



Accessibility

A Guide for Educators

Empower students with accessible technology
that enables personalized learning

Accessibility: A Guide for Educators

*Empower students with accessible technology
that enables personalized learning*

Revision 4: Windows 8, Office 2013, Internet Explorer 10, Office 365, Lync 2013, Kinect for Xbox 360, and Kinect for Windows

Published by Microsoft Corporation
Trustworthy Computing
One Microsoft Way
Redmond, Washington 98052-6399

Managing editors: Carla Hurd, Microsoft Education; and, Dan Hubbell, Trustworthy Computing, Accessibility Outreach

Edition 4: Revised and published in 2013

This document is provided “as-is.” Information and views expressed in this document, including URLs and other Internet website references, may change without notice.

This document does not provide you with any legal rights to any intellectual property in any Microsoft product.

Permission for Reuse: This guide may be used for non-profit educational and training purposes only. These materials may be printed and duplicated when used for educational or training purposes and not for resale. If you or your organization wants to use these materials for any other purpose, you may submit a request to and obtain [written permission from](#)

Microsoft (www.microsoft.com/About/Legal/EN/US/IntellectualProperty/Permissions/Default.aspx).

Requests will be considered on a case-by-case basis.

[Terms of use: www.microsoft.com/About/Legal/EN/US/IntellectualProperty/Permissions/Default.aspx](http://www.microsoft.com/About/Legal/EN/US/IntellectualProperty/Permissions/Default.aspx)

[Trademarks: www.microsoft.com/about/legal/en/us/IntellectualProperty/Trademarks/Default.aspx](http://www.microsoft.com/about/legal/en/us/IntellectualProperty/Trademarks/Default.aspx)

To download a copy of this guide, visit: www.microsoft.com/enable/education/,

and www.microsoft.com/education/enable/

Copyright © 2013 Microsoft Corporation. All rights reserved.

Microsoft, Windows, Internet Explorer, Access, Excel, InfoPath, OneNote, Outlook, PowerPoint, SharePoint, Lync, Office 365, SmartArt, Surface, Kinect, Xbox, Visio, SkyDrive, Skype, Natural, Backstage are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. All other trademarks are property of their respective owners.

Table of Contents

About This Guide	5
Purpose of This Guide	5
Chapter 1: Personalized Learning & Accessibility	6
What is Accessibility and Accessible Technology?.....	7
The Need for Accessible Technology in Schools	7
The Challenge: Inclusive Classrooms with Equal Access for All Students.....	8
Chapter 2: Impairment Types & Technology Solutions	9
Defining Disability and Impairment.....	9
Vision Impairments.....	10
Learning Impairments.....	16
Mobility and Dexterity Impairments.....	18
Hearing Impairments and Deafness	25
Language Impairments	29
Chapter 3: Accessibility in Microsoft Products	32
Accessibility in Windows 8.....	32
Accessibility in Internet Explorer 10.....	37
Accessibility in Microsoft Office 2013	39
Accessibility in Microsoft Office 365.....	45
Accessibility in Microsoft Lync 2013	47
Kinect in the Classroom: Engaging Students in New Ways.....	49
Chapter 4: Selecting Accessible Technology	53
Accessibility Consultants.....	53
Assistive Technology Decision Tree	55
Assistive Technology Product Starter Guide	59
Resources	63
Resources from Microsoft.....	63
Additional Resources and Annual Conferences	64
Glossary of Terms	65
Links	68

About This Guide

Purpose of This Guide

In the era of personalized learning, the focus has shifted from what is being taught to what is being learned. The student's needs and style are now key. Personalized learning requires attention to the unique learning abilities of all students—including students with learning or physical disabilities. As teachers urge students to take more responsibility for their learning, and require students to use technology to acquire new skills, schools have to provide accessible technology that is appropriate for each student's needs.

This guide provides information about accessibility and accessible technology to help educators worldwide ensure that all students have equal access to learning with technology. For educators new to accessibility and working with students with disabilities, accessibility can seem overwhelming. To help educators teach students with all types of abilities, you will find specific information about each type of impairment and accessible technology solutions to use in the classroom. Educators can also visit the Partners in Learning Network (www.pil-network.com) for further information, community discussions, learning activities and other resources to support teaching and learning for all students.

How to Use This Guide

Chapter 1 provides an overview of accessibility, defines accessible technology, and discusses the importance of providing students with accessible technology in the era of personalized learning.

Chapter 2 provides an overview of types of disabilities and impairments organized by vision, learning, mobility and dexterity, hearing, and language. Each type of impairment is defined. A section on how to access built-in accessibility features and options in Windows 8 is provided, as well as descriptions of assistive technology products teachers and their students may find useful in relation to specific impairments.

Chapter 3 provides an overview of accessibility features and options in Windows 8, Internet Explorer 10, Office 2013, Office 365, Lync 2013, Kinect for Xbox 360, and Kinect for Windows. Brief descriptions and links to further information are provided.

Chapter 4 provides guidance on selecting accessible technology including how to identify the right mix of accessibility solutions, an assistive technology product starter guide, and an assistive technology decision tree, as well as additional resources available to educators through associations and disability advocacy organizations.

Resources provides Microsoft, accessibility association, and international disability advocacy group contact information.

Glossary provides definitions of words and terms used in this document.

Links provides the full URL (web address) for some hyperlinked (blue underlined links) within this document if the URL is too long to include in the description it references.

Download

This guide is available for download on the [Microsoft Accessibility Website: www.microsoft.com/enable/education/](http://www.microsoft.com/enable/education/), and the [Microsoft Accessibility in the classroom](http://www.microsoft.com/education/enable/) webpage: www.microsoft.com/education/enable/

Chapter 1:

Personalized Learning & Accessibility

Education leaders around the world are focused on preparing students in primary and secondary schools for tomorrow's world, with the objective of helping each one meet his or her maximum potential. This focus, combined with the realization that every child learns in a unique way, is at the heart of "personalized learning." As educators strive to reach this goal, technology emerges as a key component in making personalized learning a reality.

"I have long believed in the power of technology to make a profound impact in education and I've been fortunate enough to see some amazing examples around the world where teachers are truly making magic happen for their students. The examples that often most stand out and illustrate the transformative potential of technology are those that use accessible technology integration to empower and enrich the world of students that otherwise might have had an extremely difficult time communicating, collaborating, or socializing with their peers."

— Anthony Salcito, Worldwide Vice President of Education, Microsoft Corporation

Personalized learning requires attention to the unique needs of all students—including students with learning or physical impairments and disabilities. As students are encouraged to take greater responsibility for their learning and for using technology to acquire new skills, schools have a responsibility to provide accessible technology that can be personalized for each student's needs. Providing accessible technology in the classroom to students with a wide range of disabilities and impairments—from mild to severe, and from temporary to permanent—enables all students to have equal educational opportunities.

At Microsoft, we embrace our role and responsibility in helping to ensure students of all abilities have opportunities to learn 21st century skills. Microsoft has a long history of [commitment to accessibility](http://www.microsoft.com/enable/microsoft/default.aspx) (www.microsoft.com/enable/microsoft/default.aspx), and we support the personalized learning vision by providing technology that is accessible to every student—regardless of ability.

What is Accessibility and Accessible Technology?

In this guide, accessible technology is defined as computer technology that enables individuals to adjust a computer to meet their vision, hearing, dexterity and mobility, learning, and language needs. For many, accessibility is what makes computer use possible in the first place. Moreover, accessibility makes it easier for all students to see, hear, and use a computer, and to personalize their computers to meet their own needs and preferences.

Although many people believe that accessibility is just for computer users with disabilities, in reality, the majority of people benefit from accessibility features. For example, most people want to adjust colors, font styles and sizes, background images, and sounds to make it easier and more comfortable to use a computer. Using voice control to create a text message on a mobile phone lets users choose the way they want to access information.

Accessible technology encompasses:

- **Accessibility features or settings** built into the operating system and other software programs. These features can be adjusted to meet vision, hearing, dexterity and mobility, language, and learning needs. For example, in Windows 8, you can change the font size and color, and mouse pointer size, color, and movement options. Microsoft Windows, Microsoft Office, Microsoft Office 365, and Microsoft Internet Explorer include additional accessibility features and settings that can be adjusted to make the computer easier to see, hear, and use.
- **Assistive technology products** (specialty hardware and software products) that accommodate an individual's impairment, disability, or multiple disabilities. Examples include a screen magnification program for a computer user who has low vision or an ergonomic keyboard for a computer user with wrist pain. The products are usually add-ons to a computer system and are available from [independent technology companies \(www.microsoft.com/enable/at/\)](http://www.microsoft.com/enable/at/).

Note: Windows RT only supports the installation of apps through the [Windows Store](http://www.microsoft.com/windows-store/)¹. Windows 8, or Windows 8 Professional, is required for individuals using assistive technology software or devices. Also, be sure to check with the [assistive technology manufacturer](#) regarding compatibility with Windows 8 before purchasing a new device.

The Need for Accessible Technology in Schools

Accessible technology in schools is important for several reasons. First and foremost, many countries require schools, by law, to provide equal access to technologies for students with disabilities. Among the many reasons for legislating equal access is the inclusion of students with disabilities in mainstream classrooms.

In many countries, students with special needs are being integrated into mainstream classrooms, rather than isolated in schools that focus solely on students with disabilities. This trend makes it especially important for schools and educators to understand how accessible technology benefits all students.

¹ Windows Store (<http://windows.microsoft.com/en-us/windows-8/windows-store/>)

Prevalence of Adults and Students with Disabilities Across the Globe

According to the World Health Organization's 2011 [World Report on Disability](#)², based on 2010 world population estimates, more than one billion people live with some form of disability—about 15% of the world's population.

The number of children 0 – 14 years living with disabilities is estimated between 93 - 150 million. [UNESCO](#)³ (pointing to WHO data, 2008) and [UNICEF](#)⁴ (2006) use the figure 150 million children with disabilities worldwide.

The definition of disability varies by research organization and ranges from mental disability or developmental delay to impairments in seeing, hearing, speaking, and walking.

A significant number of individuals need educational aids such as accessible and assistive technology during their learning years. Meanwhile, overall student use of computers is increasing. This increase drives the requirement to provide assistive technology for those with disabilities.

Educational Technology in Schools and the Workforce of the Future

The use of computers and other forms of technology used in education—as well as in the home, and virtually all phases of life in the modern world—is rising. In many countries, almost all students have access to a computer at school.

Students with and without disabilities are our future workforce. Proficiency in computer technology is an important and powerful skill, and increases employment opportunities for people with disabilities. Integrating accessible technology into schools, and introducing it to students with disabilities early in their educational lives, not only enhances their learning, but their future employment options as well.

The Challenge: Inclusive Classrooms with Equal Access for All Students

With the increased use of computers in schools, and the increased number of students with disabilities included in general education classrooms, it is even more important to make sure that all students have equal access to computer technology and the educational opportunities it provides.

Fortunately, personal productivity software publishers and educational software developers are today including children with disabilities in their target audiences. As an educator, you can help ensure that students with disabilities have the same access to technology as their peers by seeking out solutions that are accessible for all. Accessibility benefits everyone.

