Key	Grade	Date Achieved	Notes/ Equipment
1	Demonstrate an understanding that people use many types of digital/ electronic tools in their daily lives.	<ul style="list-style-type: none"> Introduce a variety of digital/electronic tools, such as cameras, computers, audio/ video equipment, digital/player readers, drawing tools, touch screen tablets, audio/ video recording devices, personal digital assistants (PDAs), SMART Braille, and braille displays. 				
2	Use basic terminology to identify and describe the components of a system.	<ul style="list-style-type: none"> Introduce assistive technology device (ATD) terminology and use appropriate terminology for digital/ electronic tools, such as cameras, computers, audio/ video equipment, digital/player readers, drawing tools, touch screen tablets, audio/ video recording devices, personal digital assistants (PDAs), SMART Braille, braille displays, and any adaptive devices such as switches. 				
3	Explore and use the keyboard and perform basic operations with teacher-guided assistance using ATDs and any required adaptive devices such as switches.	<ul style="list-style-type: none"> Explore the keyboard, mouse, joystick, tablet, or other adaptive devices, using age-appropriate programs such as Learn Keys (American Printing House for the Blind), Kid Keys (Knowledge Adventure), cause-and-effect software (mouse/switch), Android/iOS apps, or similar types of ATDs when necessary. 				

#	Skill (To Be Completed by the End of Kindergarten)	Suggested Teacher Activities to Aid the Student	Key	Grade	Date Achieved	Notes/ Equipment
4	Demonstrate the safe operation and proper care of a technological system.	<ul style="list-style-type: none"> Introduce, discuss, and demonstrate appropriate care, use, and personal hygiene when using digital/electronic tools, including ATDs and any adaptive devices. 				
5	Explore and experience the use of ATDs, such as magnification software, apps, braille, braille displays, large print, text-to-speech, scanners, screen readers, electronic reference applications, speech output, adaptive switches, communication boards, digital/ Daisy players/recorders, and/ or augmentative communication devices.	<ul style="list-style-type: none"> Begin to introduce, discuss, demonstrate, and use a variety of ATDs, such as magnification software, apps, braille, braille displays, large print, text-to-speech, scanners, screen readers, electronic reference applications, speech output, adaptive switches, communication boards, digital/Daisy players/recorders, and/or augmentative communication devices. 				
6	Demonstrate the proper ergonomic body position and use of a keyboard, a mouse, touch screen tablet, ATDs, and adaptive devices, specific to the student's needs.	<ul style="list-style-type: none"> Demonstrate, guide, and provide a variety of opportunities to explore and experience the various forms of navigation of ATDs, adaptive devices, touch screen tablets, and computers. 				



II. Creativity and Innovation: Pre-Kindergarten - Kindergarten

Designing and creating meaningful products is enhanced and extended through the use of technology.

Student Progress Key

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C = 21st Century Technology Class

Student Details

Student Name:

Teacher Name:

School:

#	Skill (To Be Completed by the End of Kindergarten)	Suggested Teacher Activities to Aid the Student	Key	Grade	Date Achieved	Notes/ Equipment
1	Use a variety of digital/electronic tools to explore, learn, create, and convey original ideas or illustrate simple concepts.	<ul style="list-style-type: none"> Introduce, model, and demonstrate (with hands-on experiences utilizing ATDs, incorporating adaptive devices when necessary) that digital/electronic tools can gather information, illustrate simple ideas, complete activities, and be useful for collaboration on projects. For example, create an "All About Me" interactive storybook using images and text. Allow the student to explore and choose multimedia and tactile formats to cultivate creative expression. 				



III. Communication and Collaboration: Pre-Kindergarten - Kindergarten

Communication is enhanced and extended through the use of technology.

Student Progress Key

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Student Details

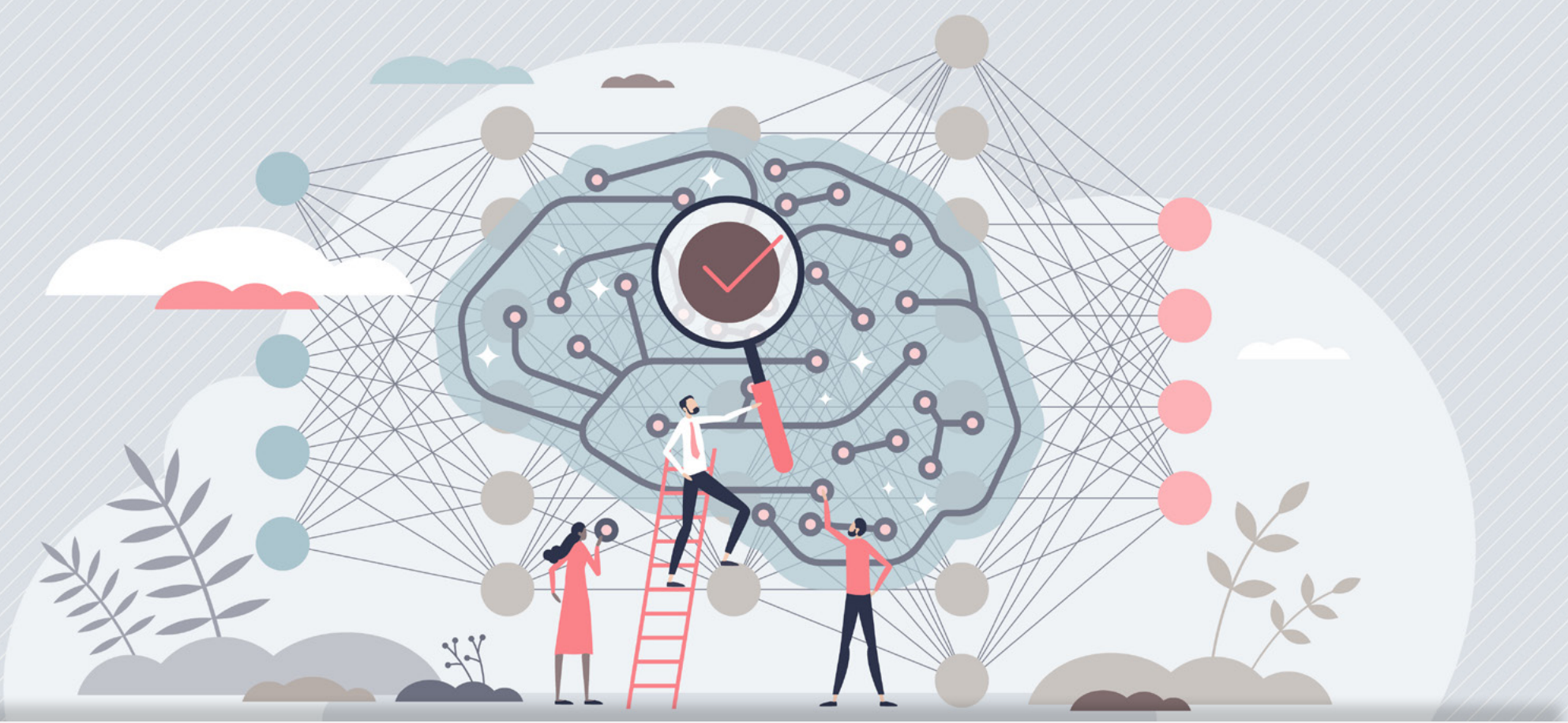
Student Name:

Teacher Name:

School:

#	Skill (To Be Completed by the End of Kindergarten)	Suggested Teacher Activities to Aid the Student	Key	Grade	Date Achieved	Notes/ Equipment
1	Use a variety of developmentally age-appropriate digital/electronic tools to communicate ideas to classmates, family members, and others.	<ul style="list-style-type: none"> Introduce, demonstrate, and allow practice producing audio recordings, braille, tactile graphics, text-to-speech output, screen reading, magnification (large print), and using appropriate ATDs while incorporating any required adaptive devices. 				
2	Be exposed to “smart” devices and systems such as phones, video chat, speakers/voice controlled systems, and email as forms of communication and leisure/ recreation.	<ul style="list-style-type: none"> Support observation of parent and teacher initiating, receiving, and/or responding to a phone call, email, text message, or voice command to a voice-controlled system using ATDs (including adaptive devices) when necessary. For example, participating along with parent or teacher using video chat such as FaceTime, sending a greeting, photograph, audio card, or video. 				

#	Skill (To Be Completed by the End of Kindergarten)	Suggested Teacher Activities to Aid the Student	Key	Grade	Date Achieved	Notes/ Equipment
3	Be exposed to keyboard input onto a text document or programs with a text component.	<ul style="list-style-type: none"> Support practice using keyboard letters/ numbers, utilizing age-appropriate interactive programs implementing ATDs (including adaptive devices) specific to the student's needs, incorporating any adaptive devices necessary. Explore and demonstrate pre-word processing skills using ATDs and incorporating any adaptive devices, such as switches, to emphasize picture/text placement in a document as well as "save" and "print" actions. 				
4	Understand and demonstrate how to log in, create, save, and print using appropriate ATDs, a computer, or a touch-screen tablet, incorporating any required adaptive devices.	<ul style="list-style-type: none"> Demonstrate and provide opportunities to log in, create, save and print with ATDs (utilizing any required adaptive devices), a computer, or a touch-screen tablet by using appropriate commands, icons, buttons/keys or finger gestures, and audio cues. 				



