

Assistive Technology for the Mac



Training Materials

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Overview

This module is designed to give teachers an overview of assistive technologies available for use with a Macintosh computer. A number of assistive technologies are available to help students with special needs and support their ability to access the curriculum.

Objectives

- To provide an overview and definition of assistive technology.
- To provide an overview of assistive technologies available for use with students with special needs.

Prerequisites

Teachers should be familiar with the fundamentals of using a Macintosh computer, including navigation, file management, and using discs. It is also useful to have an understanding of the operating system, software installation, and adjusting computer preferences and control panels.

Glossary

The following terms and definitions are useful to know for this module:

Alternative keyboard

Any alternative to the standard keyboard for input into the computer.

Assistive technology device

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 functional capabilities of a child with a disability.

Assistive technology service

Any service that directly assists a child with a disability in the selection, acquisition, or use of an assistive technology device.

Control panels

A series of controllable programs running within the computer's operating system. Control Panels can be accessed through the Apple menu.

Default setting

The standard set up for a device or software program.

FM system

Assistive listening device which is frequency modulated.

IEP

An Individual Education Plan developed for a student enrolled in special education.

Input/Output

Communication between a computer and its users; getting information into the computer and out of the computer.

Least restrictive environment/manner

The most normal and least burdensome manner possible.

Math formatting software

Software designed to assist students through the process of solving math computation problems.

Modality preference

A student preferring one learning modality, such as auditory, visual or kinesthetic, over another for learning.

Mouse alternatives

Any alternative to the standard mouse for input into the computer, such as switches and joy-sticks.

Operating system

The software that runs the computer.

Overlay

A sheet of plastic laid over a keyboard, or alternative keyboard, to assist in its operation.

Port

A hole in the computer used to plug in a device and for information to go into the computer or out of the computer.

Portable word processor

An inexpensive portable machine that does word processing but is not a full computer.

QWERTY

The traditional configuration of computer keyboard keys.

Scrolling

To cause displayed text or graphics to move across the screen.

Speech synthesis

Computers that generate human-like speech.

Stylus

A pointed instrument used as an input device on a pressure-sensitive screen.

Switch

An easy-to-push button, plugged into the computer, used as an alternative to a keyboard and mouse.

System extension

Software installed on the computer which enables the computer to do additional tasks.

Talking word processor

A word processing program with speech synthesis that enables it to "read" text aloud.

Touch screen

A screen that can detect and respond to something, such as a finger or a stylus, pressing on it.

Track ball

A pointing device consisting of a ball housed in a socket used as an alternative to a mouse.

Voice recognition

The identification of spoken words by a computer.

Word prediction

Software that will guess what the student wants to write based on the initial letters typed.

Assistive Technology - Concepts and Definitions

Before looking at assistive technology supports for students it is useful to review some fundamental concepts and definitions of assistive technology.

What Is Assistive Technology?

According to the Individuals with Disabilities Education Act (IDEA), assistive technology is any technology device provided for a student that supports the student's ability to have access to the general education curriculum in the least restrictive environment possible. It is used to increase, maintain, or improve the functional capabilities of a child with a disability in the areas of motor skills, vision, hearing, and speech.

The legal definition of assistive technology is broad based and can include low-no tech options for students such as pencil grips, slant boards, picture boards, and Braille books to support performance in the functional skill areas.

When higher level technologies are used, performance can also be enhanced through modifications to computers, computer operation, and computer input and output. Supports for the manual effort required to operate a computer and for processing visual and auditory input/output can be implemented.

Modifications can be internal and built into the operating systems of computers or they can be in the form of peripheral devices or specialized software.

Why Use Assistive Technology?

There are a number of compelling reasons to use assistive technology. Certainly a primary reason is to empower students with special needs and enable them to access the curriculum within the least restrictive environment possible.

Another reason to use assistive technology is to maximize a student's ability to function as independently as possible in the educational environment.

Implementing Assistive Technology

Every student has unique needs. Assistive technology that is useful to one student may not be useful to another. Similarly, one type of assistive technology may be useful to people with very distinct disabilities. For example, a talking word processor may be useful to a visually impaired student as well as a learning disabled student.

You have students in your class with a variety of abilities, disabilities, and a variety of learning modality preferences. The assistive technology devices and software programs described within this document are resources that are available to you and your students. It is important to facilitate an appropriate match between the needs of your students and the appropriate assistive technology tools. Assistive technology needs are determined at least in part by site or district personnel knowledgeable about motor, vision, hearing, and communication skills in relation to the classroom curriculum goals.

Apple's Universal Access Tools and the Mac OS

Apple provides assistive technology built right into your Mac's operating system. Apple calls its array of built-in assistive technology software "Universal Access" tools. These tools improve access to and use of Macintosh computers.