² World Report on Disability (www.who.int/disabilities/world_report/2011/en/)

³ UNESCO (www.unesco.org/new/en/unesco/about-us/who-we-are/introducing-unesco/)

⁴ UNICEF (www.unicefusa.org/)

Chapter 2:

Impairment Types & Technology Solutions

This chapter discusses the term “disability” and outlines the different types of impairments. This includes vision, learning, mobility and dexterity, hearing and deafness, and language impairments. Specific examples of accessible technology solutions are provided for each type of impairment or disability.

Defining Disability and Impairment

A quick Internet search on the question “What is the definition of disability?” is likely to net thousands of matches. Each person who tackles the question does so from a particular perspective and bias. In fact, most of us already have our own definition of what disability means, based on our own frame of reference. In many cases, the definition is all about legal contracts and insurance benefits.

The definition of a “disability,” is relevant in this discussion only because we discuss accessible technology solutions for different types of disabilities and impairments. Later in the guide, we use the term “impairment” to include the wide range of impairments and disabilities from mild to severe.

Before determining how accessible technology can benefit your students, it is beneficial to understand the types of impairments and how those impairments impact computer use.

Following are descriptions of impairment types and suggested accessibility features and assistive technology products for:

- Vision impairments
- Learning impairments
- Mobility and dexterity impairments
- Hearing impairments and deafness, and
- Language impairments

Vision Impairments

According to [UNICEF](#)⁵ there are an estimated 150 million children with disabilities in the world. The [2011 American Community Survey](#)⁶ found that out of an estimated U.S. population of 306.6 million people, more than 37.5 million live with some type of disability, and, more than 6.6 million have vision difficulties.

Vision impairments include:

- **Low vision.** Students with low vision do not have clear vision even with the use of eyeglasses, contact lenses, or intraocular lens implants. For students with vision impairments and low vision, the computer monitor, appearance, text and icon size, and resolution can all be modified to make text and images more legible and easier to see. For students who still have difficulty seeing things on the screen, Magnifier (as well as sound and touch options) is available through Windows and compatible assistive technology products to make computing possible.
- **Colorblindness.** Students who are colorblind have difficulty seeing particular colors or distinguishing between certain color-combinations. Software that allows users to choose the display's color combinations and adjust screen contrast is helpful for people who are colorblind. Individuals with a variety of vision impairments often find it easier to read white text on a black background instead of black on white. Windows makes available the use of High Contrast color schemes, or you can select your own color schemes so you may choose colors that are easiest for you to read.
- **Blindness.** Blindness occurs in a variety of degrees, and many people who are considered blind do have some measure of sight. For example, a person whose level of sight is equal to or less than 20/200—even with corrective glasses or lenses—is “legally blind.” A person who is sightless is referred to as “blind.” Many diseases and conditions contribute to, or cause, blindness, including cataracts, cerebral palsy, diabetes, glaucoma, multiple sclerosis, macular degeneration, and accidents.

Students who are blind can interact with a computer through screen readers, keyboards, Braille devices, and audio/voice rather than a traditional monitor and mouse. The use of sophisticated assistive technology provides for both computer input and output, and is critical for people who are blind.

Students who are both deaf and blind can also interact with computers using assistive technology products. To someone who is both deaf and blind, captioning and other sound options are of no use, but Braille assistive technology products are critical. People who are both deaf and blind can use computers by using refreshable Braille displays and Braille embossers, discussed below.

⁵ UNICEF, State of the World's Children Report www.unicef.org/sowc06/profiles/disabilities.php


⁶ American Community Survey 2011, Disability Characteristics www.census.gov/acs/www/

Accessibility Features in Windows for Students with Vision Impairments

Windows includes numerous features and options for students who have difficulty seeing the screen, or for students who are blind and need to use the computer without a display. This section describes the features and options available in Windows 8 and how to access them. See Chapter 3 for more information on these features as well as accessibility features in other Microsoft products that also support Windows accessibility options.

Make the Computer Easier to See

For students who have vision impairments and low vision, turn on or adjust settings to **Make the computer easier to see** in the Ease of Access Center in Windows 8.

1. In Windows 8, open the Ease of Access Center by pressing the Windows logo key +U. Under **Explore all settings** select **Make the computer easier to see**.
2. On the **Make the computer easier to see** screen, you can select the options that you want to use:
 - Choose a **High Contrast theme**. Use this option to set a high-contrast color scheme (such as white on black) that heightens the color contrast of some text and images on your computer screen, making those items more distinct and easier to identify.
 - **Turn on or off High Contrast when left Alt+Left Shift+Print Screen is pressed**. Use this option to toggle a high-contrast theme on or off by pressing the Left Alt+Left Shift+Print Screen keys.
 - **Turn on Narrator**. Use this option to set Narrator (the basic built-in Windows screen reader) to run when you log on to your computer. Narrator reads aloud on-screen text and describes some on-screen events (such as error messages appearing) while you're using the computer. For more information about using Narrator, see [Hear text read aloud with Narrator](http://windows.microsoft.com/en-US/windows-8/hear-text-read-aloud-with-narrator/) (<http://windows.microsoft.com/en-US/windows-8/hear-text-read-aloud-with-narrator/>).
 - **Turn on Audio Description**. Use this option to set Audio Descriptions to run when you log on to your computer. Audio Descriptions describe what's happening in videos (when available).
 - **Change the size of text and icons**. Use this option to make text and other items on your screen appear larger, so they're easier to see. For more information, see [Make the text on your screen larger or smaller](http://windows.microsoft.com/en-US/windows-8/make-text-screen-larger-smaller/) (<http://windows.microsoft.com/en-US/windows-8/make-text-screen-larger-smaller/>).
 - **Turn on Magnifier**. One of the most common accessibility solutions for a computer user with low vision is a screen magnifier. Microsoft Windows includes a screen magnification tool called Magnifier that enlarges portions of the screen making it easier to view text and images and to see the whole screen more easily. Magnifier in Windows 8 includes full-screen mode, lens mode (Figure 2-1), and docked mode. The magnification quality is improved and you can set the magnification level up to 16 times the original size, and choose to track what you magnify by movement of your mouse, the keyboard, or text editing. For more information about using Magnifier, see [Use Magnifier to see items on the screen](http://windows.microsoft.com/en-US/windows-8/use-magnifier-to-see-items/) (<http://windows.microsoft.com/en-US/windows-8/use-magnifier-to-see-items/>).

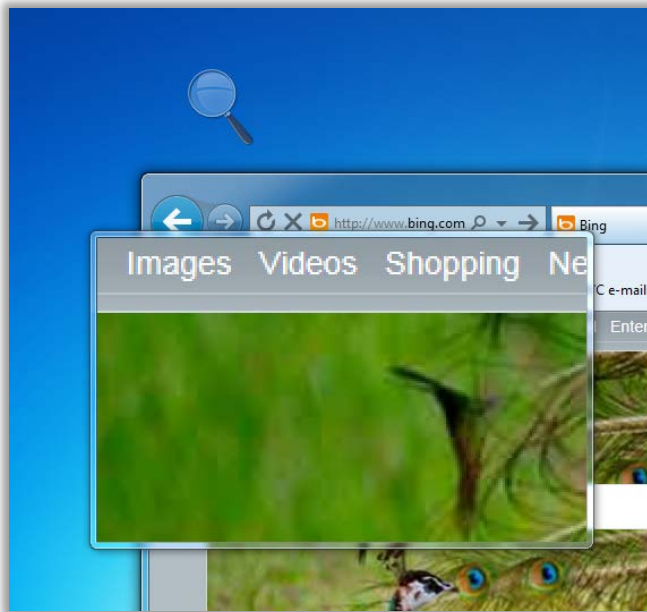


Figure 2-1. Magnifier in lens mode


- **Adjust the color and transparency of the window borders.** Use this option to change the appearance of window borders to make them easier to see.
- **Fine tune display effects.** Use this option to customize how certain items appear on your desktop.
- **Make the focus rectangle thicker.** Use this option to make the rectangle around the currently selected item in dialog boxes thicker, which makes it easier to see.
- **Set the thickness of the blinking cursor.** Use this option to make the blinking cursor in dialog boxes and programs thicker and easier to see.
- **Turn off all unnecessary animations.** Use this option to turn off animation effects, such as fading effects, when you close windows and other elements.
- **Remove background images.** Use this option to turn off unimportant, overlapped content and background images to help make the screen easier to see.

For additional information about how to use accessibility features in Windows and other Microsoft products, see the [Microsoft Accessibility Tutorials](http://www.microsoft.com/enable/training/) available online at: www.microsoft.com/enable/training/

Use the Computer Without a Display

For students who are blind, or partially blind, accessibility options and assistive technology products are critical for productive computer use. To get started, Windows has many features that enable students to use the computer without a display. For example, you can have screen text read aloud by using Narrator or you can have Windows describe screen activity to you.

For students who are blind and cannot use a monitor you can turn on or adjust settings to **Use the computer without a display** in the Ease of Access Center.

1. In Windows 8, open the Ease of Access Center by pressing the Windows logo key +U. Under **Explore all settings**, select **Use the computer without a display**.
2. On the **Use the computer without a display** screen, select the options that you want to use:
 - **Narrator.** Narrator is a basic screen reader that reads aloud the text that appears on screen, and describes events such as error messages. It has been redesigned in Windows 8 to be substantially faster, and to support many new features. Whether you're an individual who is blind, has low vision, or, are fully sighted, you can use Narrator from the first time you start your device. For more information about Narrator, see [Hear text read aloud with Narrator](http://windows.microsoft.com/en-US/windows-8/hear-text-read-aloud-with-narrator/) (<http://windows.microsoft.com/en-US/windows-8/hear-text-read-aloud-with-narrator/>).
 - **Turn on Audio Description.** Use this option to set Audio Descriptions to run when you log on to Windows. Audio descriptions describe what's happening in videos (when available).
 - **Turn off all unnecessary animations.** Use this option to turn off animation effects, such as fading effects, which can be distracting to some users, when windows and other elements are closed.
 - **How long should Windows notification dialog boxes stay open?** Use this option to set how long notifications are displayed on the screen before they are closed. This option can be set to ensure the needed amount of time to read the notifications.

Keyboard Shortcuts

Keyboard shortcuts are combinations of two or more keys that, when pressed, initiate a command that typically requires a mouse or other pointing device. For example, you can use the key combination Ctrl+C to copy text, and then Ctrl+V to paste it in your document. Keyboard shortcuts can make it easier for students with all kinds of impairments, particularly vision and mobility/dexterity impairments, to interact with their computers. Memorizing a few keyboard shortcuts makes it easier for some students who have difficulty seeing the monitor or keyboard to quickly accomplish tasks.

A list of [keyboard shortcuts for Windows 8](http://windows.microsoft.com/en-US/windows-8/keyboard-shortcuts/) is available at <http://windows.microsoft.com/en-US/windows-8/keyboard-shortcuts/>.