IV. Critical Thinking, Problem Solving, and Decision Making: Pre-Kindergarten - Kindergarten

Thinking skills are enhanced or strengthened through the use of technology.

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Student Details

Student Name:

Teacher Name:

School:

#	Skill (To Be Completed by the End of Kindergarten)	Suggested Teacher Activities to Aid the Student	Key	Grade	Date Achieved	Notes/ Equipment
1	Be exposed to, become aware of, and use a variety of age-appropriate digital/electronic devices, software, and apps to develop critical thinking and reasoning skills.	<ul style="list-style-type: none"> Support and guide the use of problem-solving methods through the use of digital/ electronic devices, software, and apps using ATDs (utilizing any required adaptive devices). 				
2	Introduce and explore pre-coding and coding concepts through block-based coding activities that integrate critical thinking and problem solving skills.	<ul style="list-style-type: none"> Introduce and explore hands-on, block-based coding games that expose students to algorithms, sequencing, directionality, loops, branches, and debugging. For example, treasure hunts (algorithms), story sequencing and patterns (sequence), mazes (directionality), daily routines (looping), variations of daily routines and cause-and-effect activities (branch), and persistence through troubleshooting activities to problem-solve (debugging). Hour of Code's "pre-reader" game section also includes all skills. Use any ATDs or adapted devices as required or needed. 				



V. Research and Information Literacy: Pre-Kindergarten - Kindergarten

Awareness, exploration, and opportunities to experience the internet and digital resources.

Student Progress Key

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C = 21st Century Technology Class

Student Details

Student Name:

Teacher Name:

School:

#	Skill (To Be Completed by the End of Kindergarten)	Suggested Teacher Activities to Aid the Student	Key	Grade	Date Achieved	Notes/ Equipment
1	Explore and experience the internet.	<ul style="list-style-type: none"> Support, with demonstration and practice, the use of age-appropriate websites such as ABCya!, National Geographic Kids, Scholastic, Fun Brain, Starfall, PBS Kids, Magic School Bus, Learning Planet, and other interactive sites with ATDs (utilizing any required adaptive devices). 				



VI. Digital Citizenship: Pre-Kindergarten - Kindergarten

The ethical use of technology is an essential element of responsible citizenship.

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Student Details

Student Name:

Teacher Name:

School:

#	Skill (To Be Completed by the End of Kindergarten)	Suggested Teacher Activities to Aid the Student	Key	Grade	Date Achieved	Notes/ Equipment
1	Introduce the Michigan Cyber Initiative's three rules (Keep Safe, Keep Away, Keep Telling) and discuss for understanding.	<ul style="list-style-type: none"> Support the introduction of the Michigan Cyber Initiative's three rules (Keep Safe, Keep Away, Keep Telling). 				
2	Demonstrate an understanding of appropriate and inappropriate uses of technology at school and home, and describe the consequences of inappropriate uses, including all ATDs and adaptive devices.	<ul style="list-style-type: none"> Support the introduction of classroom, school, and district technology policies and procedures with parents/caregivers and students for using technology, including ATDs (and any required adaptive devices), and the consequences of inappropriate use. 				

Assistive Technology Glossary

ASCII (American Standard Code for Information Interchange):

Pronounced “ask-ee,” it is the built-in binary code for representing characters in all computers except IBM mainframes, which use the EBCDIC coding system. A standard coding scheme specifically oriented toward data processing applications, ASCII was developed in 1963 and modified in 1967 by the American National Standards Institute (ANSI).

App:

App is short for “application.” App software can be downloaded from the internet onto smartphones, tablets, computers, or other digital and electronic devices.

Assistive Technology Device:

An assistive technology device, as defined by IDEA, is any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of children with disabilities (20 U.S.C. 1401(1)).

Audio File:

A file containing compressed digital audio that may be found in various formats, such as a compact disc, MP3, or other ATD.

Avatar:

A graphical representation of the user, or an alter ego of the user.

AVI:

AVI stands for Audio Video Interleave. It is a multimedia format that was introduced by Microsoft in 1992. AVI files contain both audio and video.

Block-Based Coding Programming:

Block-based coding is used as an introduction to coding and incorporates “blocks” of instructions. The blocks instruct the moves and can be arrows for direction, colors, and actions. The student drags the blocks to the instructions to complete tasks.

Blog:

Blog is short for “weblog.” Someone who blogs is called a “blogger.” A blog is a website where a blogger maintains a personal journal or interactive forum, much like a public discussion board. Written by one person or a group of contributors, entries contain commentary and links to other websites as well as images and videos. The term “blog” is used as both a noun and verb.

Bluetooth:

Bluetooth is a short-range wireless technology used to create Personal Area Networks (PANs) among an individual’s devices, and with other nearby devices. Note: Check electronic/digital devices for Bluetooth connectivity.

Boolean logic:

Boolean logic is a form of algebra in which all values are reduced to either TRUE or FALSE. Boolean logic is especially important for computer science because it fits nicely with the binary numbering system, in which each bit has a value of either 1 or 0. Another way of looking at it is that each bit has a value of either TRUE or FALSE.

BRF:

BRF stands for Braille Ready Format. BRF files are a widely recognized form of contracted braille. The files can be used with common braille reading devices or braille printers.

CCTV:

A low-vision closed-circuit television (CCTV) is an electronic magnifier that can magnify text, images, etc., at a much higher power than a regular magnifier. The CCTV monitor can magnify not only reading material but objects as well, such as a prescription bottle or label on a jar. NOTE: Some CCTV devices include a camera that allows viewing from a distance.

Cloud:

The cloud provides online storage that can be remotely accessed through an app. For example, cloud storage services back up documents, mail, photos, data, and gaming. Some examples of cloud services are iCloud, Google Drive, Google Docs, Google Calendar, Amazon Web Services, Dropbox, and Microsoft OneDrive. Even social networking websites such as Facebook and LinkedIn are technically cloud-based services because they store information online.

Coding:

Coding is the process of writing instructions for computer programs.

Coding Glossary from Swift Playgrounds by Apple:

- **Algorithm:** A step-by-step set of instructions or rules for solving a problem. For example, a list of steps used to make a cup of tea can be considered an algorithm.
- **Application:** Software, made up of code, that allows you to perform tasks. For example, you use the Messages application (app) to send and receive messages.
- **Argument:** An input value passed into a function to customize its behavior. For example, in the function call `move(distance: 3)`, 3 is an argument that specifies how many spaces to move.
- **Arithmetic Operator:** A symbol, such as `+`, `-`, `*`, or `/`, that performs a basic mathematical operation on one or more numbers. For example, `42/7` and `17 - 5` use arithmetic operators.
- **Array:** A collection that stores an ordered list of items of the same type. The same item can appear multiple times in different positions. For example, `highScores = [37, 34, 29, 26]` is an array on integers.
- **Array Out of Bounds Error:** An error caused by trying to access an array using an index that is outside of that array's boundaries. For example, the index 2 is outside of the boundaries of the following array: `[17, 42]`.
- **Assignment:** An action that sets the value of a variable or constant.
- **Assignment Operator:** The `=` symbol used to set the value of a variable. For example, `greeting = "hello"` sets the value of `greeting` to "hello."
- **Boolean:** A type that has a value of either true or false. For example, `9 < 7` returns a Boolean value of false because 9 is not less than 7.
- **Bug:** An error in code that prevents an application from running as expected.
- **Call:** To "call" a function in code is to instruct that function to run, performing the actions defined inside it. For example, calling the `moveForward()` function performs its actions that result in a forward move.

- **CamelCase:** A style of writing compound words in which each new word begins with a capital letter and contains no spaces. In lower CamelCase, the first letter of the entire word is lowercase. For example, the variable and function `var eyeColor` and `func checkForgems ()` use lowercase CamelCase.
- **Coding:** The act of composing commands, code structures, and algorithms to create a computer application.
- **Command:** Code that tells an application to perform a specific action.
- **Comparison Operator:** A symbol, such as `==`, `!=`, `<`, `>`, `<=`, used to compare two values. A comparison operator can be used in a condition of an “if” statement or while looping to return a Boolean value indicating whether a comparison is true. For example, `6 > 8` compares 6 and 8 and returns false.
- **Composition:** The process of combining small parts of an application to solve a larger problem.
- **Compound Assignment Operator:** An operator that combines assignment (setting the value of a variable) with another operation, such as addition or subtraction. For example, if the current value is 1, using `a += 3` adds 3 to 1 and assigns the result to `a`, so that the value of `a` is now 4.
- **Conditional Code:** Code that runs only when specific conditions are met. For example, “if” statements and “while” loops containing conditional code that runs only if or while a condition is true.
- **Constant:** A named container that stores a value that cannot be changed.
- **Debug:** To find and fix errors in code that prevent an application from running correctly.
- **Declaration:** A piece of code that creates something new in your application, such as a function, variable, custom type. For example, `let planet = “Earth”` declares a new constant, `planet`, and gives it a value of “Earth.”
- **Decomposition:** The process of breaking a large problem into smaller, more manageable pieces.
- **Define:** To provide the explicit value or behavior of a newly created piece of code, such as a function, variable, or custom type. For example, you define a function by providing a set of commands within the function to tell it what to do.
- **Dot Notation:** A form of syntax used to access the properties or call the methods of an instance. For example, `expert.toggleSwitch()` calls the `toggleSwitch()` method on the `expert` instance.
- **Else Block:** A block of code in an if statement. The else block runs if all conditions in the if statement are false.
- **Else If Block:** A block of code in an if statement, used to check a condition that is not checked by the if block or any other else if blocks.
- **Enumeration:** A type that defines a set of unique, but related, values called enumeration cases. For example, a `Direction` enumeration defines cases for each cardinal direction: north, south, east, and west. When assigning an enumeration to a variable or constant, always choose just one of its cases; for example, `let compassDirection: Direction = .north`.
- **For Loop:** A block of repeated code that runs a certain number of times.
- **Function:** A named set of commands that can be run whenever needed.
- **If Block:** The first block of code in an if statement. The if block runs if the condition in the if statement is true.
- **If Statement:** A code structure used to run code based on the value of one or more conditions. The first block of code in an if statement is the if block. An if statement might also contain other blocks that provide additional checks, such as an else block and else if block.
- **Index:** A number that represents the position of an item in an array.
- **Initialization:** The act of creating a new instance of a type, which includes setting initial values for any properties of the type.
- **Instance:** A value of a particular type. For example in `let greenPortal = Portal ()`, `greenPortal` is an instance of type `Portal`.
- **Int:** A type that stores an integer—a whole number, such as 10 or -42.