The Universal Access tools are accessed through various system control panels, including:

- CloseView
- Easy Access
- Speech

If these control panels are not installed on your iMac, you can install them from the LAUSD restore CD or download them from Apple's web site. Let's examine each of these control panels and their features in detail.

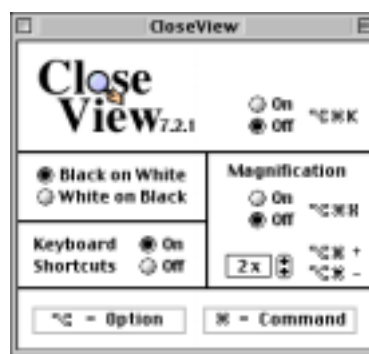
Close View Control Panel

CloseView is a screen magnifier. You can increase the magnification of whatever is onscreen up to 16 times their original size. Think of it as looking at your computer screen through a magnifying glass. This feature would be used most often by students with visual impairments.

Use Close View

Follow these steps to open and use the Close View control panel:

1. From the Apple menu, select Control Panels then the CloseView control panel. The Close View control panel opens.



Close View Control Panel

2. In the top pane, click On to activate Close View. You'll immediately notice a black rectangle on the screen. The area inside the rectangle will be magnified once the magnification is turned on.
3. Click White-on-Black to reverse to white letters on a black background. Sometimes it's easier for a person with a visual impairment to see white-on-black rather than black-on-white.
4. In the Magnification pane, click the up or down arrows to select the degree of magnification. You'll notice the black rectangle growing and shrinking as you decide which magnification you want.

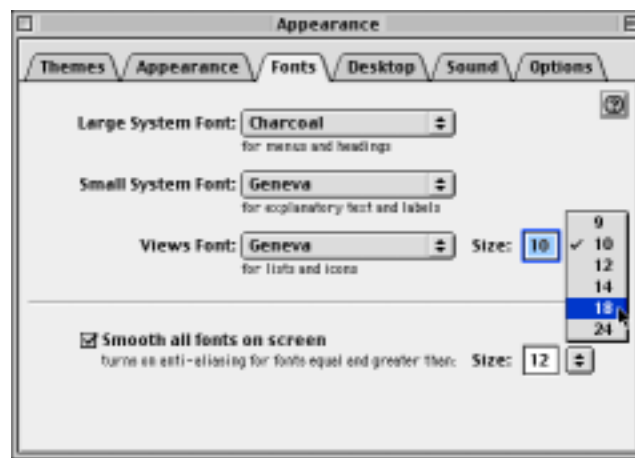
5. After selecting your desired level of magnification, click On in the Magnification box to activate the magnification. You can modify the level of magnification while it is active.
6. To turn the magnification off, either click Off in the Magnification pane or press Command-option-X simultaneously. To turn CloseView off and completely remove the magnification rectangle, click Off in the top Close View pane or press Command-Option-O simultaneously.
7. Close the Close View control panel.

Enlarging Font Size Using the Appearance Control Panel

While not technically part of Apple's UniversalAccess package, the Appearance control panel can provide a measure of support for students who have trouble seeing small font sizes on the computer's folders and window title bars. The Appearance control panel allows you to set the system font size larger for easier viewing.

Change the System Font Size for Folders and Window Title Bars

1. From the Apple menu, select Control Panels then open Appearance. The Appearance control panel opens.



Appearance Control Panel with 18 pt. Font Being Selected

2. Click the Fonts tab and enlarge the font size up to 24 points. Select an alternate Large System font if desired.
3. The computer converts folder labels and window titles to your selected font size.



Selected Folder with 18 pt. Font Active

4. Close the Appearance control panel.

Easy Access Control Panel

Easy Access is a control panel extension with a set of keyboard utilities including Mouse Keys, Slow Keys, and Sticky Keys. These programs provide modifications to keyboard entry and mouse use and are designed for people who have difficulties using the keyboard or the mouse.



Easy Access Control Panel

For all three programs in the Easy Access control panel, you may select to use On/Off audio feedback by selecting the checkbox at the top of the control panel.

Mouse Keys

MouseKeys lets a student control onscreen pointer movements by typing on the numeric keypad. This feature is useful for those who lack the manual dexterity to maneuver a mouse.

1. Activate Mouse Keys by clicking On in the Mouse Keys pane or by pressing Command-Shift-Clear at the same time.
2. Modify the delay time before the pointer begins moving onscreen from long to short by clicking the appropriate radio button.
3. Modify the speed at which the pointer moves across the screen as well.

Slow Keys

Slow Keys allows you to modify the length of time it takes for a keystroke to be registered. This feature can be useful for students whose level of motor control may require a shorter or longer delay in keystroke registration timing than the standard keyboard registration delay setting.