Assistive Technology for Students with Vision Impairments

For the operating system or an application to be accessible to someone who is blind, it must provide information about its interactions with the user. Then, assistive technology can present the information in an alternative format such as text-to-speech or Braille. For example, if the computer displays a list box that contains several selections to choose from, the assistive technology product must inform a computer user who is blind that he or she needs to choose from a list of selections. The list of selections might be spoken or presented in a tactile fashion with a Braille display. A common assistive technology product used by people who are blind is a screen reader. Screen readers are software programs that present graphics and

text as speech. Computer users who are blind also may use Braille displays and Braille printers—in fact, a combination of assistive technology products is quite common.

Assistive Technology Product Guide

Chapter 4 includes a table with details about specific assistive technology products.

Assistive Technology Products for Students with Vision Impairments

Assistive technology products with different capabilities are available to help people with vision impairments. Some assistive technology products provide a combination of capabilities that help specific individuals. Some of the assistive technology products available from [independent technology companies \(www.microsoft.com/enable/at/\)](http://www.microsoft.com/enable/at/) helpful to students and adults with vision impairments are:

- **Screen magnifiers**, which work like a magnifying glass. They enlarge a portion of the screen as the user moves the focus—increasing legibility for some users. Some screen enlargers (software or hardware) allow a user to zoom in and out on a particular area of the screen. An example of a screen magnifier program is ZoomText by AiSquared. See also: Microsoft Hardware website [mice \(www.microsoft.com/hardware/en-us/mice\)](http://www.microsoft.com/hardware/en-us/mice) and [keyboard \(http://www.microsoft.com/hardware/en-us/keyboards\)](http://www.microsoft.com/hardware/en-us/keyboards) products.
- **Screen readers** (or software programs) that present graphics and text as speech. A screen reader is used to verbalize, or "speak," everything on the screen including names and descriptions of control buttons, menus, text, and punctuation. An example of a screen reader is Window-Eyes.
- **Braille printers** (or embossers) that transfer computer-generated text into embossed Braille output. Braille translation programs convert text scanned in or generated via standard word processing programs into Braille, which can be printed into raised Braille. The Tiger Cub Jr. is an example of a Braille printer.
- **Braille displays** (as shown in Figure 2-2) that provide tactile output of information represented on the computer screen. The user reads the Braille letters with his or her fingers, and then, after a line is read, refreshes the display to read the next line. The Seika Braille Display is an example.

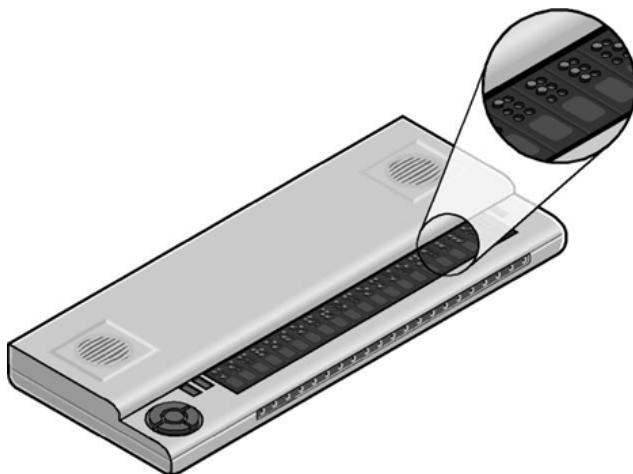


Figure 2-2. Braille display

- **Braille notetakers** that enable a student who is blind to capture notes and then transfer them to a PC. Braille notetakers take advantage of refreshable Braille technology. In some cases, Braille notetakers replace or supplement a standard keyboard. An example of such a notetaker is the Eurobraille Esys.
- **Book readers.** Students with low vision need book reading assistance. Magnification devices are available as a desktop magnification aid (such as Desktop SenseView DSV) or as a portable magnification aid (such as SmartView Nano Magnifier). A student may also use a PC configuration for book reading assistance (for example, Cicero Text Reader). Some students may also use a dedicated reading device (such as the Victor Reader Wave).

A student's ability to read classroom materials depends upon the format in which the material is available and what accessibility needs the student has. For example, students with low vision can use a desktop or portable magnification aid to read printed materials and books. A student who is blind can have printed material scanned and read aloud through a text-to-speech software program on the PC. In addition, books are available in digital formats through organizations such as [Bookshare](http://www.benetech.org/literacy/bookshare.shtml) (www.benetech.org/literacy/bookshare.shtml) and [Learning Ally](https://www.learningally.org/) (<https://www.learningally.org/>) (formerly, Recording for the Blind and Dyslexic).

Learning Impairments

According to [UNICEF](#)⁷ there are an estimated 150 million children with disabilities in the world. The [2011 American Community Survey](#)⁸ found that out of an estimated U.S. population of 306.6 million people, more than 37.5 million live with some type of disability, and, more than 14 million have cognitive difficulties.

Learning impairments range from conditions such as dyslexia and attention deficit disorder to Down syndrome, for example. Processing problems are the most common and have the most impact on a person's ability to use a computer. These conditions interfere with the learning process.


Many students with these types of impairments are perfectly able to learn when information is presented to them in a form, and at a pace, that is appropriate for them. For example, some students find it easier to understand information that is presented in short, discrete units. In addition, many individuals with learning disabilities learn more efficiently using visual rather than auditory senses or vice versa. To provide a good learning experience, control over the individual learner's single- or multi-sensory experience is critical.

Accessibility Features in Windows for Students with Learning Impairments

Windows includes numerous features and options for students who have learning impairments. This section describes the features and options available in Windows 8 and how to access them. See Chapter 3 for more information on these features as well as accessibility features in other Microsoft products.

Make it Easier to Focus on Reading and Typing Tasks

You can use the settings on the **Make it easier to focus on tasks** screen in the Ease of Access Center in Windows 8 to reduce the amount of information on the screen and to help students focus on reading and typing tasks.

1. In Windows 8, open the Ease of Access Center by pressing the Windows logo key +U. Under **Explore all settings**, select **Make it easier to focus on tasks**.
2. On the **Make it easier to focus on tasks** screen, select the options that you want to use:
 - **Turn on Narrator.** Windows comes with a built-in basic screen reader called Narrator, which reads text on the screen aloud and describes some events (such as error messages) that happen while you're using the computer. This option sets Narrator to run when you log on to Windows. For more information about Narrator, see [Hear text read aloud with Narrator](http://windows.microsoft.com/en-US/windows-8/hear-text-read-aloud-with-narrator/) (<http://windows.microsoft.com/en-US/windows-8/hear-text-read-aloud-with-narrator/>).
 - **Remove background images.** Use this option to turn off all unimportant, overlapped content and background images to help make the screen easier to see and less cluttered.
 - **Turn on Sticky Keys.** Use this option to set Sticky Keys to run when you log on to Windows. With Sticky Keys turned on, instead of having to press three keys at once (such as when you must press the Ctrl, Alt, and Delete keys together to log on to Windows), you can use one key at a time. Then, you can press a modifier key (a key that modifies the normal action of another key when the two are pressed in combination, such as the Alt key) and have it remain active until another key is pressed.

⁷ UNICEF, State of the World's Children Report www.unicef.org/sowc06/profiles/disabilities.php

⁸ American Community Survey 2011, Disability Characteristics www.census.gov/acs/www/

- **Turn on Toggle Keys.** Use this option to set Toggle Keys to run when you log on to Windows. With Toggle Keys turned on, you can receive an alert each time you press the Caps Lock, Num Lock, or Scroll Lock keys. These alerts can help prevent the frustration of inadvertently pressing a key and not realizing it.
- **Turn on Filter Keys.** Use this option to set Filter Keys to run when you log on to Windows. With Filter Keys turned on, Windows will ignore keystrokes that occur in rapid succession, or keystrokes that are held down for several seconds unintentionally.
- **Turn off all unnecessary animations.** Use this option to turn off animation effects, such as fading, when windows and other elements are closed.
- **Choose how long Windows notification dialog boxes stay open.** Use this option to choose how long notifications are displayed on the screen before they close—allowing adequate time to read them.

Assistive Technology Products for Students with Learning Impairments

Some of the assistive technology products available from [independent technology companies \(www.microsoft.com/enable/at/\)](http://www.microsoft.com/enable/at/) used with computers by people with learning impairments are:

- **Word prediction programs.** These allow the user to select a desired word from an on-screen list located in the prediction window. The program predicts words from the first one or two letters typed by the user. The word can then be selected from the list and inserted into the text by typing a number, clicking the mouse, or scanning with a switch. These programs help support literacy, increase written productivity and accuracy, and increase vocabulary skills through word prompting. ClaroRead Standard and TextHelp Read & Write Standard are just two examples of such programs.
- **Reading tools and learning disabilities programs.** These include software designed to make text-based materials more accessible for people who struggle with reading. Options can include scanning, reformatting, navigating, or speaking text out loud. These programs help people who have difficulty seeing or manipulating conventional print materials; people who are developing new literacy skills, or who are learning English as a foreign language; and people who comprehend better, when they hear and see text highlighted simultaneously. The Universal Reader is an example of assistive technology that can make reading easier.
- **Speech synthesizers.** Also known as text-to-speech, these programs speak information aloud in a computerized voice. Speech synthesizers can be helpful for students with learning, language, or vision impairments. Products such as Scan and Read Pro produce natural sounding speech synthesis that can support reading skills development.
- **Speech recognition programs.** These allow computer navigation by voice rather than entering data by keyboard or mouse. You can still use a mouse and keyboard as well as voice, to enter data, write text, and navigate applications. Students who have difficulty typing or reading text because of a learning, language, or mobility impairment can often successfully work on a computer with the use of speech recognition. [Speech Recognition is available in Windows 8 \(http://windows.microsoft.com/en-US/windows-8/using-speech-recognition/\)](http://windows.microsoft.com/en-US/windows-8/using-speech-recognition/). Some may prefer or require a more robust speech recognition program, such as Dragon NaturallySpeaking.

Mobility and Dexterity Impairments

Mobility and dexterity impairments can be caused by a wide range of common illnesses and accidents such as cerebral palsy, multiple sclerosis, loss of limbs or digits, spinal cord injuries, and repetitive stress injury, among others. As a result, students might be unable to use arms or fingers to interact with their computers using a standard keyboard or mouse. Temporary mobility impairments might occur with a broken arm, for example, and are also included in this category.

Others who have dexterity impairments or pain in their hands, arms, and wrists might need to adjust settings to make it more comfortable to use a keyboard or mouse. For example, some people cannot press multiple keys simultaneously (like Ctrl+Alt+Delete). Still others might strike multiple keys or repeat keys unintentionally. Some students might have use of their hands and arms but have a limited range of motion. All of these conditions can make using a standard mouse or keyboard difficult, if not impossible.

Mobility and dexterity impairments need to be addressed individually to set up the right mix of accessibility features in Windows and assistive technology hardware and software solutions.


There are many types of products available that allow students to use a computer, even if the students can move only their eyes. Outlined below are accessibility features in Windows to make the mouse and keyboard more comfortable. In addition, you can set up a computer for a student who needs to use an on-screen keyboard and other alternative input options rather than a standard keyboard or mouse.