- **Iteration:** The act of repeating a process, such as performing the same action on each item in an array.
- **Local Variable:** A variable declared inside of a function, loop, or other statement. Local variables can't be accessed outside of the code in which they're defined.
- **Logical AND Operator:** A symbol (&) that combines two Boolean values where both values must be true for the overall code to be true. For example, a & b is true only when both a and b are true.
- **Logical NOT Operator:** A symbol (!) that inverts the Boolean value of a piece of code. For example, if a is true, then ! a is false.
- **Logical Operator:** A symbol, such as &, |, or !, that modifies or combines the Boolean logic values true and false.
- **Logical OR Operator:** A symbol (|) that combines two Boolean values where only one value must be true for the overall code to be true. For example, a | b is true when either a or b is true (or when both are true).
- **Loop:** A block of code that is repeated a certain number of times (for example, a for loop) or until a condition is met (for example, a while loop).
- **Method:** A function, or set of commands, that is defined inside a type.
- **Nest:** To place one repeating block of code, such as a loop, inside another.
- **Operator:** A symbol, such as +, -, or &, that represents an action on one or more values. For example, in 1 + 2, the addition operator (+) adds the numbers 1 and 2.
- **Outer Loop:** A repeating block of code (a loop) that contains another (inner) loop.
- **Parameter:** The name of an input value to a function, used in the definition of the function. For example, in move(distance: Int), distance is a parameter that takes a value of type Int.
- **Pattern:** A repeating set of circumstances or data.
- **Property:** A variable (a named container that stores a value) defined inside a type.

- **Pseudocode:** An easy-to-read description of an algorithm, usually written using a mix of everyday language and code.
- **Reusability:** A characteristic of code that allows it to be used in different situations within an application.
- **Right-Hand Rule:** A rule, typically used to generate maze-solving algorithms, that guides a character through a maze by following along the wall on the character's right-hand side.
- **State:** The stored information of a variable, application, or system at a given time.
- **Statement:** A structure, such as a loop or if statement, that organizes code in an application.
- **String:** A type that stores a series of characters, such as "Hello, world" or "dancing kittens."
- **Swift:** Apple's programming language, used for writing apps for iPhone, iPad, Mac, Apple Watch, and Apple TV.
- **Syntax:** The rules for writing code that computers can understand and run.
- **Type:** A named grouping of properties (the features) and methods (the behaviors) of a kind of data.
- **Variable:** A named container that stores a value that can be changed.

Cookies:

Cookies are small files created by some websites and stored on your computer's hard drive. The web browser's job is to handle information it receives from cookies on different websites. In fact, cookies can be managed in all modern browsers via the Options or Settings tab, and you can even choose to disable this feature altogether.

Collaborative Technologies:

Applications that facilitate teamwork and collaboration between students and experts around the globe; for example, knowledge-sharing tools, video conferencing, digital project spaces/sites, chats, collaborative schedulers.

Collaboration Platforms:

Examples of collaborative platforms include Blackboard, WhatsApp (cross-platform internet service communication app), FaceTime, Skype, and Snapchat.

CRAAP Test:

CRAAP Test stands for Currency, Relevance, Authority, Accuracy, and Purpose. Evaluating the currency, relevance, authority, accuracy, and purpose of sources you find is a crucial step in the process of writing research.

Cyberbullying:

Cyberbullying involves using the internet and related technologies to harm other people in a deliberate, repeated, and hostile manner. As it has become more common in society, particularly among young people, legislation and awareness campaigns have arisen to combat it.

DAW:

A Digital Audio Workstation, or DWA, is a digital system designed for recording and editing digital audio. It may refer to audio hardware, software, or both.

Digital Recorders/Digital Voice Assistant:

Signals can be stored as a sound file and transferred later to a text file through the use of voice recognition software. This is characterized by a clean, noise-free recording.

Digital Objects:

Any product, asset, or artifact that is digital, such as a visualization, model, or simulation.

Digital Resources:

Digital resources refers to any resource that is in digitized form and can be read and scanned by electronic media. Digital resources do not require separate space in a library, as these can be stored in a computer (locally or remotely).

Digital Text:

Digital text, or eText, is an electronic version of written text. Digital text can be found online, on your computer, or on a variety of hand-held electronic devices. With digital text, changing or customizing information to meet students' needs is easy.

Digital Tools:

Digital tools are software and platforms for teaching and learning that can be used with computers or mobile/smart devices to work with text, images, audio, and video.

E-commerce:

Electronic commerce, commonly known as e-commerce, is the buying and selling of products and services by businesses and consumers through an electronic medium without using any paper documents. E-commerce is widely considered to be the buying and selling of products over the internet, but any transaction that is completed solely through electronic measures can be considered e-commerce.

E-file:

A file acquired or accessed from the internet through an electronic format, such as computer, digital device, or electronic device.

E-reader:

An e-reader (electronic reader) is a device for reading content, such as e-books, newspapers, and documents. A standalone e-reader typically has wireless connectivity for downloading content and conducting other web-based tasks.

Electronic Device:

Any device requiring a battery or electricity to operate.

Electronic Reference:

For the purpose of research conducted using databases and webpages, these are defined as online information resources, including bibliographic databases, electronic reference books, search engines for full-text collections, digital collections of data, and data sets. This may include individual reference e-books and e-journals.

Email:

Short for “electronic mail,” email is a method of composing, sending, and receiving messages over electronic communication systems.

FaceTime:

An iOS video chat service (Apple).

Flipped Classroom:

The flipped classroom is a model of teaching in which a student’s homework is the traditional lecture viewed outside of class on a video podcast (vodcast). Class time is spent on inquiry-based learning which may include what some traditionally consider a student’s homework assignment. This term is synonymous with “reverse classroom.”

FLV Media Player:

Flash Video is a file format to deliver video over the internet using the Adobe Flash Player. The F4V format is based on ISO media file format and is also supported by Adobe Systems.

GIF:

GIF is an acronym for Graphic Interchange Format and is the widely used compressed image format developed by CompuServ in 1987. GIF has a palette of up to 256 colors, which greatly reduces the file size for quick transfer. GIF is suitable for icons, animation, and web pages, but it is unsuitable for photographic file transfer because it lacks the full color range.

GPS:

GPS is the acronym for Global Positioning System. GPS is a satellite navigation system used to determine ground position and velocity (location, speed, and direction).

Intellectual Property:

Content or ideas created by an individual or entity; for example, music, photos, narration, text, and designs.

Internet Access:

Internet Access is a service that provides access to the global system of interconnected computer networks known as the internet. For education purposes, one will use the LEA service provider.

iTunes University:

iTunes U is a section of the iTunes Store where users can download free educational course content from many colleges and universities, nonprofit educational institutions, and K-12 organizations.

JPEG:

JPEG is the acronym for Joint Photographic Experts Group; named after the group that developed the format. It is a compressed image file format. JPEG images are not limited in color range like GIF images. JPEG is best for compressing photographic images, however, some image quality is lost in compression.

Low-Vision Technology:

Low-vision technology can make it possible to read, write, browse the internet, watch TV, use the computer, access consumer information, and travel around the community.

Magnification:

The process of enlarging the size of something, as an optical image. Something that has been magnified is an enlarged representation, image, or model. Magnification software allows low-vision computer users to more easily read portions of the screen by magnifying the text.

Mashup:

Mashup's original meaning was the meshing of two different styles of music into one song, such as meshing classic rock with hip-hop. Combining different video clips from different sources is also considered a mashup. A mashup can also be a web application that combines multiple services into a single application, such as using Google Maps on a web forum with the purpose to consolidate information with an easy-to-use interface.

Mobile Learning:

The term M-Learning, or "mobile learning," has different meanings for different communities. Although related to e-learning, Edtech and distance education, it is distinct in its focus on learning across contexts and learning with mobile devices. One definition of mobile learning is "any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies."

MP4 Players:

MP4 is a file format created by the Moving Picture Experts Group (MPEG) as a multimedia container format designed to store audiovisual data. The MP4 is largely replacing earlier multimedia file formats and creating some changes in the way that vendors sell audiovisual files to the public.