1. Click On in the Slow Keys pane to Activate Slow Keys.
2. Change the Acceptance Delay setting from a long delay to a short delay by selecting the appropriate radio button. A longer delay setting increases the time it takes for a keystroke to register when the key is depressed.

Sticky Keys

Sticky Keys is a software-based keylatch, that is, it provides a way for people who type with one finger or with a mouth wand to execute multi-key keyboard commands, such as capitalizing a letter, or keyboard shortcuts. To see how Sticky Keys allows a student to type a capital letter, follow these steps:

1. In the Easy Access control panel, activate Sticky Keys by clicking On in the Sticky Keys pane or by pressing the Shift key five times.
2. You'll hear a sound effect and see a small icon of an empty bucket appears at the far right side of the menu bar, which indicates that Sticky Keys is activated.
3. Type a capital letter using Sticky Keys by taking one finger and pressing the Shift key once. This locks the Shift key you just pressed. The next letter you press will be capitalized.

Speech Recognition and Speech Synthesis on the Mac

Apple has created speech recognition and speech synthesis technologies to use within the Mac OS. These capabilities allow the computer to respond to voice commands and to read or speak onscreen text to the user. This functionality is useful to students with a range of challenges.



Speech Recognition and Speech Synthesis

English Text-To-Speech and Mexican Spanish Text-To-Speech

English Text-To-Speech is a feature which when installed converts onscreen text to spoken English words. It is used in OS 9 system functions, including the enabling of the Speech control panel and other software programs such as talking word processors. Mexican Spanish Text-to-Speech offers all the same features of English Text-to-Speech, but in Spanish with a Mexican Spanish accent.

Speech Control Panel

The Speech control panel offers a number of features that allow students to interact with the computer using voice commands and listening to spoken onscreen text.

Talking Alerts

Apple's speech synthesis powers Talking Alerts, a feature that speaks the contents of any alert message that appears on your computer screen. To activate Talking Alerts, follow these steps:

1. From the Apple menu, select Control Panels then Speech.
2. At the top of the control panel, select Talking Alerts from the Options pop-up menu.



Talking Alerts Selected from the Options Pop-up Menu

3. Select the Speak the phrase: checkbox and your preference for phrase from the corresponding pop-up menu. This phrase is spoken just before an alert message is read. The Next in the list and Random from the list options provide the most variety. Edit the contents of this list by selecting Edit Phrase List.




Speak the phrase: Pop-up Menu with Next in the List Selected

4. Select the Speak the alert text checkbox to have any alert message be spoken when it appears onscreen.
5. Select the delay before the alert message is spoken by moving the Wait before speaking: slider.



Speech Control Panel with All Talking Alerts Settings Selected

6. With these settings made, click the Talking Alerts test button  to hear a sample alert.
7. If desired, select an alternate voice for reading the alert messages. Select Voice from the Options pop-up menu. The Voice options appear.
8. Select a voice from the pop-up Voice menu. Click the test button to hear a sample of the voice. Adjust the speech rate of the voice as desired.

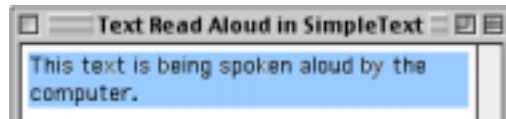


Speech Control Panel with Voice Options Window Selected

Speech Synthesis in Other Applications

Other applications use speech synthesis technology to speak responses or the onscreen content to the user. SimpleText, Apple's basic text editor included with the Mac OS, is a sample of such a program. To see how Simple Text uses speech synthesis technology, follow these steps:

1. Open SimpleText from the hard drive.
2. In the New Document window, type a sentence.
3. Select the sentence by triple-clicking it or by pressing and dragging through it.



Highlighted Text in SimpleText

4. From the Sound menu, select Speak Selection. The computer speaks the contents of the highlighted sentence.



Speak Selection Command in the SimpleText Sound Menu

Speakable Items

Speakable Items is another program available in the Speech control panel that allows a student to speak commands to the computer. They can speak commands which the computer then executes, including closing windows, opening applications and folders, and telling what the time is. Visually impaired students or students with learning disabilities can use the Speakable Items software to operate the Macintosh. To use Speakable Items, follow these steps:

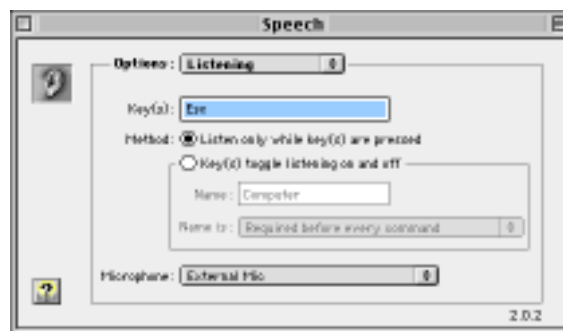
1. Make sure Speech Recognition software has been installed from the OS 9 install CD. If it has, the Speech Recognition extension appears in the Extensions folder inside the System folder. If necessary, install this software using a custom installation.
2. Open the Speech control panel.