Accessibility Features in Windows for Students with Mobility and Dexterity Impairments

Windows includes numerous features and options for students with mobility and dexterity impairments. This section describes the features and options available in Windows 8 and how to access them. See Chapter 3 for more information on these features as well as accessibility features in other Microsoft products.

Make the Mouse Easier to Use


For students who have pain or discomfort when using the mouse, or other dexterity impairments, consider a different style of mouse (options discussed below), and try changing the size of the mouse cursor and the mouse button options to make the mouse easier to use. Start by exploring the mouse options available on the **Make the mouse easier to use** screen in the Ease of Access Center.

1. In Windows 8, open the Ease of Access Center by pressing the Windows logo key +U. Under **Explore all settings**, select **Make the mouse easier to use**.
2. On the **Make the mouse easier to use** screen, select the options that you want to use:
 - **Change the color and size of mouse pointers.** Use this option to make the mouse pointer larger, or change the colors to make it easier to see.
 - **Turn on Mouse Keys.** Use this option to control the movement of the mouse pointer by using the numeric keypad.
 - **Activate a window by hovering over it with the mouse.** Use this option to make it easier to select and activate a window by pointing at it with the mouse rather than by clicking it.
 - **Prevent windows from being automatically arranged when moved to the edge of the screen.** Use this option to prevent windows from automatically resizing and docking along the sides of your screen when you move them there.

- You can also **change mouse settings** including customizing the mouse in a variety of ways, such as reversing the functions of your mouse buttons, making the mouse pointer more visible, and altering the scroll wheel speed. In Windows 8, open the Mouse Control Panel by typing **mouse** in the Search box, clicking **Settings**, and then clicking **Mouse**.

Make the Keyboard Easier to Use

For a student who has pain or discomfort when using the keyboard, consider a different style of keyboard (options discussed below). You can also adjust the keyboard controls on the **Make the keyboard easier to use** screen in the Ease of Access Center.


1. In Windows 8, open the Ease of Access Center by pressing the Windows logo key +U. Under **Explore all settings**, select **Make the keyboard easier to use**.
2. On the **Make the keyboard easier to use** screen, select the options that you want to use:
 - **Turn on Mouse Keys.** Use this option to set Mouse Keys to run when you log on to Windows. With Mouse Keys turned on, instead of using the mouse, you can use the arrow keys on your keyboard or the numeric keypad to move the pointer.
 - **Turn on Sticky Keys.** Use this option to set Sticky Keys to run when you log on to Windows. With Sticky Keys turned on, instead of having to press three keys at once (such as when you must press the Ctrl, Alt, and Delete keys together to log on to Windows), you can use one key at a time. Then, you can press a modifier key (a key that modifies the normal action of another key when the two are pressed in combination, such as the Alt key) and have it remain active until another key is pressed.
 - **Turn on Toggle Keys.** Use this option to set Toggle Keys to run when you log on to Windows. With Toggle Keys turned on, you can receive an alert each time you press the Caps Lock, Num Lock, or Scroll Lock keys. These alerts can help prevent the frustration of inadvertently pressing a key and not realizing it.
 - **Turn on Filter Keys.** Use this option to set Filter Keys to run when you log on to Windows. With Filter Keys turned on, Windows will ignore keystrokes that occur in rapid succession, or keystrokes that are held down for several seconds unintentionally.
 - **Underline keyboard shortcuts and access keys.** Use this option to make keyboard access in dialog boxes easier by highlighting access keys for the controls in them. (For more information about keyboard shortcuts, see below).
 - **Prevent windows from being automatically arranged when moved to the edge of the screen.** Use this option to prevent windows from automatically resizing and docking along the sides of your screen when you move them there.

Keyboard Shortcuts

Keyboard shortcuts are combinations of two or more keys that, when pressed, initiate a command that would typically require a mouse or other pointing device. Keyboard shortcuts can make it easier for students with all kinds of impairments, particularly those with dexterity issues who might find using the mouse difficult or tiring. Memorizing a few keyboard shortcuts makes navigating the computer faster for students.

A list of [keyboard shortcuts for Windows 8](http://windows.microsoft.com/en-US/windows-8/keyboard-shortcuts/) is available at: <http://windows.microsoft.com/en-US/windows-8/keyboard-shortcuts/>.

Here are a few keyboard shortcuts for the features mentioned in this section:

Press this key	To-do-this
Right Shift for eight seconds	Turn Filter Keys on and off
Left Alt+Left Shift+Print Screen	Turn High Contrast on or off
Left Alt+Left Shift+Num Lock	Turn Mouse Keys on or off
Shift five times	Turn Sticky Keys on or off
Num Lock for five seconds	Turn Toggle Keys on or off
Windows logo key  +U	Open the Ease of Access Center

Use the Computer Without the Mouse or Keyboard

Windows 8 includes features that make it possible to use the computer without a mouse or keyboard. Windows Speech Recognition lets you use voice commands to navigate your computer screen. On-Screen Keyboard, lets you enter text by selecting keys on a visual keyboard displayed on the computer screen. Touchscreen-enabled Windows 8 computers and tablets also let you navigate the screen without the use of a mouse or keyboard. See the section “Touchscreens” in the assistive technology section of this topic.

You can turn on or adjust settings for these features on the **Use the computer without a mouse or keyboard** screen in the Ease of Access Center.


1. In Windows 8, open the Ease of Access Center by pressing the Windows logo key +U. Under **Explore all settings**, select **Use the computer without a mouse or keyboard**.
2. Select the options that you want to use:
 - **Use On-Screen Keyboard.** On-Screen Keyboard displays a visual keyboard with all the standard keys. Instead of relying on the physical keyboard to type and enter data, you can use On-Screen Keyboard to select keys using the mouse or another pointing device. You can resize and customize the On-Screen Keyboard in Windows 8 to make it easier to see and use. On-Screen Keyboard (Figure 2-3) includes text prediction in eight languages. When text prediction is enabled, as you type, On-Screen Keyboard displays a list of words that you might be typing. For more information, see [Use the On-Screen Keyboard \(OSK\) to Type](http://windows.microsoft.com/en-US/windows-8/type-with-the-on-screen-keyboard/) (<http://windows.microsoft.com/en-US/windows-8/type-with-the-on-screen-keyboard/>).



Figure 2-3. On-Screen Keyboard in Windows 8 with text prediction

- **Use Speech Recognition.** Use this option to control the computer with your voice. With a microphone, you can speak commands that the computer will understand and respond to, as well as dictate text. For more information about setting up Speech Recognition, see [Using Speech Recognition \(http://windows.microsoft.com/en-US/windows-8/using-speech-recognition/\)](http://windows.microsoft.com/en-US/windows-8/using-speech-recognition/).

Assistive Technology Products for Students with Mobility and Dexterity Impairments

Some of the assistive technology products available from independent technology companies (www.microsoft.com/enable/at/) used with computers by people with mobility and dexterity impairments are:

- **Ergonomic keyboards and mice.** Ergonomic keyboards and mice are designed to be more comfortable than a standard keyboard and mouse. To improve the quality and health of your PC experience, Microsoft designers and ergonomists created industry-leading keyboard and mouse products to encourage healthier hand and wrist positions. Microsoft Natural keyboards and mice have set the industry standard for comfort, and can reduce carpal tunnel syndrome symptoms. [Microsoft keyboards and mice \(http://www.microsoft.com/hardware/\)](http://www.microsoft.com/hardware/) also have built-in zoom and magnifier options.
- **Joysticks** can be plugged into the computer's mouse port and used to control the cursor on the screen. Joysticks benefit users who need to operate a computer with or without the use of their hands. For example, some people might operate the joystick with their feet or with the use of a cup on top of the joystick that can be manipulated with their chin. An example of a joystick is the SAM-Joystick.
- **Trackballs** look like a mouse with a movable ball on top of a stationary base. An example of a trackball is shown in Figure 2-4. The ball can be rotated with a pointing device or a hand. People who have fine motor skills but lack gross motor skills can use these devices more easily and comfortably than a traditional mouse. BigTrack is an example of a trackball style mouse that is more comfortable for many people with dexterity issues—as well as young children and seniors.

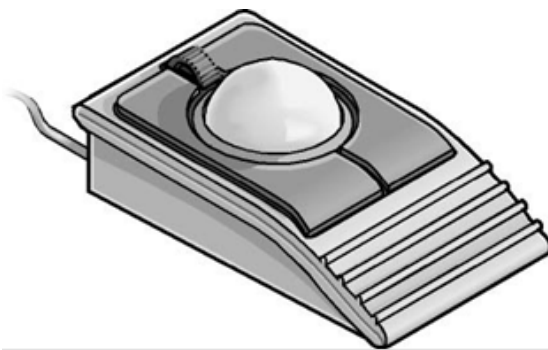


Figure 2-4. Trackball

- **On-screen keyboard programs** provide an image of a standard or modified keyboard on the computer screen. The user selects the keys with a mouse, touchscreen, trackball, joystick, switch, or electronic pointing device. On-screen keyboards often have a scanning option. With the scanning capability turned on, the individual keys on the on-screen keyboard are highlighted. When a desired key is highlighted, the user is able to select it by using a switch positioned near a body part that he or she has under voluntary control. An example is ScreenDoors 2000, an on-screen keyboard product that can be helpful for some students.

See also the built-in [On-Screen Keyboard in Windows 8](http://windows.microsoft.com/en-US/windows-8/type-with-the-on-screen-keyboard/) (<http://windows.microsoft.com/en-US/windows-8/type-with-the-on-screen-keyboard/>)

- **Keyboard filters** include typing aids such as word prediction utilities and add-on spelling checkers. These products can often be used to reduce the number of keystrokes. As an example, imagine you have to type the letter “G.” However, in order to type the letter, you first have to move your finger over the entire first row of your keyboard and halfway across the second row. Along the way, you might accidentally depress “R,” “P,” or “D” keys, but you only want the letter “G.” Keyboard filters enable users to quickly access the letters they need and to avoid inadvertently selecting keys they don’t want. SoothSayer Word Prediction is an example of a keyboard filter.
- **Touchscreens** are monitors, or devices placed on top of computer monitors, which allow direct selection or activation of the computer by touching the screen. These devices can benefit some users with mobility impairments because they present a more accessible target. It is easier for some people to select an option directly rather than through a mouse movement or keyboard. Moving the mouse or using the keyboard for some might require greater fine motor skills than simply touching the screen to make a selection. Other users might make their selections with assistive technology such as mouth sticks. With Windows 8 and a touchscreen monitor, you can just touch your computer screen for a more direct and natural way to work. Use your fingers to scroll, resize windows, play media, and pan and zoom. Learn about Microsoft touchscreen technologies such as [Microsoft Surface](http://www.microsoft.com/Surface/en-US) (www.microsoft.com/Surface/en-US).
- **Alternative PC hardware and all-access workstations.** In some cases, alternative PC hardware is needed. Some individuals with mobility impairments find it challenging to open the monitor of a laptop because the laptop latch isn’t accessible for them. Or, some students might need a laptop to be mounted to a wheelchair. Assistive technology solutions such as these are referred to as “all-access workstations.” The Desktop SenseView DSV is an alternative PC workstation that is easy to control with dexterity impairments and enlarges text for students with vision impairments.
- **Alternative input devices** allow users to control their computers through means other than a standard keyboard or pointing device.