MPEG:

MPEG is the acronym for Moving Picture Experts Group, which works with the International Organization for Standardization (IOS) and develops standards for audio and video compression. The files are for movies containing audio and video.

Multimedia formats:

Multimedia is the integration of multiple forms of media. This includes text, graphics, audio, video, etc. For example, a presentation involving audio and video clips would be considered a "multimedia presentation." Educational software that involves animations, sound, and text is called "multimedia software."

Multimedia Resources:

Multimedia involves integration of animation, audio, graphics, text, and full-motion video through computer hardware and software and touch screen tablet applications for education, training, or leisure/recreation. Resources include, but are not limited to, Kid Pix, Creative Writer 2, Image Blender, Inspiration, Kid Works Deluxe, Kidspiration, Nearpod, Shadow Puppet, Spiral.ac, Biteslide, Adobe Spark, Animoto, Prezi, Haduko, PowerPoint, Keynote, and Knovio, as well as YouTube and Kids YouTube.

Netiquette:

Net etiquette, or "netiquette," refers to etiquette on the internet. Good netiquette involves respecting others' privacy and not doing anything online that will annoy or frustrate other people.

Online Tutorial:

An online tutorial is a video that takes the learner through a series of steps to learn how to use a product or learn about a concept. A tutorial can also be a class or workshop that provides special (often individual or small group) instruction in a particular area. Programmed instruction provided to a user at a computer terminal may involve the use of a specific software application.

Operating System:

An operating system is a set of programs that manage computer hardware resources and provide common services for application software. The operating system is the most important type of system software in a computer system or device.

Paths To Literacy for Students Who Are Blind or Visually Impaired

Definitions:

- **Dual Media:** The use of both print and braille as modes for reading and writing. Some eye conditions in which there is a gradual loss of vision may be a factor in choosing this option.
- **General Literacy:** Speaking, listening, object communication, sign language, concept development, and an understanding of one's environment and experiences are all part of a more inclusive view of literacy.
- **Auditory Strategies:** Definitions of literacy have expanded to include auditory skills as another type of literacy. Many students with visual impairments access information from text through auditory means.
- **Struggling Readers:** Struggling readers may have learning disabilities, such as dyslexia. Emotional and behavioral challenges, such as anxiety or ADHD, may also affect literacy skills.
- **Digital Object:** Any product, asset, or artifact that is digital, such as visualizations, models, or simulations.
- **Responsibly Repurpose/Remix:** Changing the way something was originally used or combining original assets in a unique way, seeking permission to use content from the author/creator as needed, and using attributions.
- **Platform:** Mode of information delivery. For example, a blog, video, podcast, slide deck presentation, digital poster, social media site, or other online tool.
- **Digital Tools:** For example, brainstorming tools, flow charts, drawing or mark-up tools, 2D or 3D design software, note-taking tools, and project management tools.
- **Digital Tools to Connect With Learners:** Tools, such as video conferencing, chats, virtual field trips, multimedia online games, email, and social media, that are used to connect with other learners around the world.
- **Collaborative Technologies:** Applications that facilitate teamwork and collaboration between students and experts around the globe. For example, knowledge-sharing tools, video conferencing, digital project spaces/sites, chats, and collaborative schedulers.

Platform:

Mode of information delivery. For example, a blog, video, podcast, slide deck presentation, digital poster, social media site, website, or other online tool.

PDF:

Portable Document Format (PDF) is a multi-platform file format developed by Adobe Systems in 1991. A PDF can capture a document's text, font, image, and formatting from other documents. A PDF will look the same on PC and Apple devices. PDFs are accessible to screen readers such as JAWS.

Peripherals:

Peripherals are any external devices that provide input or output for the computer. For example, a keyboard and mouse are input peripherals, whereas a monitor and printer are output peripherals. Some peripherals provide both input and output for a computer such as an external hard drive.

Personal Digital Assistant (PDA) Note-Takers:

Any electronic note-taking device that may or may not include a braille display or features that include word processing, audio input/output, calculator, book reader, web browser, email, streaming audio, chat, media player, etc.

Pop-Ups:

Pop-up ads, or "pop-ups," are forms of online advertising that are intended to attract web traffic or capture email addresses.

Power Strip:

An electrical device consisting of a cord with a plug on one end and several sockets on the other. A power strip (also known as an extension block, power board, plug board, trailer lead, and many other variations) is a block of electrical sockets that attaches to the end of a flexible cable (typically with a main plug on the other end), allowing multiple electrical devices to be powered from a single electrical socket.

Programming

Programming is the process of taking coded instructions and making the target act according to them.

Refreshable Braille:

A refreshable braille display, or braille terminal, is an electro-mechanical device for displaying braille characters, usually by means of raising dots through holes in a flat surface. A braille display provides access to information on a computer or tablet screen by electronically raising and lowering different combinations of pins in braille cells.

Responsibly Repurpose or Remix Digital Resources:

Changing the way something was originally used or combining original assets in a unique way and, as needed, seeking permission to use content from the author/creator and using proper attributions.

RTF:

RTF stands for Rich Text Format. It is a universal format that can be read by most processors. It is a document file format standardized by Microsoft for encoding text and graphics.

Screen-Reading Software:

Software that reads the contents of a computer and tablet screen, converting the text to speech. Screen readers are designed for specific operating systems and generally work with most applications.

Scrum:

Scrum is a framework for project management that emphasizes teamwork, accountability, and iterative progress toward a well-defined goal. The framework begins with a simple premise: Start with what can be seen or known. After that, track the progress and tweak as necessary. The three pillars of Scrum are transparency, inspection, and adaptation.

SD Card:

A Secure Digital (SD) card is a tiny memory card used to store data in devices such as digital cameras, mobile phones, PDAs, portable music devices, and digital voice recorders. An SD card is a removable electronic chip that can hold data and transfer data from one electronic device to another.

Sideloadng:

Sideloadng is a term similar to upload and download, but in reference to transferring data between two devices, such as a computer and a mobile device via USB, Bluetooth, or SD card.

Skype:

An internet communication video service.

Smartpen:

An electronic ballpoint pen that digitizes, stores, and transfers what is written or drawn to the computer. Instead of a mouse, a digital pen provides a very natural way to hand-write and hand-draw on a computer. Because it stores everything internally, the data transfer to the computer via wireless or USB can be done at a later time if needed. Digital pens may also include audio recording.

Smart:

“Smart” refers to speaker devices that are voice-assisted, voice-controlled, and voice-activated systems for independent living. Smart speaker devices include Amazon Echo (Dot and Spot) and Google devices. Voice-controlled systems include Siri, Alexa, Google Now, Microsoft’s Cortana, and Apple’s HomePod. Voice-activated devices that are household appliances, including refrigerators, thermostats, robotic vacuums, and TVs, feature voice-activation software and apps.

Social Media:

Social media is a common term for a variety of internet applications that allow users to create content and interact with each other. This interaction can take many forms, but some common types include:

- Sharing links to interesting content produced by third parties.
- Public updates to a profile, including information on current activities and even location data.
- Sharing photos, videos, and posts.
- Commenting on photos, posts, updates, videos, and links shared by others.
- Email and apps, such as Instagram, Twitter, and Facebook. Please note: Adult supervision is suggested with students in kindergarten through grade 12.

Surge Protector:

Surge protectors safeguard against irreparable damage to sensitive devices and equipment (such as computers) by preventing electrical spikes and surges from reaching their internal components. A surge protector is plugged into a wall outlet and allows the user to plug other electronic devices into it.

Tablet:

A tablet is a portable computer that uses a touch screen as its primary input device. Most tablets are slightly smaller and weigh less than the average laptop.

Text-Based Coding:

Text-based coding is writing instructions using text to program a task.

Tutorial:

A tutorial is created as a learning tool. Tutorials help people learn new skills by using a step-by-step process. Tutorials can be found online for do-it-yourself help, troubleshooting support, how-to instructions, and more.

URL:

URL is the acronym for “Uniform Resource Locator.” A URL is the address of a specific website or file on the internet. It cannot have spaces or certain characters, and it uses forward slashes to denote different directories.

Video Conferencing:

Conducting a conversation or meeting between two or more participants at different sites by using computer networks to transmit audio and video data. Each participant has a device with a video camera, microphone, and speakers.

Video Magnifier:

A video magnifier is an electronic magnifier that uses a camera and a screen to make text easier to read. The camera image will be magnified and the contrast can be increased, making it even easier to read. A video magnifier or CCTV system can be handheld or stand-mounted to project a magnified image onto a video monitor, TV screen, tablet screen, or computer monitor. Cameras with zoom lenses provide variable magnification.

Virtual Environment:

A computer-generated, three-dimensional representation of a setting in which the user perceives him- or herself to be, and within which interaction takes place. This also called virtual landscape, virtual space, or virtual world. This computer-simulated environment enables its users to create virtual representations of themselves, called avatars, through which the user interacts with the “world.”

Voice Assistant:

A voice assistant is a digital assistant that uses voice recognition, natural language processing, and speech synthesis to aid users through phones and voice recognition applications (for example, Siri from Apple). Voice assistants are integrated into smart speaker devices like Google Home and Amazon Echo, and directly into iOS operating systems like Apple's Siri and Microsoft's Cortana. Voice assistants are also in vehicles, home environment systems (such as heating and lighting controls), TVs, appliances, and speaker systems.