3. Select Speakable Items from the Options pop-up menu.
4. Click On to activate Speakable Items.
5. The Feedback window will appear letting you know Speakable Items is ready. This window contains a cartoon character and a text transcript of what is spoken by both the computer and the user.



Speakable Items Feedback Window

6. Adjust Listening settings as necessary. In the Speech control panel, select Listening from the Options pop-up menu. Select a key and method to use when speaking commands. Select the appropriate mic input option.



Listening Options, Speech Control Panel

7. A Speakable Items folder containing all the items the computer can recognize appears in the Apple Menu. Test Speakable Items by asking the computer, "Tell me a joke," or "What time is it?"
8. A student can add an item to the Speakable Items folder by selecting an item, such as a new folder, file, or application and saying "Make this speakable." The item can then be opened and closed with speakable commands.
9. For additional info on Speakable Items, consult Mac Help.

Apple's UniversalAccess features go a long way toward making the computer-using experience more accessible to all learners.

Assistive Technology Hardware

Assistive technology strategies sometimes depend solely on hardware or software. Other times the combination of hardware and software is critical to success for the user. In any case, to use the computer input is critical. In this section, we will explore some examples of AT hardware solutions.

Mouse Alternatives

For students who have difficulty using a standard mouse and for whom the Easy Access feature is not appropriate, a number of extended and alternative mouse options are available. Many mice are plug-and-play and require no further software installation. Others require installing additional software, including those that are programmable.

Kensington Mouse in a Box with Scroll Wheel

The scroll wheel on a mouse can make scrolling easier for students who have difficulty with the fine motor control needed for traditional point-and-click or point-and-drag scrolling.



Kensington Mouse in a Box with Scroll Wheel

Kensington Track Ball

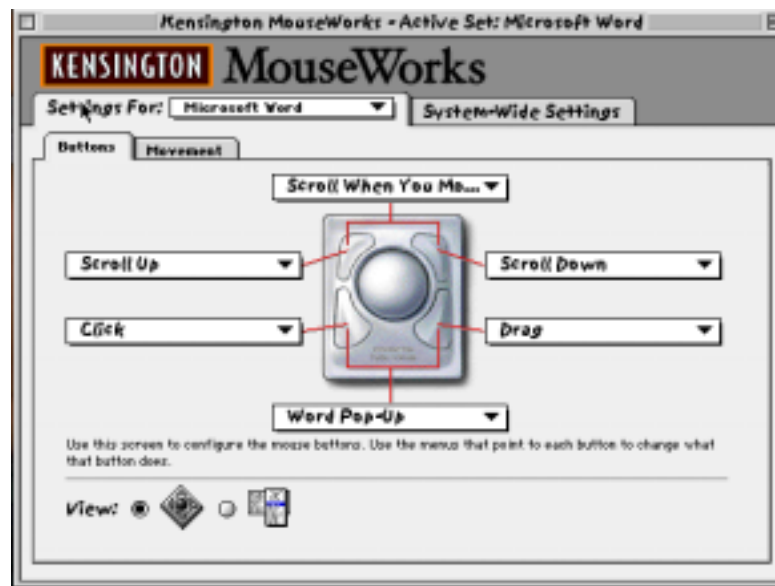
Track balls make maneuvering the mouse easier. Instead of moving a mouse around to move the onscreen pointer, the student rolls a ball sitting in a socket. The Kensington track ball comes with multiple programmable buttons. Because these buttons can be programmed to execute frequent tasks or multi-step commands, they reduce the effort required to use the computer.



Kensington TurboMouse Track Ball

Kensington MouseWorks Software

MouseWorks software allows you to program either the Kensington mouse with scroll wheel or the track ball. Buttons on either device can be programmed to click, double-click, drag, scroll, and execute many other commands.



Kensington MouseWorks Software Window

Joystick Plus

A joystick can be a good alternative to the mouse for a student who needs some additional assistance in operating a mouse. The joystick can be more easily maneuvered than a mouse. The Joystick Plus has additional keys on the deck of the device that allow a student to temporarily lock the direction of the arrow when a steady motion is difficult. One key is a latchkey, that is, a key that with one finger can act as if you are holding down the Shift key, while other buttons are used to scroll and drag.