Alternative input devices include:

- Alternative keyboards available in different sizes with different keypad arrangements and angles. Larger keyboards (one example is BigKeys LX) are available with enlarged keys (see the example shown in Figure 2-5, below), which are easier to access by people with limited motor skills. Smaller keyboards are available with smaller keys (or keys placed closer together) to allow someone with a limited range of motion to reach all the keys. Many other keyboards are also available—one hand keyboards, keyboards with keypads located at various angles, and split keyboards where the keypad is split into sections.



Figure 2-5. Alternative keyboard with large keys and ABC layout

- **Electronic pointing devices** used to control the cursor on the screen using ultrasound, an infrared beam, eye movements, nerve signals, or brain waves. When used with an on-screen keyboard, electronic pointing devices also allow the user to enter text or data. The assistive technology product HeadMouse Extreme is an example of a pointing device.
- **Sip-and-puff device**, shown in Figure 2-6, refers to just one of many different types of switch access. In typical configurations, a dental saliva extractor is attached to a switch. An individual uses his or her breath to activate the switch. For example, a puff generates the equivalent of a keystroke, the pressing of a key, a mouse click, and so on. Maintaining constant “pressure” on the switch (more like sucking than sipping) is the equivalent of holding a key down. With an on-screen keyboard, the user “puffs” out the letters. Moving the cursor over a document’s title bar and “sipping” enables the user to drag items around on the screen just as you would with a mouse. This technology is often used with on-screen keyboards. The Jouse 2 is an example of a sip-and-puff device.

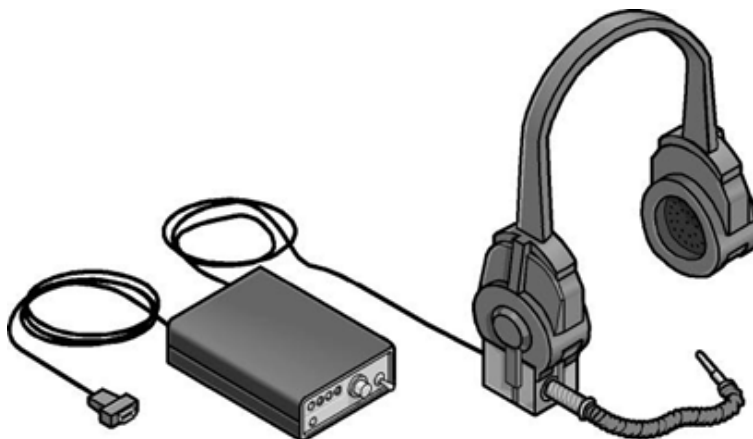


Figure 2-6. Sip-and-puff device

- **Wands and sticks** are typing aids used to strike keys on the keyboard. They are most commonly worn on the head, held in the mouth, strapped to the chin, or held in the hand. They are useful for people who need to operate their computers without the use of their hands or who have difficulty generating fine movements. The majority of these devices are customized for a user by adapting a pencil, or wooden dowel, which can be purchased in most hardware stores.

Hearing Impairments and Deafness

Over five percent of the world's population – 360 million people – has disabling hearing loss (328 million adults and 32 million children), according to the [World Health Organization](#)⁹. Hearing impairments encompass a range of conditions—from slight hearing loss to deafness. Hearing impairments include:

- **Hearing loss and hard-of-hearing.** Students who have hearing loss or are hard-of-hearing may be able to hear some sound, but might not be able to distinguish words. Often, people with this type of hearing impairment can use an amplifying device to provide functional hearing. On the computer, adjusting sounds, using alternatives for sounds such as visual indicators and captions, and headphones to eliminate background noise can be helpful options.
- **Deafness.** Students who are deaf may not be able to hear any sounds or words spoken. It is helpful to adjust the computer to turn on [visual alternatives for sounds](http://windows.microsoft.com/en-US/windows-8/use-visual-alternatives-to-sounds/) (<http://windows.microsoft.com/en-US/windows-8/use-visual-alternatives-to-sounds/>).

Computer Use by People Who Are both Deaf and Blind

People who are both deaf and blind can, and do, use computers with the aid of assistive technology. To someone who is both deaf and blind, captioning and other sound options are of no use, but Braille assistive technology products are critical. People who are both deaf and blind can use computers with assistive technology such as refreshable Braille displays and Braille embossers.

Accessibility Features in Windows for Students with Hearing Impairments

Accessibility features in Windows 8 for those with hearing impairments include changing notifications from sound to visual notifications, volume control, and captioning. Visual notifications and captions allow users to choose to receive visual warnings and text captions, rather than sound messages, for system events such as a new email message arriving.

Accessibility features helpful for students who have hearing impairments include:


- Adjusting volume
- Changing computer sounds
- Using text or visual alternatives for sounds

More Information

See Chapter 3 for more information on these features as well as accessibility features in other Microsoft products.



⁹ Disabling hearing loss refers to hearing loss greater than 40dB in the better hearing ear in adults and a hearing loss greater than 30 dB in the better hearing ear in children. Source: World Health Organization (www.who.int/mediacentre/factsheets/fs300/en/index.html)

Adjust volume

Although most speakers and many keyboards have a volume control buttons, you can also control speaker volume using Windows. One of the easiest ways to adjust it is to click the Speakers button  in the notification area of the taskbar when using desktop view; and then moving the slider up or down to increase or decrease the speaker volume. Or, from the Start screen, swipe in from the right edge of the screen and click **Settings**. Click the **volume control icon** and move the slider up or down to increase or decrease the speaker volume.

To adjust overall sound volume in Windows 8:

1. Swipe in from the right edge of the screen, and then tap **Search**.
(If you're using a mouse, point to the upper-right corner of the screen, move the mouse pointer down, and then click **Search**.) Enter **Adjust system volume** in the search box, and tap or click **Settings**, and then tap or click **Adjust system volume**.
2. Move the slider up to increase the volume.

Make sure the Mute button isn't turned on. If the button looks like this: , muting is turned off. If the button looks like this: , tap or click it to turn off muting.

Change computer sounds

You can select the sounds that play when certain events occur on screen. This is helpful for students who have trouble hearing some sounds—high or low-pitched sounds, for example, or sounds associated with other devices. To change sounds in Windows 8:

- Open Personalization by swiping in from the right edge of the screen, tapping **Search** (or if you're using a mouse, pointing to the upper-right corner of the screen, moving the mouse pointer down, and then clicking **Search**), entering **Personalization** in the search box, tapping or clicking **Settings**, and then tapping or clicking **Personalization**.

To change the sounds you hear when something happens on your computer, tap or click **Sounds**, tap or click an item in the **Sound Scheme** list, and then tap or click **OK**.

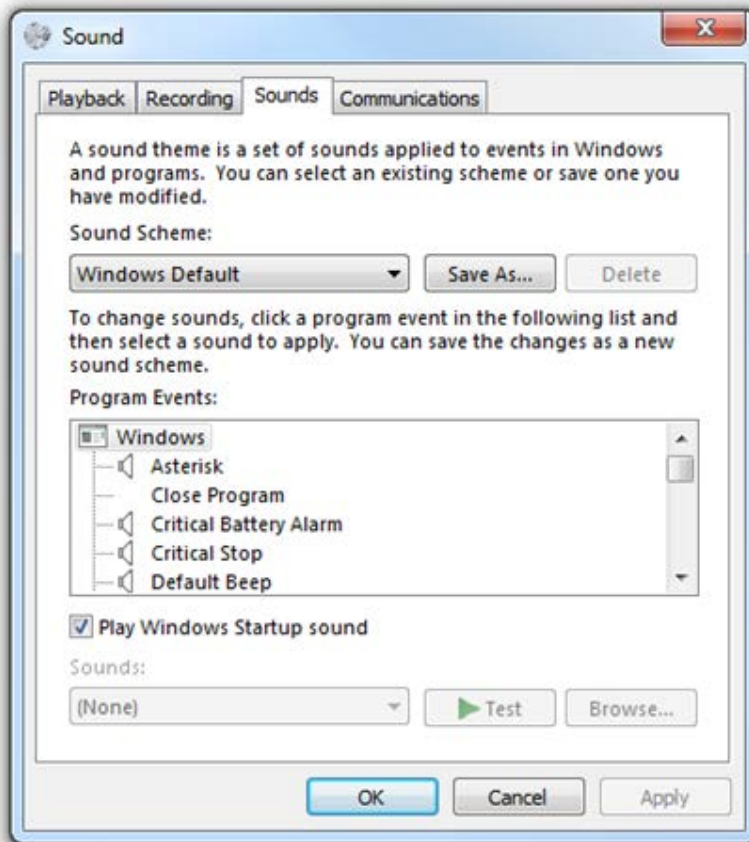


Figure 2-7. Sound options dialog box with Sounds tab open

Use Text or Visual Alternatives to Sounds

Windows 8 provides settings for using visual cues to replace sounds in many programs. You can adjust these settings on the **Use text or visual alternatives for sounds** screen in the Ease of Access Center.

1. Swipe in from the right edge of the screen, and then tap **Search**.
(If you're using a mouse, point to the upper-right corner of the screen, move the mouse pointer down, and then click **Search**.)
2. In the search box, enter **Replace sounds with visual cues**, tap or click **Settings**, and then tap or click **Replace sounds with visual cues**. Select the options that you want to use:
 - **Turn on visual notifications for sounds.** Use this option to set sound notifications to run when you log on to Windows. Sound notifications replace system sounds with visual cues, such as a flash on the screen, so that system alerts are noticeable even when they're not heard. You can also choose how you want sound notifications to warn you.
 - **Turn on text captions for spoken dialog.** Use this option (when available) to display text captions in place of sounds to indicate that activity is happening on your computer (for example, when a document starts or finishes printing).