Voice Command Device:

A voice command device (VCD) is a device controlled with a voice user interface. Voice user interfaces (software and apps) have been added to cars, home automation systems, computer operating systems, and home appliances like robotic vacuums, washing machines, microwave ovens, and TV remote controls. VCDs are also known as smart speaker devices, voice-assisted devices, and voice-activated devices. Voice-activated devices are the primary way of interacting with virtual assistants on smartphones and smart speakers. For example, Amazon Echo and Google Home devices.

WAV:

Waveform Audio File Format (WAVE, more commonly known as WAV due to its filename extension) is used to store sound data. It is the main format used on Windows systems for raw and typically uncompressed audio. It is similar to AIFF (iOS) format, and both WAV and AIFF (and most DAW applications and audio programs) can read and write both formats.

Webcast:

Using the internet to broadcast live or delayed audio and/or video transmissions, much like traditional television and radio broadcasts. The data transmission goes one way and does not allow interaction between the presenter and the audience.

Webinar:

Short for web-based seminar, a presentation, lecture, workshop, or seminar that is transmitted over the web. A key feature of a webinar is its interactive element, including the ability to give, receive, and discuss information.

While Loop:

A block of code that runs for as long as a given condition is true. When the condition changes to false, the loop stops running.

Wi-Fi Access:

A mechanism that allows electronic devices to exchange data wirelessly over a computer network. A device enabled with Wi-Fi, such as a personal computer, video game console, smartphone, tablet, or digital audio player, can connect to a network resource such as the internet via a wireless network access point. A Wi-Fi-enabled device can connect to the internet when it is within range of a wireless network.

Wireframe:

An outline of an item, such as a gem, switch, or block in the puzzle world. A wireframe is used to indicate the possibility that the item could randomly appear each time the puzzle is run.

WMV:

Windows Media Video (WMV) is based on Microsoft Advanced Systems Format (ASF) container format and compressed with Windows Media compression. Apple users can use QuickTime to play WMV files.

Assistive Technology Resources

AbleNet, Inc.

AbleNet provides an essential selection of assistive technology and curricula used around the world every day. AbleNet products include switches, speech-generating devices, activity supports, accessible toys, apps and software, assistive technology kits, and computer and tablet access. AbleNet acquired IntelliTools in 2014 and offers the accessible keyboard IntelliKeys® with the device's accompanying products.

ablenetinc.com

Alt+Shift

Alt+Shift collaborates with districts to create and sustain accessible educational environments. Alt+Shift offers professional training, equipment lending library, technical assistance, and implementation planning to improve student outcomes.

altshift.education

American Council of the Blind (ACB)

The American Council of the Blind (ACB) is a national organization of Blind, Visually Impaired, and sighted individuals whose purpose is to work toward independence, security, equality of opportunity, and improved quality of life for all people who are Blind or Visually Impaired (BVI). Currently, ACB works with technology vendors to ensure accessibility to information and communication. ACB also partners with municipalities to design and build accessible infrastructure. The organization also works to ensure educational accessibility for people who are BVI and strives for equal participation of people who are BVI in all areas of social and civic life.

acb.org

American Foundation for the Blind (AFB)

AFB provides research from *The Journal of Visual Impairment and Blindness*, guides businesses to create accessible products and websites, advocates for policies in the work environment, classroom resources, and equal opportunity. AFB's monthly publication, *AccessWorld® Magazine*, offers news, reviews, and trends in technology and visual impairment.

afb.org

American Printing House for the Blind (APH)

APH is the world's largest nonprofit organization creating educational, workplace, and independent living products and services for people who are Blind and Visually Impaired. Products include Learn Keys and Talking Typer. Fred's Head, an APH blog, includes stories and interviews, product reviews, and information about new technology.

aph.org

Apple Accessibility Support

Learn about the many accessibility features built into your Mac, iPhone, iPad, and iPod Touch. Turn on accessibility features such as VoiceOver, Guided Access, and AssistiveTouch. Find out more about supported braille displays and hearing aid compatibility.

support.apple.com/accessibility

A T Guys

A T Guys, based in Kalamazoo, Michigan, provides affordable technology solutions for consumers, businesses, and educational customers. A T Guys' product line includes mobile phone software and accessories, portable electronics, screen readers, braille translation software, and accessible games.

atguys.com/store

Blackboard

Create powerful learning experiences, design customized learning paths, and influence performance in real-time. Accessibility in HTML for improved reading on mobile phones, electronic braille for people who are visually impaired, and audio for learning on the go. Blackboard Learn makes navigation easier for users who are visually impaired, and Ally automatically scans your original content. Blackboard Collaborate is a collaborative, innovative, and mobile learning platform that allows the creation of virtual classrooms and online meetings.

- blackboard.com
- [Blackboard Collaborate](http://blackboard.com/teaching-learning/collaboration-web-conferencing/blackboard-collaborate) (blackboard.com/teaching-learning/collaboration-web-conferencing/blackboard-collaborate)

The Blind Geek Zone

The Blind Geek Zone is hosted by Rick Harmon, who lost his sight in 2004. Harmon offers sources to the Blind/Visually Impaired community for information, audio tutorials, sharing user-submitted podcasts, gadget demonstrations, useful links to products, services, and resources. The Blind Geek Zone is on Twitter and Facebook.

blind-geek-zone.net

Boardmaker

In 2014, Dynavox was purchased by the Tobii Group, headquartered in Stockholm, Sweden. Shortly after the acquisition, the company launched Boardmaker Online as a subscription service. Today, Boardmaker Online is on cloud-based software and has more than 30,000 individual picture symbols available in different styles (Classic, ThinLine, High Contrast, and Persona). They have been translated into 44 languages and are being developed continuously.

goboardmaker.com

Bookshare®

Bookshare® makes reading accessible for people with dyslexia, blindness, cerebral palsy, and other reading barriers. Readers can use Bookshare to customize their experience to suit their learning style and find virtually any book they need for school, work, or leisure reading. Membership is free to schools and individual students. A Bookshare membership offers unlimited access to accessible books, textbooks, newspapers and magazines. Additionally, free access technology makes it easy to read books on devices.

bookshare.org

Braille and Audio Reading Download (BARD) Service from the National Library Service (NLS) for the Blind and Physically Handicapped

Eligible users (must be a member of NLS) may download and read any book, magazine, or other material found on the BARD website. BARD contains books, magazines, and music scores in audio and braille formats, with new selections added daily.

nlsbard.loc.gov

Future Aids: The Braille Superstore

An online store that carries braille, tactile, audible, and talking products for anyone who is Blind/Visually Impaired or has low vision. Braille Superstore has hundreds of daily living aids, writing supplies, and recreational items. Products include Talking Typing Teacher.

braillebookstore.com

Braille Innovations

Braille Innovations provides tools for classroom teachers and resources for teaching braille. Offerings include Know Thyself and Others for secondary students, Rhythm's Oh So Sweet (braille songs and rhythms), Categorized Braille Resource Cards (American English braille code cards), Bee Bop Braille (teaching the code through categories), Beginning Braille (supplemental braille materials) and Armed With Knowledge (teaching your school team about Blindness and Visual Impairment).

sites.google.com/site/brailleinnovations

Carroll Center for the Blind

The Carroll Center serves all ages and all stages of vision loss. The Carroll Center has provided help for individuals who are Blind/Visually Impaired since 1936 and offers services that include vision rehabilitation, vocational and transition programs, assistive technology training, educational support, and recreation opportunities.

carroll.org

Claro Software

Claro Software develops assistive technology software for people with print and reading disabilities like dyslexia. Since 2018, Claro Software has been owned by Lingit AS, a Norwegian assistive technology company. Products include text-to-speech software, speech synthesis, word prediction, spell check, and switch access, and it can be used with Microsoft Windows, Apple iOS, Google Chromebook, iPad, iPhone, Android, and on the web.

clarosoftware.com

Code Factory

Code Factory's expertise is applied in a wide range of industries, from mainstream consumer electronics to assistive technology. Code Factory partners with organizations and companies to provide speech synthesis technology to products and digital accessibility for products. Some of the companies Code Factory partners with are Nuance, Verizon, Sprint, Microsoft, and Nokia.

codefactoryglobal.com

Code Jumper™

Code Jumper™ is an innovation that teaches computer coding to students who are Blind or Visually Impaired. Children learn basic programming basics such as sequence, iteration, selection, and variables. The Code Jumper™ kit includes a carrying case with a hub and assortment of pods, plugs, and cords, an app, a quick-start sheet (in print and braille), and online student and teacher lesson plans. Code Jumper™ was designed by Microsoft and developed by APH.

codejumper.com

Common Sense Education

Common Sense is a nonprofit organization dedicated to providing trustworthy research-backed information, curricula, lesson plans, activities, and training for educators, parents, and advocates. Common Sense's mission is to ensure digital wellbeing for children. Common Sense has a digital citizenship curriculum with free lesson plans, tutorials, and activities for teachers. It also includes guidance, posters, toolkits, lesson plans, social media awareness, and cyberbullying prevention, identification and response.