Joystick Plus

HeadMouse

The HeadMouse sensor is a mouse alternative for people who cannot use their hands. It is a non-restrictive head-mounted and head-controlled wireless device. The HeadMouse translates the movements of a student's head into directly proportional movements of the onscreen pointer. The HeadMouse uses an optical sensor that tracks a tiny and disposable target that is placed on the student's forehead.

Alternative Keyboards

Alternatives to the standard keyboard are important supports for students with certain challenges. Alternative keyboards are helpful for students with motor control impairments or students with learning disabilities. Students with small hands, only one hand, or limited use of the hands can also benefit from alternative keyboards.

IntelliKeys

Sometimes a person's level of motor control prohibits use of a standard keyboard. A student may require a larger surface area to touch or variations in the pressure required to register a keystroke. IntelliKeys provides such a solution.



IntelliKeys Large Format Keyboard

IntelliKeys is an alternative keyboard that is used with bar coded overlays and will work with any software program. IntelliKeys has a variety of access settings and two switch ports to meet the needs of people with physical disabilities.

No software installation is necessary to use IntelliKeys. Just plug the IntelliKeys cable into your computer's ADB or serial keyboard port. You can however use the Keyboard control panel to adjust the key repeat rate and delay before repeat to match the rate at which a particular student can operate this keyboard.

IntelliKeys Overlays

Intellikeys uses a number of overlays and provides the ability for you to create, customize, and print out your own overlays using another IntelliTools product, Overlay Maker.

IntelliKeys Setup Overlay

With the Setup Overlay, you can customize the way in which IntelliKeys responds to your key presses. The Keyboard Reset returns features on IntelliKeys to their original default settings. We recommend resetting IntelliKeys to its original settings before using it with a new student.

1. Put the Setup Overlay onto IntelliKeys.
2. Press Keyboard Reset twice.
3. IntelliKeys is now set to its default settings.
4. Take the Setup Overlay off.

IntelliKeys Alphabet Overlay

The Alphabet Overlay is arranged in alphabetical order with large, easy-to-read keys.

1. Open your word processor. (Note: IntelliKeys will work with any software program, such as Microsoft Word).
2. Slide the Alphabet Overlay onto IntelliKeys. IntelliKeys will beep to indicate that the overlay is ready to use.
3. Press one of the letters on the overlay and hold it down for a few seconds without releasing.
4. Open the Keyboard control panel, set the Keyboard Repeat rate to slow, and set the Delay until Repeat to Off. Close the Keyboard control panel.
5. Now press and hold down one of the letters again. The key will not repeat unless you lift up your finger and press down again.

IntelliKeys Numbers Overlay

This numeric overlay can be used for math and other number-intensive areas of study.

IntelliKeys Basic Writing Overlay

The Basic Writing Overlay is arranged in alphabetical order and includes numbers.

1. Slide the Basic Writing Overlay onto IntelliKeys. IntelliKeys will beep to indicate that the overlay is ready to use.
2. Type some words using this overlay.
3. Save your document by pressing the Alt key. Now press the letter S. Notice that IntelliKeys supports sequential key commands so a user does not have to press two keys at once.

Smart Typing

Smart Typing can help if the keyboard user types at a very slow rate. Smart Typing automatically types certain characters to make typing faster.

- With Smart Typing on, when you type an upper or lower case "q", IntelliKeys automatically adds a lowercase "u".
- With Smart Typing on, when you type a period, exclamation point, or question mark, it automatically adds a space and a Shift key so that the next character typed will be uppercase to begin the next sentence.

Slowing Down the Response Rate

The Response Rate feature is used to adjust the time required to activate a key. If a student tends to press unwanted keys on the way to selecting the desired key, you can try changing the Response Rate so the unwanted keys will not activate.

1. Think of a letter you would like to type. Slowly drag your finger across the keyboard on the way to that letter. Usually, many unwanted characters are typed.
2. To change the Response Rate, remove the Basic Writing Overlay and place the Setup Overlay onto IntelliKeys.
3. Press the Response Rate key. On the Setup Overlay Number Pad, press the number 10. 15 is the default setting.

1 = Slow Response Rate
15 = Rapid Response Rate

4. Put the Basic Writing Overlay onto IntelliKeys.
5. Slowly drag your finger across the keyboard. When you find the letter you want, let your hand remain on that letter until the key is activated.
6. You can use the Setup Overlay again to set the Response Rate back to 15.

IntelliKeys Arrows Overlay

The Arrows Overlay can be used with software programs that primarily require the use of arrows for navigation and input.

1. Put the Arrows Overlay onto IntelliKeys.
2. Use the arrow keys to move within your word processing document.

Mouse Pad on the QWERTY Overlay

The built-in mouse pad on the QWERTY Overlay lets a student move the mouse in eight directions. Particular letters on the keyboard also represent the different mouse arrow directions. The mouse pad centers on the letter K (which acts as a single mouse click).