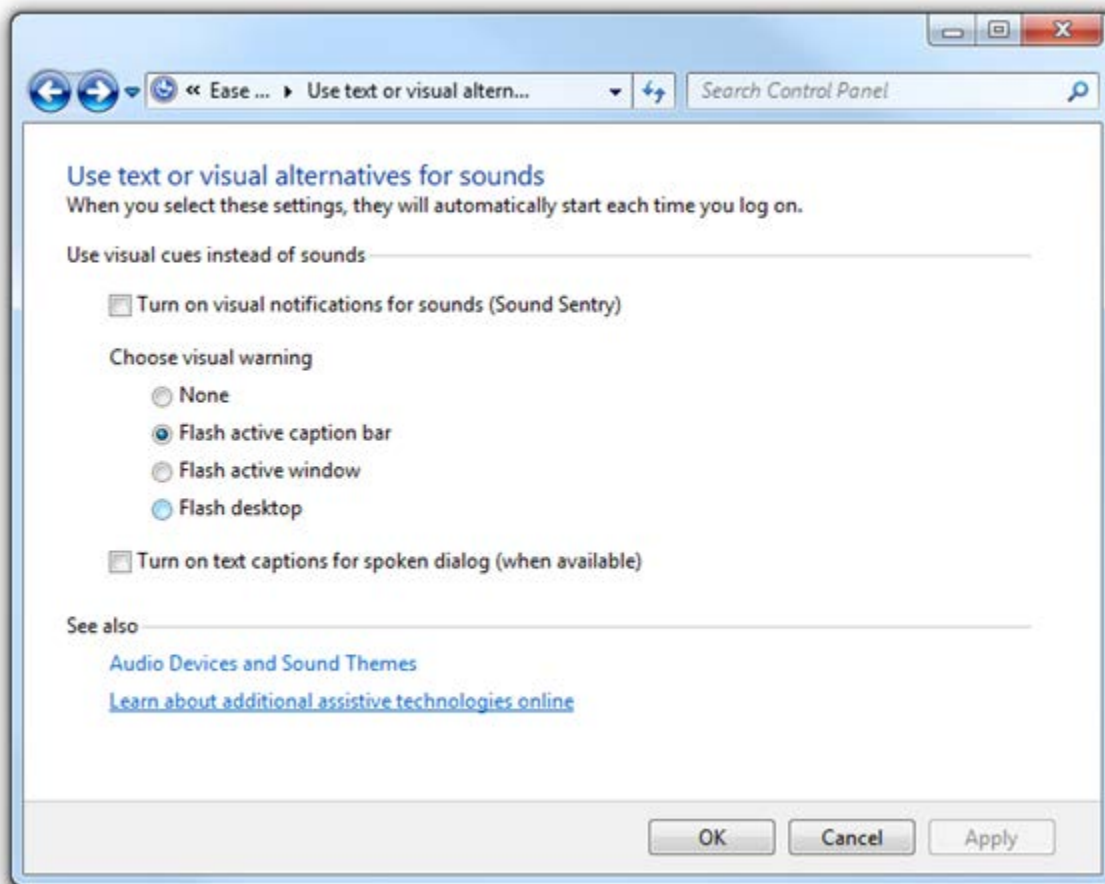


Figure 2-8. Use text or visual alternatives for sounds screen in the Ease of Access Center

Assistive Technology Products for Students with Hearing Impairments

Individuals with hearing impairments may need a classroom sign language interpreter or other accessibility solutions to be able to communicate actively in their classroom.

Personal listening devices and personal amplifying products can also be helpful for students with some hearing.

One product that may be useful for schools is iCommunicator—a graphical sign language translator that converts speech to sign language in real time to enable people who are deaf to communicate more easily with hearing people.

Depending on the learning environment, students may be able to use several Microsoft programs and apps to communicate. Microsoft Outlook, for example, can be used to transmit textual conversations. Instant messaging programs such as Microsoft Lync in Office 365 provide a real time conversational environment for students who are deaf. The [Skype app for Windows 8 and Windows RT](http://apps.microsoft.com/windows/en-US/app/skype/5e19cc61-8994-4797-bdc7-c21263f6282b)¹⁰ allows users to communicate by video using a webcam so students who communicate by sign language can readily interact.

¹⁰ <http://apps.microsoft.com/windows/en-US/app/skype/5e19cc61-8994-4797-bdc7-c21263f6282b>

Language Impairments

Language impairments include conditions such as aphasia (loss or impairment of the power to use or comprehend words, often as a result of brain damage), delayed speech (a symptom of cognitive impairment), and other conditions resulting in difficulties remembering, solving problems, or perceiving sensory information. For students who have these impairments, complex or inconsistent visual displays or word choices can make using computers more difficult. For most computer users, in fact, software that is designed to minimize clutter and competing objects on the screen is easier to use, more inviting, and more useful.


Some individuals with language impairments do not have the ability to communicate orally. These individuals can use augmentative and assistive communication devices to “speak” for them. To communicate, these individuals either type out words and phrases they wish to “say” or select from a series of images that, when arranged in a particular way, generate a phrase. For example, an individual could use the combination of a picture of an apple, a sandwich, and a carton of milk plus a lunch pail to communicate what she wants her mom to pack for lunch tomorrow.

Accessibility Features in Windows for Students with Language Impairments

Windows includes numerous features and options for students with language impairments. This section describes the features and options available in Windows 8 and how to access them. See Chapter 3 for more information on these features as well as accessibility features in other Microsoft products.

Make it Easier to Focus on Reading and Typing Tasks

You can use the settings on the **Make it easier to focus on tasks** screen in the Ease of Access Center in Windows 8 to reduce the amount of information on the screen and to help students focus.

1. In Windows 8, open the Ease of Access Center by pressing the Windows logo key +U. Under **Explore all settings**, select **Make it easier to focus on tasks**.
2. Then, select the options that are most helpful:
 - **Turn on Narrator.** Use this option to set Narrator to run when you log on to Windows. Narrator reads aloud on-screen text and describes some events (such as error messages appearing) while you're using the computer. For more information about using Narrator, see [Hear text read aloud with Narrator](http://windows.microsoft.com/en-US/windows-8/hear-text-read-aloud-with-narrator/) (<http://windows.microsoft.com/en-US/windows-8/hear-text-read-aloud-with-narrator/>).
 - **Remove background images.** Use this option to turn off all unimportant, overlapped content and background images to help make the screen easier to see.
 - **Turn on Sticky Keys.** Use this option to set Sticky Keys to run when you log on to Windows. Instead of having to press three keys at once (such as when you must press the Ctrl, Alt, and Delete keys together to log on to Windows), you can press one key at a time by turning on Sticky Keys and adjusting the settings. Then, you can press a modifier key and have it remain active until another key is pressed.
 - **Turn on Toggle Keys.** Use this option to set Toggle Keys to run when you log on to Windows. Toggle Keys can play an alert each time you press the Caps Lock, Num Lock, or Scroll Lock keys. These alerts can help prevent the frustration of inadvertently pressing a key.

- **Turn on Filter Keys.** Use this option to set Filter Keys to run when you log on to Windows. You can set Windows to ignore keystrokes that occur in rapid succession, or keystrokes that are held down for several seconds unintentionally.
- **Turn off all unnecessary animations.** Use this option to turn off animation effects, such as fading, when windows and other elements are closed.
- **Choose how long Windows notification dialog boxes stay open.** Use this option to choose how long notifications are displayed on the screen before they close—so you have adequate time to read them.
- **Prevent windows from being automatically arranged when moved to the edge of the screen.** Use this option to prevent windows from automatically resizing and docking along the sides of your screen when you move them there.

Assistive Technology Products for Students with Language Impairments

Some of the assistive technology products available from [independent technology companies \(www.microsoft.com/enable/at/\)](https://www.microsoft.com/enable/at/) used with computers by people with language impairments are:

- **Augmentative and assistive communication (AAC) devices.** These are used by individuals who cannot speak or who find speaking difficult. The user types in a word, phrase, or sentence to communicate—or selects a series of symbols or pictures on the device—and the device “speaks” aloud for the user. Often these devices are used to replace a PC keyboard. One example of an augmentative communication device is QualiSPEAK Pro.

Some apps, found in the [Windows Store](https://www.microsoft.com/windowsstore/) and available for download, provide augmentative communication capabilities. Mozzaz TalkingTILES (www.mozzaz.com) is an example. It’s an assistive communication and learning app that is fully customizable and can progress with a student’s development from K to 12. It delivers an integrated and coordinated learning environment accessible from any device. Teachers can remotely collaborate with other teaching professionals and support staff, to share data and teaching lessons, and to monitor progress through instant reports and dashboards for special needs students.

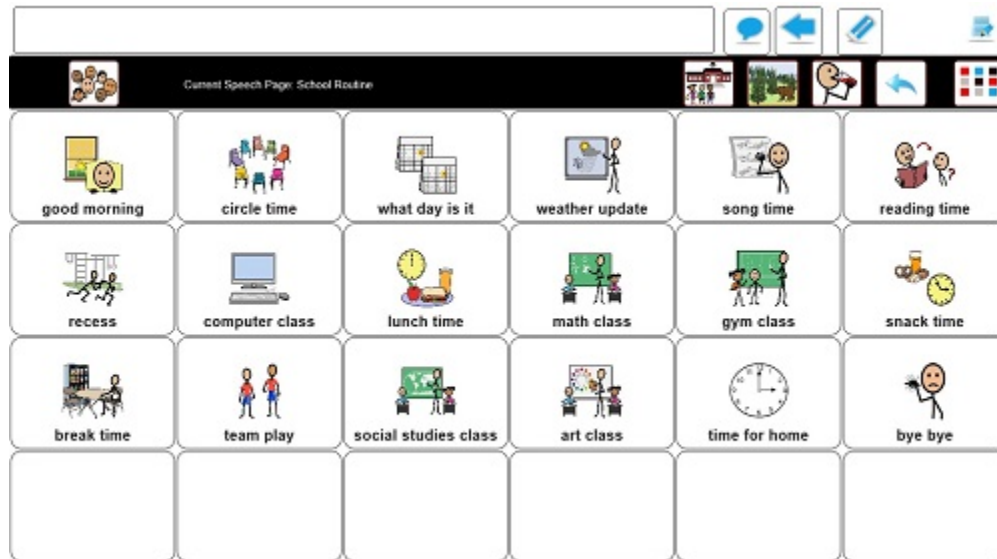


Figure 2-9. Screen shot of Mozzaz TalkingTILES showing an example of tiles that can be selected to communicate simple phrases or whole conversations

- Touchscreens.** These are monitors, or devices placed on top of computer monitors, that allow direct selection or activation of the computer by touching the screen. Touchscreens benefit people with mobility impairments, as well as people with language impairments. The ability to touch the computer screen to make a selection is advantageous for people with language and learning impairments because it is a simpler, more direct, and intuitive process than making a selection using a mouse or keyboard. With Windows 8 and a touchscreen monitor or tablet, such as [Microsoft Surface](http://www.microsoft.com/Surface/) (www.microsoft.com/Surface/), you can just touch your computer screen for a more direct and natural way to work. Use your fingers to scroll, resize windows, play media, and pan and zoom. Additional touchscreen technologies are available for Windows. The Gus Communicator PC10 Touch Screen Tablet PC is an example of an assistive technology product that can be used via touch to communicate.
- Speech synthesizers.** Defined earlier, these programs provide the user with information through a computer voice. Also known as text-to-speech (TTS), the speech synthesizer receives information in the form of letters, numbers, and punctuation marks, and then “speaks” it out loud to the user in a computer voice. Scan and Read Pro is an example of an assistive technology product that produces more natural sounding speech synthesis.

Chapter 3:

Accessibility in Microsoft Products

This chapter lists important accessibility features and options built into Microsoft products along with a brief description and links to further information. Products included are:

- Windows 8
- Internet Explorer 10
- Office 2013
- Office 365
- Lync 2013
- Microsoft Kinect for Xbox 360 and Kinect for Windows

More Information

Find product accessibility information, demos, tutorials, and more on the [Microsoft Accessibility Website](http://www.microsoft.com/enable/) (www.microsoft.com/enable/).