- commonsense.org/education
- commonsense.org

Creative Commons

Creative Commons is a nonprofit organization devoted to expanding the range of creative works available for others to build upon legally and to share. The organization has released several copyright licenses, known as Creative Commons licenses, for free to the public. These licenses allow creators to communicate which rights they reserve and which rights they waive for the benefit of recipients or other creators.

creativecommons.org

CViConnect

CViConnect is dedicated to the education, training, and support of children with CVI. It features new technologies designed for use with children with CVI and features a new and innovative iPad-based software for children with CVI.

cviconnect.co

Digital Citizenship

R U a Cyber Detective? is a digital citizenship game for secondary students from the New South Wales Department of Education in Australia. Students take on the role of a junior detective at the Cyber Detective Agency. Assigned an urgent case involving stolen identities, students are challenged to use their digital citizenship skills in a range of mock situations, including chat rooms and using webcams, as they race against time to recover the identities from Dr. Hiss. At the conclusion of the game, students make a five-point guide about staying safe online and receive a Junior Detective Award.

digitalcitizenship.nsw.edu.au/resources/r-u-a-cyber-detective

Discovery Education

Discovery Education transforms classrooms, empowers teachers, and captivates students by leading the way in providing high quality, dynamic, digital content to school districts. All content is aligned to state standards, can be aligned to custom curricula, and supports classroom instruction regardless of the technology platform.

discoveryeducation.com

Digital Resources: Internet

- *Ask*

Ask.com helps over 100 million people find answers on the internet. Ask Media Group builds digital experiences that educate and inform the millions of people who visit their sites. Ask Media Group operates dozens of websites that help curious people find the information they need.

ask.com

- *Bing*

A browser option to surf the internet. Bing is a search engine owned by Microsoft.

bing.com

- *Google*

Google's mission is to organize information and make it universally accessible and useful. Search the world's information, including webpages, images, videos and more.

google.com

- *Google Chrome*

A fast, secure, and free web browser built for the modern web. Chrome syncs bookmarks across all devices, fills out forms automatically, and more. Chrome is a web browser designed to be fast.

google.com/chrome/index.html

- *Google Docs*

Google Docs allows the creation, revision, and sharing of web-based documents, spreadsheets, and presentations. Store documents online and access them from any computer.

docs.google.com

- **Google Drive**

Google Drive is a file storage and synchronization service developed by Google. Google Drive allows users to store files on servers, synchronize files across devices, and share files. In addition to its website, Google Drive offers apps with offline capabilities for Windows, Apple computers, and Android and iOS smartphones and tablets. Google Drive offers free cloud storage for personal use.

google.com/drive

- **Google Earth**

Google Earth is a photorealistic, digital version of our planet.

earth.google.com

- **Google Maps**

Google Maps is a web-mapping service developed by Google. It offers satellite imagery, aerial photography, street maps, 360° panoramic views of streets (Street View), real-time traffic conditions, and route planning for traveling by foot, car, bicycle, or public transportation.

maps.google.com

- **Internet Explorer**

An internet browser and set of technologies created by Microsoft.

microsoft.com

- **Microsoft Edge**

The Microsoft Edge platform enhances and extends your browser experience. It runs on Windows, macOS, iOS, and Android devices. On January 15, 2020, Microsoft Edge updated to a new version. At the time of this publication, the jury is still out as to the compatibility of Edge with JAWS 2020 after field testing.

microsoft.com/en-us/windows/microsoft-edge

- **Mozilla Firefox**

Mozilla Firefox, or simply Firefox, is a free and open-source web browser developed by the Mozilla Foundation and its subsidiary, Mozilla Corporation.

mozilla.org/en-US/firefox/new

- **Safari**

Safari is a web browser that is known for its simple and minimalistic interface. Apple built Safari to be the browser for Mac, iPhone, and iPad. Safari for Mac is fast, energy efficient, and has built-in privacy features. iCloud and Safari can work seamlessly with all iOS devices.

apple.com/safari

Don Johnston

This online company has a variety of products to help struggling readers and writers achieve positive results. Products include cause-effect software.

learningtools.donjohnston.com

Edmodo

Edmodo provides teachers and students a secure place to connect, collaborate, and share content and educational applications, and access homework, grades, class discussions, and notifications.

new.edmodo.com

EdTechTeacher

EdTechTeacher's mission is to create relationships with educators and support their quest to enrich student learning experiences through emerging technologies and innovative models of classroom instruction. EdTechTeacher partners with schools; provides workshops, courses, and summits for technology training; and customizes training for specific needs.

edtechteacher.org

Edutopia

The George Lucas Educational Foundation is dedicated to transforming K-12 education so that all students can acquire and effectively apply the knowledge, attitudes, and skills necessary to thrive in their studies, careers, and adult lives. The Foundation supports students with disabilities and methods to find and select technologies that help all students reach their learning goals. Among many topics it provides is assistive technology resources, blog posts, articles, and videos related to understanding, selecting, and assessing assistive technology.

edutopia.org

EmergingEdTech

Kelly Walsh, a teacher at The College of Westchester in White Plains, NY, is the author of EmergingEdTech, a blog with a weekly newsletter offering emerging technology to engage students and teachers that can help make the shift to student-centered learning. The site provides app resources, custom training, and a wide variety of posts, such as video tutorials, cyber safety awareness, digital literacy, and the flipped classroom. Walsh conducts training sessions and workshops online or in person.

emergingedtech.com

ePals

Kids learn together in well-rounded, collaborative global classroom. ePals is a global community in which teachers, students, and parents from more than 99 countries can safely connect to classrooms by collaborating on project-based learning activities. ePals promotes digital citizenship and social and emotional learning. Included are classroom-ready projects and activities with quality, standard-aligned content from respected educational brands as well as collaborative learning tools such as blogs, wikis, and media galleries.

epals.com

FaceTime

Use FaceTime to make video and audio calls from your iPhone, iPad, or iPod Touch. Supports FaceTime audio with call waiting and Memoji faces.

support.apple.com/en-us/HT204380

Flying Blind, LLC

Flying Blind's mission is to empower individuals who are Blind/Visually Impaired (BVI) with the necessary adaptive technology solutions to make them independent and efficient in unlimited capacities. This weekly online newsletter offers adaptive technology advances for people who are BVI through posts such as Top Tech Tidbits, featuring adaptive technology advice, EyePod Technocasts on various products, YouTube videocasts, assessment advice, links to beneficial adaptive technology tools, and more. Free newsletter subscription.

flying-blind.com

Freedom Scientific

This company develops, manufactures, and markets technology-based products that provide equal access to information and computing for those with vision impairments or learning disabilities. Products include MAGic, JAWS, and ZoomText.

freedomscientific.com

Hadley

The mission of the Hadley Institute for the Blind and Visually Impaired is to promote independent living through lifelong distance education programs for individuals who are Blind or Visually Impaired, their families, and blindness service providers. Hadley offers free education to anyone with a visual impairment, as well as families and professionals serving them. Hadley's website offers distance education, instructional videos, a podcast that interviews experts on a wide range of topics unique to vision loss, discussion groups, and online courses that are free to people who are BVI.

hadley.edu

Hour of Code

The Hour of Code started as a one-hour computer science introduction that was designed to demystify “code” and show that anyone can learn the basics, and to broaden participation in the field of computer science. If you use a screen reader, the Quorum tutorial for beginners or the Quorum tutorial for comfortable students are great places to start. The Hour of Code takes place each year during Computer Science Education Week in December, but an Hour of Code can be hosted year-round.

hourofcode.com/us/learn

HIMS, Inc.

HIMS, INC. is a global manufacturer and distributor that provides braille, magnification, and accessible healthcare devices. It provides tools designed to increase productivity and independence, such as BrailleSense note takers.

hims-inc.com

HumanWare

For more than 30 years, HumanWare’s inspirational vision has resulted in a range of highly intuitive and intelligent solutions that empower people who are Blind/Visually Impaired by giving them the independence to participate effectively within a sighted world.

humanware.com/en-usa/home

iKeepSafe

iKeepSafe’s mission is to provide a safe digital landscape for children, schools, and families by supporting the protection of student privacy while advancing learning in a digital culture. iKeepSafe provides educational resources such as digital citizenship activities, privacy and security tips, and training in data privacy.

ikeepsafe.org

International Society for Technology in Education (ISTE)

Today’s students must be prepared to thrive in a constantly evolving technological landscape. The ISTE Standards for Students are designed to empower student voices and ensure that learning is a student-driven process. Connect with other educators in the ISTE Standards Community and learn how to use the standards in the classroom with the ISTE Standards for Students ebook.

iste.org/standards/for-students

Judy Lynn Software, Inc.