Mouse Arrows for the Elementary Overlays

IntelliKeys enables a student to combine the functions of a keyboard and a mouse with the touch of a finger. Mouse Arrows can be activated for any of the four Elementary Overlays: Alphabet Overlay, Basic Writing Overlay, Numbers Overlay, and Arrows Overlay.

1. To activate Mouse Arrows, place the Setup overlay onto IntelliKeys.
2. Turn Mouse Arrows On.
3. Put the Arrows Overlay onto IntelliKeys. Notice that the mouse indicator light turns on. Use the arrows to navigate around your computer desktop.
4. When you press the Mouse key to begin, the mouse indicator light turns on indicating the four arrow keys will become Mouse Arrows. A student can use the four arrow keys to move the mouse pointer in four directions.
5. Press the Keyboard key to make the IntelliKeys a standard keyboard again.
6. You can alternate between mouse and keyboard as often as you like.
7. A student can type with only one finger. To type a capital letter press the shift key. The shift key remains active while you lift your finger to choose the letter you want to capitalize.
8. IntelliKeys beeps to indicate that the overlay is ready to use.

Little Fingers

For children, and some adults, access to the computer through a standard keyboard is an issue of size. A standard keyboard is too large. Their hands aren't as big as an adult's and they cannot comfortably reach across the keyboard. The Little Fingers keyboard is about 80 percent of the standard keyboard size. It also has an integrated trackball.



Little Fingers Keyboard

BAT One Handed Keyboard

For a student with the use of one hand only, the BAT One Handed Keyboard is a useful alternative. This alternative keyboard will perform all the standard keyboard functions. This keyboard uses a chording system to execute a large number of commands.



BAT One Handed Keyboard

AlphaSmart 3000 Portable Word Processor

The AlphaSmart provides the power of a word processor, including a spell checker, and can be carried from class to class, to home, and back to school. This portability allows students to take notes in class and take the device home to have extra time to type their work. The keyboard can be modified in a variety of ways, including a set up for one-handed use.



AlphaSmart 3000 Portable Word Processor

- The AlphaSmart requires no software installation.
- Any file a student creates can be downloaded into any computer program by plugging the computer's keyboard cable into the AlphaSmart Computer port and pressing the Send button.
- Through the Printer port, a student can print a file (notes or final draft) straight to a printer.

Braille Keyboard Overlays

For visually impaired students, a Braille keyboard overlay is an obvious alternative to using the standard keyboard alone.

EKEG Mini-Keyboard

The EKEG Mini-Keyboard was created for the physically impaired. The keyboard's flat, smooth waterproof plastic cover can be removed for easy cleaning or to allow for the use of overlays.

You can adjust the time required for a keystroke to be entered and the delay time before a pressed key repeats, that is, registers another keystroke.

1. With the feature called "delay to accept", a student can glide his or her hand or a stylus over the keyboard and the key is not entered until he or she pauses on the desired key for a preset amount of time.
2. After the key is entered, a click is generated and a light flashes. This feature can greatly increase a student's typing speed and reduces fatigue.
3. A speaker can be plugged into the built-in jack on the keyboard so the click sound can be amplified for a noisy environment or for the hearing impaired.
4. No additional software is needed.



Mini-keyboard

TouchWindow

TouchWindow is a touch screen that attaches to the computer monitor and is used as a mouse alternative with the touch of a finger on the screen. The TouchWindow is good for students with developmental or physical disabilities who have trouble manipulating the mouse and can also be effective with preschoolers and early learners.

Switches

Switches are used by students with severe disabilities, whose limitations prevent them from using more traditional input devices, such as the mouse or keyboard. Using switches, students can operate the computer without the use of their hands. Use of switches can vary from a simple "click" to carrying out all the complex commands necessary for word processing or painting. Switches range from being easily activated with small amounts of pressure, to very rugged switches designed to withstand significant amounts of pressure. Some extremely sensitive switches are activated by sound; others are controlled by small-muscle movement, such as that of the forehead, cheek, or even the blinking of an eye. This section covers two switch options.

Discover:Switch

The Discover:Switch provides a switch and an onscreen keyboard that through automatic scanning provides access to all standard keyboard and mouse functions. When using the Discover:Switch, the regular keyboard and mouse continue to work for others and all the programs run normally.

Plugging In the Discover:Switch

1. Turn the computer off.
2. Unplug the keyboard from the back of the computer.

3. Plug in the free end of the Discover:Switch cable where the keyboard cable was.
4. Plug the keyboard cable into the extension outlet on the Discover:Switch cable.
5. On the side of your Discover:Switch, there is an ON/OFF button. Slide it to the ON position.