Accessibility in Windows 8

Windows 8 includes accessibility options and programs that make it easier to see, hear, and use your computer including ways to personalize your PC.

Magnifier now includes a lens mode and full-screen mode. On-Screen Keyboard can be resized to make it easier to see and includes text prediction. Windows 8 also gives you more ways to interact with your PC by taking advantage of new strides in speech recognition and touch technology.

Find more information about [Windows 8 accessibility](http://www.microsoft.com/enable/products/windows8/) (www.microsoft.com/enable/products/windows8/).

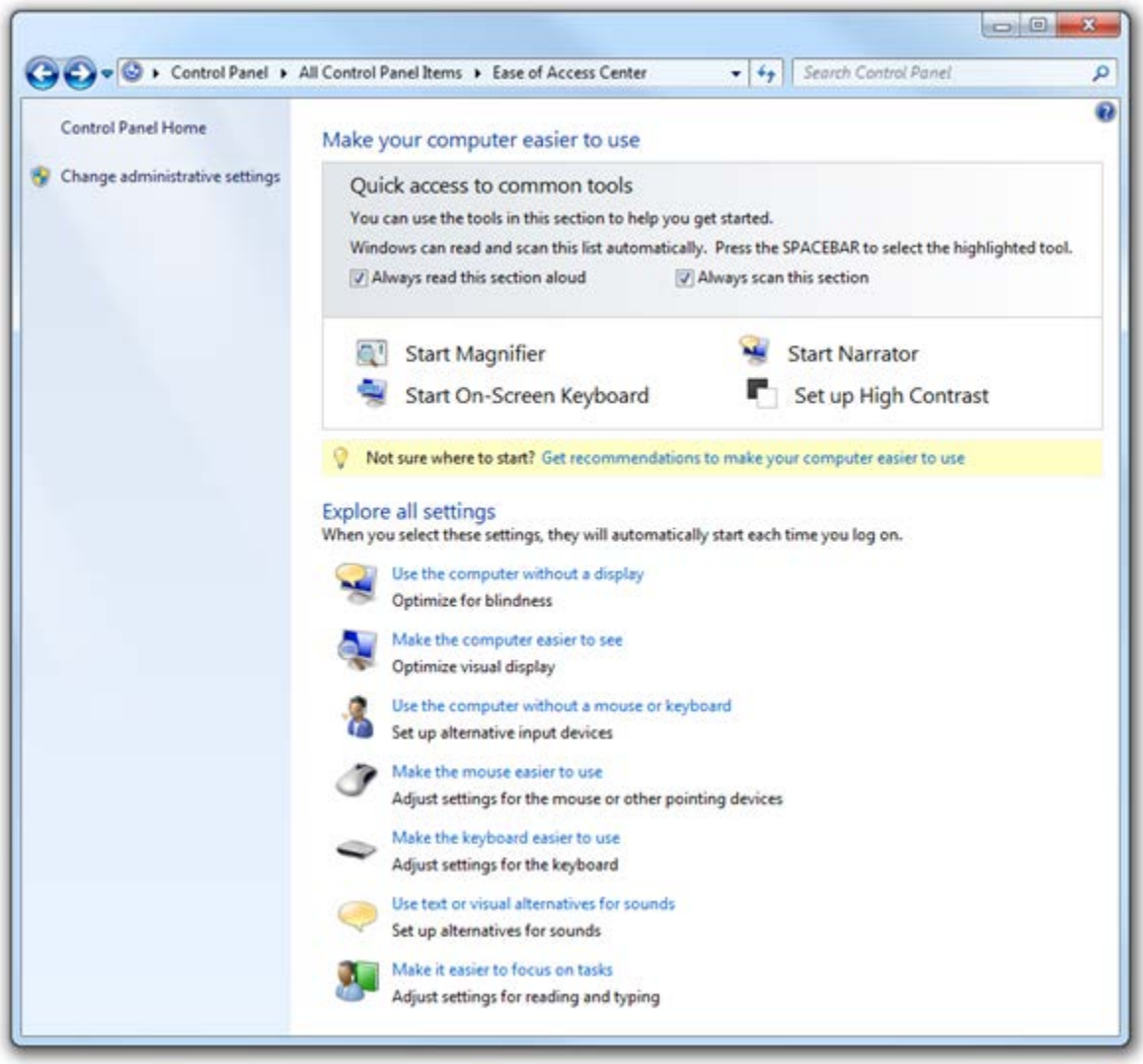



Figure 3-1. Windows 8 Ease of Access Center screen in Control Panel

Overview of Accessibility Features in Windows 8

Feature	Description
Ease of Access Center	<p>A central location to explore accessibility settings and programs to make your computer easier to use. The Ease of Access Center in Control Panel can be opened by selecting Windows logo key +U after you log on to Windows.</p> <p>The Ease of Access Center includes:</p> <ul style="list-style-type: none"> • Quick access to common tools. Start Magnifier, On-Screen Keyboard, Narrator, and High Contrast quickly. • Get recommendations to make your computer easier to use. An optional questionnaire provides a personalized list of recommended settings based on your answers to a series of questions about your eyesight, dexterity, hearing, and more. A custom list of recommended settings is provided so you can choose which options you want to try. • Explore all settings by category. Instead of looking for accessibility settings in various places, settings are organized so you can explore how to: <ul style="list-style-type: none"> – Make the computer easier to see – Use the computer without a display – Make the mouse easier to use – Make the keyboard easier to use – Use the computer without a mouse or keyboard – Use text or visual alternatives for sounds – Make it easier to focus on tasks
Magnifier	<p>Enlarges portions of the screen making it easier to view text and images and see the whole screen more easily. Magnifier in Windows 8 now includes full-screen mode, lens mode, and docked mode.</p> <p>The magnification quality is improved and you can set the magnification level up to 16 times the original size and choose to track what you magnify by movement of your mouse, the keyboard, or text editing. Options includes:</p> <ul style="list-style-type: none"> • Choose where Magnifier focuses so that it follows the movement of the mouse cursor, keyboard focus, or text editing • Change the zoom level • Set the zoom increment • Set the lens size • Turn on color inversion for better screen legibility • Display the Magnifier toolbar

Feature	Description
Make the text on your screen larger or smaller	Make the text and other items, such as icons, on your screen easier to see by making them larger. You can do this without changing the screen resolution of your monitor or laptop screen. This allows you to increase or decrease the size of text and other items on your screen while keeping your monitor or laptop set to its optimal resolution.
On-Screen Keyboard	<p>Displays a visual keyboard with all the standard keys. Instead of relying on the physical keyboard to type and enter data, you can use On-Screen Keyboard to select keys using the mouse or another pointing device.</p> <p>On-Screen Keyboard in Windows 8 can be resized and customized to make it easier to see and use. On-Screen Keyboard now also includes text prediction in eight languages. When text prediction is enabled, as you type, On-Screen Keyboard displays a list of words that you might be typing. Options include:</p> <ul style="list-style-type: none">• Change how information is entered• Set On-Screen Keyboard to use audible clicks• Use a numeric keypad• Enable text prediction
Speech Recognition	<p>Command your PC with your voice including the capability to dictate into almost any application. You can dictate documents, emails and surf the web by saying what you see. An easy setup process and an interactive tutorial are available to familiarize you with the speech commands and train your computer to better understand you. Options include:</p> <ul style="list-style-type: none">• Dictate text using Speech Recognition• Use the dictation scratchpad• Add or edit words in the Speech Dictionary• Use common commands
Windows Touch	With Windows 8 and a touchscreen monitor you can use your fingers to scroll, resize windows, play media, and pan and zoom.
Narrator	<p>Windows comes with a basic screen reader called Narrator that reads text on the screen aloud and describes some events (such as an error message appearing) that happen while you're using the computer. You can find Narrator in the Ease of Access Center. Options include:</p> <ul style="list-style-type: none">• Choose which text Narrator reads aloud• Change the Narrator voice• Start Narrator minimized
Keyboard shortcuts	Keyboard combinations of two or more keys that, when pressed, can be used to perform a task that would typically require a mouse or other pointing device. Keyboard shortcuts can make it easier to interact with your computer, saving you time and effort.

Feature	Description
Mouse Keys	Instead of using the mouse, you can use the arrow keys on the numeric keypad to move the pointer.
Sticky Keys	Instead of having to press three keys at once (such as when you must press the Ctrl, Alt, and Delete keys simultaneously to log on to Windows), you can press one key at a time when Sticky Keys is turned on.
Filter Keys	Ignore keystrokes that occur in rapid succession and keystrokes that are held down for several seconds unintentionally.
Visual notifications	Replace system sounds with visual cues, such as a flash on the screen, so system alerts are announced with visual notifications instead of sounds.
Captions	Get information via animations and video that some programs use to indicate that activity is happening on your computer.

Accessibility Through Windows Store Apps

In addition to the built-in accessibility features and options of Windows 8, you can download apps (<http://windows.microsoft.com/en-us/windows-8/apps/>) from the [Windows Store](http://windows.microsoft.com/en-us/windows-8/windows-store/) (<http://windows.microsoft.com/en-us/windows-8/windows-store/>) including many apps that either provide accessibility for people with disabilities (e.g. apps for augmentative communication, AAC) or have been designed to be compatible with other assistive technology. You can search specifically for apps that have been marked as accessible.

Note: Windows RT only supports the installation of apps through the [Windows Store](#)¹¹. Windows 8, or Windows 8 Professional, is required for individuals using assistive technology software or devices. Also, be sure to check with the [assistive technology manufacturer](http://www.microsoft.com/enable/at/) (www.microsoft.com/enable/at/) regarding compatibility with Windows 8 before purchasing a new device.

¹¹ About Apps in the Windows Store (<http://windows.microsoft.com/en-us/windows-8/windows-store/>)

Accessibility in Internet Explorer 10

The Internet is easier to see and explore with accessibility features and options in Internet Explorer 10. Internet Explorer 10 lets you select text and move around a webpage with the keyboard, makes it easier to copy and paste text from a webpage, and, lets you zoom in on a webpage. Enhanced keyboard access can also be found in the toolbar buttons, search box items, address bar, and tabs. Find more information on using these features at: www.microsoft.com/enable/products/ie10/.