Judy Lynn Software is an online company that develops switch-accessible software programs for Windows, iPad, and Android tablets.

judylynn.com

LearnZillion

LearnZillion is a learning platform that combines video lessons, assessments, and progress reporting for mathematics (Grades 6-8 and Algebra 1, Geometry, and Algebra 2) and English language arts (Grades K-5). Each lesson highlights a Common Core standard. Curricula give teachers access to lesson plans with built-in student-facing materials. Teachers can spend less time preparing materials and go straight to strategizing teaching moves.

learnzillion.com

Learning Ally

Founded in 1948 as Recording for the Blind, Learning Ally serves more than 300,000 K-12, college, and graduate students as well as veterans and lifelong learners—all of whom cannot read standard print due to Blindness, Visual Impairment, dyslexia, or other learning disabilities. Learning Ally offers a collection of digitally recorded textbooks and literature, Learning Ally Lab, a student-centric approach that matches each student with instruction that works best, and pilots and partnerships. There is a membership fee for individuals and schools.

learningally.org

Media Education Lab

The Media Education Lab from the University of Rhode Island is one of the leading providers of multimedia curriculum resources for K-12 media literacy education. Take advantage of the extensive collection of free teaching resources. Topics include understanding copyright, digital media and literacy, implicit bias, propaganda, and the PBS News Hour Student Reporting Lab.

mediaeducationlab.com/curriculum/materials

Michigan Department of Education - Low Incidence Outreach (MDE-LIO)

The MDE- LIO site is home to the Michigan Assistive Technology Guidelines for Teachers of Students Who Are Blind or Visually Impaired, which offers pre-kindergarten through grade 12 guidelines for teachers as well as resources for assistive technology (AT) skills, AT assessments, teacher assistance, and apps.

mdelio.org

Michigan Integrated Technology Competencies for Students (MITECS)

MITECS is the acronym for the Michigan Integrated Technology Competencies for Students. These competencies were released in December 2017 by adapting the 2016 International Society for Technology in Education (ISTE) Standards for Students. They replace the 2009 Michigan Educational Technology Standards for Students (METS-S).

<https://goopenmichigan.org/hubs/mitecs>

Moodle

Moodle is a course management system (CMS), also known as a learning management system (LMS) or virtual learning environment (VLE). It is a free web application educators can use to create effective online learning sites. Communicate with automatic alerts on new assignments, deadlines, and forum posts, and send private messages. Participate in collaborative learning by working and learning together in forums, wikis, and quizzes, and get feedback through polls and surveys.

moodle.com

National Center for Blind Youth in Science

The NCBYS is dedicated to providing resources and information for students who are Blind/Visually Impaired to learn and understand scientific and mathematical concepts. NCBYS offers opportunities in science through demonstration projects and partnerships in public schools. It provides technical support and mentoring for projects in science and math.

blindscience.org

National Federation of the Blind (NFB)

The National Federation of the Blind is the largest membership organization of individuals who are Blind/Visually Impaired (BVI) in the United States. The National Federation of the Blind offers several programs, services, and resources for educators of students who are BVI or have low vision. The NFB assists with advocacy, education, research, technology, and programs encouraging independence and self-confidence.

nfb.org

National Library Service for the Blind and Physically Handicapped (NLS)

National Library Service (NLS) is a free braille and talking book library service as well as an equipment lending library for NLS materials. Materials are loaned to individuals who are Blind/Visually Impaired, have temporary or permanent low vision, or have a physical disability that prevents them from reading or holding the printed page.

loc.gov/nls

National Geographic

The National Geographic Society's website is useful for secondary students for research and information on countries, science, technology, explorers, and the environment. The site provides maps, photography, games, adventure, videos, movies, news, and apps. The National Geographic Kids site has activities such as games and videos, and students can explore various space and science topics in fiction and nonfiction books.

- nationalgeographic.com
- kids.nationalgeographic.com

NetSmartz

NetSmartz is NCMEC's online safety education program. It provides age-appropriate videos and activities to help children be safer online and become more aware of potential online risks. NetSmartz also empowers children to prevent victimization by making safer choices on- and offline. NSTeens teaches tweens and teens about making safer choices online. Teaching materials are free.

- missingkids.org/NetSmartz
- nsteens.org

New York Public Library (NYPL) Digital Gallery

The NYPL Digital Gallery provides free and open access to digitized prints, photographs, maps, manuscripts, streaming videos, and images from the New York Public Library's collections.

digitalcollections.nypl.org

NVDA (NonVisual Desktop Access)

NonVisual Desktop Access (NVDA) is a free and open-source screen reader for the Microsoft Windows operating system. Providing feedback via synthetic speech and braille, NVDA enables people who are Blind/Visually Impaired to access computers running Windows for no more cost than a sighted person. Major features include support for more than 55 languages and the ability to run entirely from a USB drive with no installation. NVDA is open-source software, which means the code is accessible to anyone.

nvda-project.org

ObjectiveEd/Blindfold Games

ObjectiveEd's mission is to provide students with disabilities, and the parents and professionals dedicated to their education, digital curriculum and integrated performance monitoring and reporting tools that will help the students achieve their best educational outcomes. Features game-based digital curriculum for BVI with game-based practice in Assistive Tech skills, Braille Literacy, and IEP based skill improvement games that provide monitoring of student's goals.

objectiveed.com

Paths to Literacy

This website is a joint project between Perkins School for the Blind and Texas School for the Blind and Visually Impaired (TSBVI). The braille section of the website offers an overview, instructional strategies, pre-braille, tactile graphics, technology for braille readers, sources of print/braille books, tools for writing braille, braille production, and brailler repair. Users may post content, and there is a forum for questions and answers related to braille literacy.

pathstoliteracy.org

PBS Kids

A website for pre-K through grade 2. Play educational games, watch PBS KIDS shows and videos, and find coloring and music activities.

pbskids.org

Perkins School for the Blind

Perkins School for the Blind is committed to providing education and services that build productive, meaningful lives for children and adults around the world who are Blind, DeafBlind, or Visually Impaired with or without other disabilities. Support for teachers includes on-site, online, and self-paced tutorials. The eLearning teaching resources topics are assessment, best practices, career education, Common Core curriculum, expanded core curriculum, math, motor skills, physical education, science, social skills, and social studies. Perkins offers a lending library and over-the-phone reading service.

- perkins.org
- perkinselearning.org/scout/resources/expanded-core-curriculum

RJ Cooper & Associates

This online company develops apps, iPad and computer accessories, software, and hardware for persons with special needs. Products include computer access software, switches, iPhone and iPad Touch apps, gadgets, tools for text, TV-streaming controllers, recreation and gaming.

store.rjcooper.com

Scholastic

The corporate mission of Scholastic is to encourage the intellectual and personal growth of all children, beginning with literacy, the cornerstone of all learning. Scholastic provides teaching tools for educators, Book Fairs, classroom magazines, and books in digital and print formats for the next generation of learners.

scholastic.com

Serotek Corporation

Serotek was founded in 2002 by an entrepreneur who was Blind and wanted to create products that were powerful, intuitive, affordable, and extremely easy to use for the beginner computer user who is Blind or Visually Impaired. Serotek's products have evolved over the years, but the company remains true to its mission of providing Windows accessibility anywhere to its customers. Serotek features a premier line of software products to help you achieve maximum productivity and optimal entertainment.

- serotek.com
- [Sero \(formerly iBlink Radio\) on the App Store](https://apple.co/2li0yOe) (apple.co/2li0yOe)
- [Sero \(formerly iBlink Radio\) Apps on Google Play](https://bit.ly/38IDA3i) (bit.ly/38IDA3i)

Starfall

Starfall.com, a free public service, ensures children from preschool through grade 3 learn to read in an atmosphere of fun and enthusiasm. Starfall is screen-reader- and switch-compatible. It is supported by memberships and school licenses available at a low cost.

[starfall.com](https://www.starfall.com)

TED-Ed

TED-Ed is TED's youth and education initiative with a mission to spark and celebrate the ideas of teachers and students around the world. TED-Ed includes a library of original animated videos and a platform for teachers to create their own interactive lessons, helping students bring TED to their schools and gain presentation literacy skills.

ed.ted.com

TED Talks

TED (Technology, Entertainment and Design) is a nonprofit devoted to spreading ideas, usually in the form of short, powerful talks (18 minutes or less). TED covers topics from science to business to global issues in more than 100 languages.

ted.com/talks

Texas School for the Blind and Visually Impaired

Texas School for the Blind and Visually Impaired (TSBVI) has an array of programs that serve students throughout Texas who are Blind, Visually Impaired, or DeafBlind. TSBVI provides online courses, resources, consultations, publications, and in-person training throughout Texas.

tsbvi.edu

Tobii Dynavox

Tobii Dynavox is a US-based developer, manufacturer, and distributor of speech-generating devices and technology and tools that allow items to be used through access methods such as switches and joysticks. Augmentative and alternative communication devices, adaptive games, and software are available. Dynavox offers communication apps, speech generating devices, eye trackers and eye-gaze-enabled devices.

- tobiidynavox.com/en-US/
- goboardmaker.com

Vispero

VFO™ Vispero offers assistive products and solutions to help individuals who are Blind/Visually Impaired (BVI) remain independent at home, at school, or in the workplace. Products are offered from Freedom Scientific, Enhanced Vision (Vispero), Optelec, and The Paciello Group. Vispero offers low-vision hardware with electronic magnifiers, hardware for people who are Blind, such as refreshable braille displays, and software solutions that include screen reading and magnification for individuals who are Blind or Visually Impaired. With the addition of The Paciello Group, Vispero also provides organizations with accessibility and compliance solutions.