Installing the Discover:Switch Software

1. Startup your computer with extensions off by holding down the Shift key while your computer starts up.
2. Be prepared to enter the 11-digit serial number located on your program disk.
3. When the computer completes its startup, insert the Discover:Switch CD.
4. Double-click the Installer, then follow the onscreen instructions. When installation is complete, the computer automatically restarts.

Using the Discover:Switch Scanning Process with a Word Processor

The following sequence describes the process for using the Discover:Switch within a word processing program.

1. After restarting your computer, open a word processor, Microsoft Word, for example.
2. Press the switch and an onscreen keyboard appears.
3. A scanning highlighter begins to automatically move through the rows of the onscreen keyboard.
4. Press the switch again when the row you want is highlighted.
5. Next, groups within the row are scanned. Press the Discover:Switch when the group you want is highlighted.
6. Lastly, the individual keys within the selected group are scanned. Press the switch when the key you want is highlighted.
7. To get capital letters, the Shift key works as a latchkey and stays pressed until you select a letter.

Discover:Switch Setup Files

The Discover:Switch software includes setup files with different onscreen display options. When starting up a program, a student can choose the display option that best meets their needs.

Jelly Bean Switch

The Jelly Bean Switch is an example of a small switch that takes less than 2 oz. pressure to activate. It can be used by itself or in conjunction with the Discover:Switch. To add functionality to the Discover:Switch, plug the Jelly Bean switch into one of the ports in the side of the Discover:Switch. The second switch can aid in such actions as dragging, normally done with a simultaneous mouse click and drag or track ball roll.



Jelly Bean Switch

Headsets

Sometimes simply using a pair of audio headsets can help focus the sound signal or voice synthesis from the computer to assist students with hearing loss, as an alternative for students with visual impairments or for students with learning disabilities who benefit from auditory reinforcement of visual information.



Headset

FM System

An FM system is a type of assistive listening device which is used as an alternative to hearing aids in the classroom. The system is a frequency modulated transmitter and receiver. The settings are set by an audiologist to configure to a student's hearing profile. In some cases, these systems can be jacked into the auditory port of a computer to facilitate listening to a computer by a student who is hearing impaired. Please consult with a hearing specialist before attempting to do this.

Assistive Technology Software

Whether a computer is being operated with standard or alternative input devices, much assistive technology support is provided by software. This section covers several useful software programs for learners with special needs.

Word Prediction Software and Talking Word Processors

Word prediction is similar to a pre spell checker. It was originally developed for physically impaired students who have trouble typing, but it is also very useful to students with learning disabilities. A student writes the first letter, or letters, of the word and the program gives the student a list of words to choose from that may be the correct word.

Co:Writer and Write:OutLoud

Co:Writer is word prediction software designed to be used along with a word processing program. The dictionaries of words grow with each particular student as the program learns that student's personal vocabulary. Co:Writer has built-in voice synthesis, speaking words out loud so a student can hear the options, not just see them. Co:Writer works very well with Write:OutLoud.



Co:Writer Software Package

Write:OutLoud.

Write:OutLoud is a word processor that features voice synthesis to allow students to hear what they have written as an aid in composing/editing or for the visually impaired.



Write:OutLoud Software Package

Open Co:Writer

1. Locate and open the Co:Writer application on your hard drive.

2. At the Who's Writing screen, type in the student's name.
3. At the Writing Level screen, select the writing level of the student. If you choose too high a level, the program will offer words that are out of the student's vocabulary range. If you choose too low a level, an insufficient number of words will be offered for the student to choose from.
4. Select the **Discover** check box, if you want to use Co:Writer with the Discover:Switch.

Use Co:Writer with Write:OutLoud

1. At the Choose an application prompt, open Write:OutLoud to use with Co:Writer. Write:OutLoud opens a new document.
2. Press the wake up key (the default is the + / = key) to bring Co:Writer to the foreground.
3. Type the first letter of the first word you want to write. Co:Writer offers a list of guesses that match the letter you typed. When the Flexible Spelling option is on, Co:Writer lists word choices phonetically as well.
4. Co:Writer speaks the word and moves it into the sentence.
5. Next, Co:Writer tries to guess what your next word *might* be, based on grammar and sentence structure, before you even type any letters. When you get to a place in a sentence where a verb, for instance, belongs, Co:Writer offers verbs in the word list. This feature is called Predict Ahead.
6. Normally personal and proper names are not likely to be included in Co:Writer's main dictionaries. But Co:Writer will collect the names you use after you type them once. You can set Co:Writer to use these collected words when predicting.
7. At the end of a sentence when you type the final punctuation (for example, period, question mark, or exclamation point), Co:Writer opens the connected word processing program, Write:OutLoud, and types the sentence wherever the cursor is in the document.
8. Co:Writer wakes up automatically when you begin typing again.

Editing in Write:OutLoud

Three voice synthesis features within Write:OutLoud are designed to help students edit their work.

1. The program reads back words, sentences or paragraphs. Press the speaker button and listen to determine whether what you have written is what you meant to write. Edit where necessary.
2. The speaking spell checker can help avoid using words that are spelled correctly but are not the correct word.

3. To further help a student to know if a word is correct and not simply correctly spelled, the talking dictionary reads out loud, not only the word in question, but its definition as well.

IntelliTalk II

Like Write:OutLoud, IntelliTalk II is a talking word processor with talking spell check. It also includes talking graphics (clip art) to assist developing writers. To increase access for physically impaired students, IntelliTalk II can easily be used with switches. Built-in scanning and automatic overlay generation provide access through the IntelliKeys alternative keyboard as well.



IntelliTalk II Software Package

Creating a New Document and Choosing Input Mode and File Type

IntelliTalk II comes with templates designed for IntelliKeys users, switch users, and standard keyboard users. These input modes can be chosen when creating a new document. IntelliTalk II lets a student choose between Advanced Keyboard Typist and Basic Keyboard Typist. The Advanced Keyboard Typist is actually easier to use for beginning writers.

Choosing an IntelliKeys Overlay from Within IntelliTalk II

IntelliTalk makes it easy to choose an IntelliKeys overlay. To do so, click the IntelliKeys menu and choose the overlay best suited for the student's needs.

Using Talking Pictures

For developing writers, communicating with graphic images can be very useful especially when those images speak their names. IntelliTalk contains a clip art gallery with talking pictures for this purpose.

1. From the Edit menu, select Picture Library.
2. Choose an image to insert.

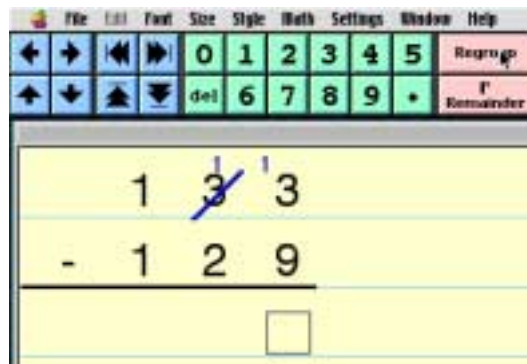
Math Formatting Software

MathPad and Access to Math support students in math computation with talking math problems accessible through switches and IntelliKeys. These programs offer students guidance (scaffolding) in the process of working through a math problem with voice synthesis for auditory reinforcement.

Math Pad

Math Pad is designed to be used with IntelliKeys (or with the standard keyboard) to help students through the process of solving math computation problems with a minimum of key strokes and in the correct order.

- Teachers can easily make worksheets for student use and students are guided step-by-step through the problem.
- Use the Overlays menu to work easily with Intellikeys.
- The Regroup button guides students through the carrying process.

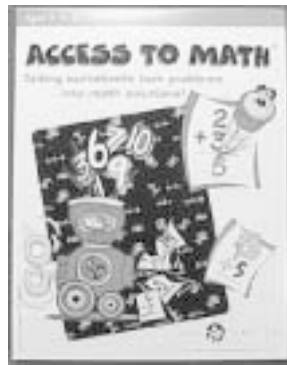


Regroup Button Used in Carrying Process

Access to Math

Access to Math has many of the same features as Math Pad, including auditory feedback, ease of use with IntelliKeys, and easy to make teacher worksheets. It also has a navigation bar with the following features:

- Steps students through the worksheet problems.
- Reads the problems aloud.
- Reads the answers aloud.
- Checks the students answers for accuracy and prompts the student if he or she needs to keep working any particular problem.
- Turns on Regrouping to assist a student in carrying.
- Changes the colors of the problems for easier viewing.



Access To Math Software Package

outSPOKEN

outSPOKEN is a third-party control panel system extension available from ALVA Access Group. outSPOKEN allows blind and visually impaired students to navigate the computer screen with the use of keyboard and/or braille display commands. As a student moves the cursor across the computer screen, outSPOKEN reads any text and or icons it encounters.

1. To download outSPOKEN, go to <http://www.aagi.com/aagi/osw09.html>
2. After you install it, turn outSPOKEN on by opening the outSPOKEN control panel and clicking the ON button.

Closing Thoughts

This module has provided an introduction to some of the assistive technology tools available to support your student learners with special needs. These tools may be useful to a range of students with a variety of disabilities. Most of these tools, whether hardware or software, are not difficult to implement.

Technology supports can go a long way toward promoting better access to the curriculum for all students.

Resources

A list of linked web resources can be found on the [Assistive Technology Resources](#) page.