- Freedom Scientific: freedomscientific.com
- Optelec: us.optelec.com
- Enhanced Vision (Vispero): enhancedvision.com
- The Paciello Group: paciellgroup.com
- Vispero: vispero.com

Ed.VoiceThread

Ed.VoiceThread is a platform on which students develop critical thinking, communication, collaboration, and creativity skills. VoiceThread is a cloud application, so there is no software to install. The only system requirement is an up-to-date version of Adobe Flash. VoiceThread will work in any modern web browser and on almost any internet connection. Upload and share and discuss documents, presentations, images, audio files, and videos. More than 50 different types of media can be used in a VoiceThread.

voicethread.com

Woz ED:

Woz ED is a model for incorporating computational thinking in the K-12 classroom and accelerating the path to employment for students who choose coding as a career. Students start with block-based code in kindergarten and transition to text-based code in middle school. Students may choose elective courses in their junior and senior year through concurrent enrollment with a nationally acclaimed coding school and complete the requirement for their certificate shortly after graduation.

wozed.com/stem/coding

YouTube

YouTube has many videos for people who are Blind or Visually Impaired and is recommended for secondary students, teachers, and parents. Some YouTube sites include The Blind Life, Blind to Billionaire, Becca's World, Well Eye Never, Perkins School for the Blind, National Library Service for the Blind and Physically Handicapped, Blind Grilling, ChattyChelby, and Tommy Edison Experience.

youtube.com

ZoomText

ZoomText is a screen magnifier for Microsoft Windows, developed by Ai Squared which was acquired by Freedom Scientific in 2016. ZoomText is available in two editions: ZoomText Magnifier and ZoomText Magnifier/Reader, which includes a built-in screen reader. It also offers Fusion.

zoomtext.com

Assistive Technology Tools and Applications Sample Listing

This is a sample listing of materials and equipment that can be selected for a classroom or student's toolkit. Assistive technology items will vary from student to student, and it is not implied that all are required for any individual. The various levels, from low-tech to high-tech, may be different depending on the age, cognitive level, and skill level of the student.

For example, the Taptilo may be considered high-tech for a pre-K student and medium-tech for a first grader or beginning braille user who needs more practice, jumbo dots, or has difficulty with an advanced electronic braille display.

The coding section also provides a listing of suggested items to try with students starting with pre-K.

Low Tech (may not require a connection to an electrical source):

- Alert indicators (i.e., liquid indicators)
- Alternative specialized paper (i.e, thermoform, tree-free paper, color line paper, Brailon, swell touch paper, braille paper)
- Braille labelers
- Darken pencils, neo-lite pens, mechanical pencils, markers, 20/20 pens, etc.
- Dark-line paper
- Raised-line paper
- Writing grip tool (i.e., The Arthwriter)
- Slate and stylus

- Writing guide
- Braille writer (manual and electronic)
- Braille books
- Large print books
- Headset/headphones/earbuds
- Handheld magnifiers
- Tactile/object/symbol kits (i.e., APH Tactile Connections)
- Tracking tools (i.e., E.Z.C. Readers, color overlays, reading strips, reading rulers, etc.)
- Stylus with different grips or handles
- 2–4 choice sequencing scanners
- Reading easels, tablet stands (positioning devices)
- Page turners
- APH equipment/material
- Various enabling devices (for students who are physically impaired)
- Tactile, braille, and visually enhanced manipulatives
- Low-tech refreshable braille cubes
- Adaptive measurement tools
- Abacus
- Adaptive time devices
- Math window
- Models and three-dimensional objects
- Keyboards: adaptive, extension, ergonomic
- Keyboard guides

- Leisure/recreation (card holders)
- Rechargeable and removable batteries
- Battery chargers
- Curriculum-support software/age-appropriate software
- Graphics production tools (i.e., APH tools)
- Communication devices (augmentative and alternative communication - work with speech therapist, basic word processing)
- Cause/effect switches

Intermediate Tech (may require batteries or connection to an electrical source):

- Apeman projector
- Age-appropriate apps
- Audio books
- Braille labelers (using recordings)
- Curriculum-support software/age-appropriate software
- Daisy digital players
- Digital recorders
- E-readers/digital readers
- E-reading software
- Electronic mobility aids
- Electronic watches
- Embossers
- Eye-gazing tech
- Graphic-production devices
- iBill Money Identifier device
- iOS and Android tablets
- Keyboarding software programs
- LCD monitors/displays
- Linear programming and talking calculators
- Microphones

- MP3 players
- Optical Character Recognition (OCR) apps
- Personal digital assistant (PDA): Orbit Reader, Braille Trail Reader LE
- PenFriend device
- Reading pens (C-Pen Reader)
- Reference tools (encyclopedia, dictionary, thesaurus)
- Scanners/scan-readers
- Screen readers
- Speech Recognition
- Speech-output devices
- Speech-to-text devices/applications
- Talking money identifiers
- Talking label wand/pen
- Talking reader, portable
- Taptilo – braille device
- Text-reading software (i.e., Clicker, Kurzweil 1000)
- Text-to-speech
- Tablet apps (cause and effect – intermediate level)
- Tablet pencil/pens
- Touch-screen tech
- Transcribing software (braille, braille music, etc.)
- Video magnifiers
- Video screen display (LCD)
- Wearable devices (eyewear, gesture/motion control)
- Word-processing applications

High Tech (generally requires an electrical source/batteries):

- Android (smart devices, electronic touch tablets)
- Apple iOS devices (smart devices; i.e., iPod, iPad, iTouch, iPhone)
- Age-appropriate apps
- BLITAB tactile tablet
- Closed-circuit television (CCTV)
- Curriculum support software/age-appropriate software
- Desktops, laptops (PC or Mac)
- Graphic-production devices
- Multimedia applications
- PDA: Apex, BrailleNote Touch Plus, BrailleSense
- Publishing and design applications
- Refreshable braille displays
- Spreadsheet applications
- Voice - digital assistants
- Video - digital cameras
- Web design applications

Keyboards and Accessories:

- Adaptive mouse, joysticks
- Appropriate cables, adapters
- Braille displays
- Ergonomic and adaptive keyboards
- Keyboard overlays
- Keycaps (large print/braille)
- MIDI keyboards (music)
- Power strips, surge protectors
- Switches
- Tactile locators

Storage Devices:

- DVDs/CDs
- Memory sticks
- External hard drives
- SanDisks (mini, micro, etc.)
- Thumb/flash drives

Furniture:

- Work with occupational therapist, physical therapist

Coding:

- Code Jumper (APH)
- Drones
- Educational Games (i.e., Osmo Coding Awbie Educational Game)
- Robots
- Swift Playgrounds (Apple)

Coding Suggested Resources:

- [Apple Education: Teaching Code](https://apple.com/education/teaching-code) (apple.com/education/teaching-code)
- [Apple: Swift Playgrounds](https://apple.com/swift/playgrounds) (apple.com/swift/playgrounds)
- [Woz ED: Coding](https://wozed.com/stem/coding) (wozed.com/stem/coding)
- [Hour of Code Activities](https://hourofcode.com/us/learn) (hourofcode.com/us/learn)

*Please check into any equipment release/loan forms required for borrowing equipment. Some of the items listed above may be borrowed from [MDE-LIO's Assistive Technology Library](https://bit.ly/ATLibrary/LIO) (bit.ly/ATLibrary/LIO) or [Alt+Shift's Lending Library](https://altshift.education/lending-library) (altshift.education/lending-library).

Assistive Technology Tools Record Keeping Chart Instructions

The Assistive Technology Tool Table can be used to keep track of the student's tools. This is a simple checklist to use to collect data of any tools the student has tried. The checklist can also be used to keep track of the student's toolkit. There is added space in each category to add tools not listed. Some examples of ways to collect student tools data are:

- Record the date to document the year of acquisition.
- Record the grade and check the space next to the tool.
- Record the date and grade when the tool has been discontinued.

Example:

Low Tech

Technology	Pre-K	Elementary	Middle School	High School
Alert Indicators	X 9-13	X 9-14	Discontinued 9-19	
Specialized Paper				
Braille Labelers				

Assistive Technology Tools Record Keeping Chart

Student Details

Student Name:

Teacher Name:

Low Technology (may not require a connection to an electrical source)

Technology	Pre-K	Elementary	Middle School	High School
Alert Indicators				
Specialized Paper				
Braille Labelers				
Darken Pencils				
Neo-Lite Pens				
Mechanical Pens/Pencils				
Markers/20/20				
Dark- or Raised-Line Paper				
Writing Grips				
Slate and Stylus				

Technology	Pre-K	Elementary	Middle School	High School
Braille Writer				
Writing Guide				
Large Print Books				
Braille Books				
Cause/Effect Toys, Switches				
APH Materials for LightBox				
APH Tactile Materials (age level specific)				
Tactile Graphics Tools				
Headset/phones, earbuds				
Handheld magnifiers				
Microphones				
Stylus				
Easels/Stand				
Page Turners				
Abacus				
Math Window				
Keyboard				
Switches				

Technology	Pre-K	Elementary	Middle School	High School

Intermediate Tech (may require batteries or connection to an electrical source):

Technology	Pre-K	Elementary	Middle School	High School
Projector				
Audio Books				
Digital Recorders				
E-Readers				
Embossers				
Eye-Gaze Tech				
Tablets				
Keyboards				
Monitors				
PDA				

Technology	Pre-K	Elementary	Middle School	High School
Recording/Reading Pens				
Scanners				
Speech Recognition				
Taptilo				
Tactile Graphics				
Tactile Toolkit				
(Attainment)				
Touch Screens				
Transcription Software				
Video Magnifiers				
Wearable Devices				
Word Processing				

High Tech: (generally requires an electrical source/batteries):

Technology	Pre-K	Elementary	Middle School	High School
Android Devices				
iOS Devices				
BLITAB				
CCTV				
Computers/laptops				
PDA				
Refreshable Braille Display				
Storage Device				

Coding

Technology	Pre-K	Elementary	Middle School	High School