Overview of Accessibility Features in [Internet Explorer 10](#)

Feature	Description
Zoom in on a webpage	Zoom lets you enlarge or reduce your view of a webpage. Unlike changing font size, zoom enlarges or reduces everything on the page, including text and images.
Make text larger or smaller	You can increase or decrease the font size on a webpage to make it more legible in Internet Explorer for the desktop.
Use the keyboard to surf the web	Press the Tab key to move forward, and Shift+Tab to move backward, through screen elements such as links that are text or images, text fields on website forms, hotspots on image maps, the address bar, the tabs bar, and more.
Change the font, formatting, and colors on webpages	Make webpages easier to see by changing the text, background, link and hover colors. Internet Explorer 10 supports the system link color, so High Contrast mode and color preferences you have chosen in Windows will work in Internet Explorer too.
Customize Internet Explorer 10 to work with a screen reader or voice recognition software	Some Internet Explorer 10 features can cause screen readers to give confusing or incorrect information, but you can customize to make them work more smoothly.
Select text and move around a webpage with the keyboard	Rather than using a mouse to select text and move around within a webpage, you can use standard navigation keys on your keyboard—Home, End, Page Up, Page Down, and the arrow keys. This feature is called Caret Browsing and is named after the caret—or cursor. This makes it easier to select, copy, and paste text to another document with a keyboard instead of a mouse. To use Caret Browsing, tap or click the Tools menu, tap or click File , and then tap or click Caret Browsing . Press F7 when Internet Explorer is open on your desktop to turn Caret Browsing on and off.
Simplify common tasks with Accelerators	Make tasks like copying, navigating, and pasting easier by using accelerators to save time and keystrokes. Accelerators help you quickly perform tasks without navigating to other websites to get things done. Highlight text from any webpage, and then click on the blue Accelerator icon that appears above your selection to obtain driving directions, translate and define words, email content, or search.

Feature	Description
Learn more about Internet Explorer 10 accessibility options	Visit: www.microsoft.com/enable/products/ie10/ .

Accessibility in Microsoft Office 2013

Microsoft Office 2013 makes it easier to create documents, spreadsheets, and presentations with rich content; and, finding commands you need is easier with the redesigned user interface. Find more information at www.microsoft.com/enable/products/office2013/.

Overview of Accessibility Features in Office 2013

Feature	Description
Accessibility Checker	With the click of a button in Word 2013, Excel 2013, and PowerPoint 2013 you can scan a document, spreadsheet, or presentation to identify areas that may be problematic for users with disabilities. The feature, called "Accessibility Checker," helps you create more accessible content. It highlights and explains accessibility issues, so you can fix them before the content is finalized. This is a great tool for educators to use before handing out digital files to their students.
Get quick access to frequently used commands in Backstage view	When you want to do things to a whole file like print, save, or open a different file, click the File tab (Alt+F) to go to the Microsoft Office Backstage view. This large view provides more detail about available commands and how to use them. This organization reduces keystrokes and searching, and makes navigation easier.
Zoom in or out of a document presentation, or worksheet for better visibility on screen	You can zoom in to get a close-up view of your file or zoom out to see more of the page at a reduced size. You can zoom either by selecting the slider bar in the zoom area of the status bar at the bottom of your document; or, on the View tab, in the Zoom group, click Zoom , and then enter a percentage.
Use the keyboard to work with ribbon programs	The menus and toolbars in all Office 2013 programs use the ribbon as in Office 2010. The ribbon contains all of the commands used in the program on a series of tabs across the top of the program. To move through the ribbon with a keyboard instead of a mouse, press F10 and then press Ctrl+Right Arrow or Ctrl+Left Arrow to move to the ribbon tab you want. You can also access any command in a few keystrokes by using keyboard shortcuts. Press F10 until the KeyTips appear, then select the number or letter next to the command you want.
Command your computer by voice	Speech recognition, which comes with Windows 8, enables you to move around your computer by using voice commands instead of the keyboard or mouse. To use Windows to dictate text and to control your computer by just saying what you see, click Control Panel , and type speech in the search box. Then click Windows Speech Recognition . As soon as Speech Recognition is set up, you can start it by saying Start listening .

Feature	Description
Use Read Mode for a clearer view	Use the new Read Mode in Word 2013 for a beautiful, distraction-free reading experience. Read Mode hides most of the buttons and tools so you can get absorbed in your reading without distractions. Press ALT+W, and then press the F key to open Read Mode. Also while in Read Mode you can double-click a picture to get an enlarged view. Click outside the image to return to reading.
Use Spelling and Grammar checker to verify your work	All Microsoft Office programs can check the spelling and grammar of your files. In Microsoft Word 2013, start the Spelling and Grammar checker by clicking Review , then clicking Spelling and Grammar .
Automatically correct spelling errors as you type	Correct typos and misspelled words as you compose by using the AutoCorrect feature in Office 2013. You can insert symbols and other pieces of text automatically as well. AutoCorrect automatically includes a list of typical misspellings and symbols, but you can modify the list to suit your needs.
Hear foreign text read aloud with Mini Translator	For those who receive email messages or documents that contain words in different languages, Microsoft Office 2013 features a Mini Translator that lets you point to a word or selected phrase with your mouse to display a translation in a small window. The Mini Translator also includes a Play button so you can hear an audio pronunciation of the word or phrase, and a Copy button so you can paste the translation into another document. The list of languages available in the Mini Translator depends on the language version of Office you are using. To learn more about translation language pairs, see Translate text in a different language .
Use the Speak text-to-speech feature	Text-to-speech (TTS) is the ability of your computer to play back written text as spoken words. Depending upon your configuration and installed TTS engines, you can hear most text that appears on your screen in Word 2013, Outlook 2013, PowerPoint 2013, and OneNote 2013. Just highlight the text you want to hear then click the Speak selected text icon (or, press Alt+the access key number).
Use the keyboard to work with SmartArt graphics	A SmartArt graphic is a visual representation of information—like a diagram—that you can use to enhance your documents and presentation. You can create SmartArt graphics in Excel, Outlook, PowerPoint, and Word, and you can copy and paste SmartArt graphics as images into other Office programs.

Feature	Description
Add alternative text descriptions to shapes, pictures, tables, and graphics	For people who cannot see shapes, pictures, tables and other objects in your documents, you should add a description to each using alternative, or Alt text. People who use screen readers will then hear a description of the pictures or object as they scan your document. The location to add Alt text has changed slightly in Office 2013. It used to be in the Format Object dialog box in Office 2010, but in Office 2013 it is now in the Format Object task pane. After inserting a photo, for example, the Format Picture Tools menu opens. On the right side under Format Picture, select the Layout and Properties icon and click ALT TEXT to display the text boxes used to describe the picture.
Create accessible web portals	Using SharePoint 2013 , you can set up websites to share information with others, manage documents from start to finish, and publish reports to help everyone make better decisions. SharePoint products include features that make the software easier for more people to use, including people who have low vision, limited dexterity, or other impairments. For example, SharePoint has keyboard shortcuts and access keys that let you do many things without a mouse. And, for people who use assistive technologies such as screen readers, SharePoint offers More Accessible Mode , a special feature that can create a different version of software elements, such as customized forms, if a screen reader can't handle the original element.
Create accessible Office files	Learn to create more accessible Word documents. You can add alternative text to images and objects, organize content so that it's easy for screen readers to follow, include captions for audio and video files. Also, learn how to create accessible Excel files by including alternative text for images and objects and specifying table headers. In PowerPoint, you can even add closed captions for audio and video.
Create accessible PDFs	Learn to tag PDF files so that screen readers and other assistive technologies can determine a logical reading order and navigation for large type displays, personal digital assistants (PDA) and mobile phones. Microsoft Office 2013 versions of Word, Excel, PowerPoint, and Visio all enable you to tag PDF files automatically when you save a file in PDF format.

Ideas for Educators¹²

Create a visual bank to help students learn to count and manipulate objects on screen. By inserting an image or clip art into a Word document, then replicating it by Copy/Paste, students can learn to add and subtract by moving objects around on screen rather than drawing, writing, or cutting and pasting on a hard copy. This activity can help students with learning and dexterity impairments.

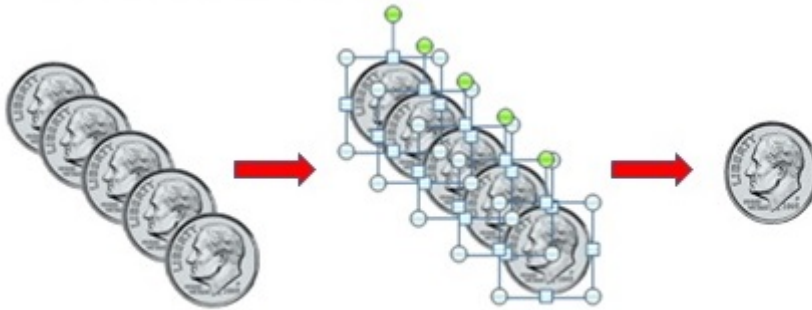


Figure 3-2. Illustration of coins on screen that can be manipulated by students to practice dexterity and counting skills

PowerPoint Hyperlinks. PowerPoint slides can be constructed with hyperlinks so that when text, graphics, or action buttons are hovered over or clicked on, another slide will be displayed within the presentation, or a website, or another document. This can be useful in allowing students to work at their own pace to study and learn the assigned material.

¹² Ideas in this section provided by Tara Jeffs, PhD, and Cynthia Feist, PhD, Assistive Technology Trainers, Loudoun County Public Schools

PowerPoint: Hyperlinking

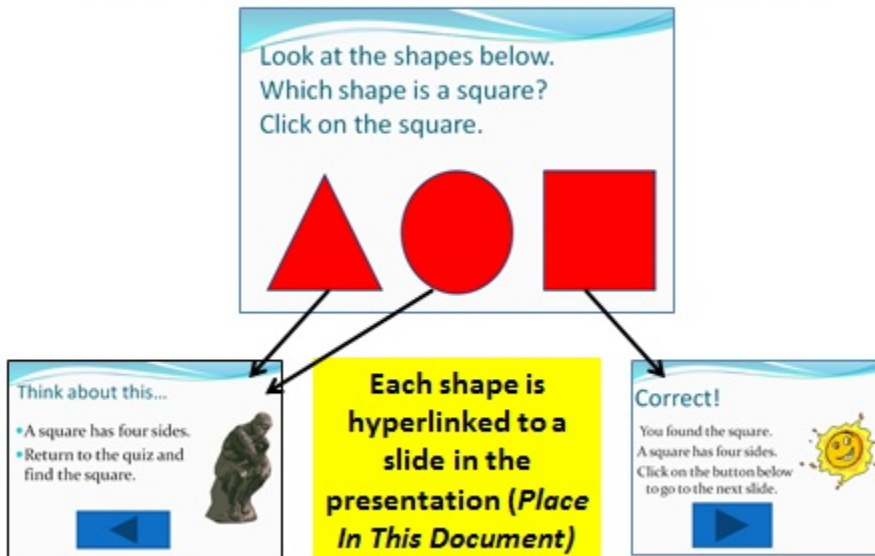


Figure 3-3. Screen shot of a PowerPoint slide with three shapes giving examples of what new slide would appear when a triangle, circle, or square was selected in answer to the instruction: "Look at the shapes below. Which shape is a square? Click on the square."

Enhance and embellish your documents. Students and teachers can quickly enhance and embellish documents with customizable charts, animations, sounds and more. These enhancements provide a visual representation of your information and ideas such as relationships, processes, and more. Inserting a SmartArt object in a Word 2013 document is as easy as clicking **Insert** and choosing pictures, shapes, SmartArt, charts, screen shots and even audio and video—anything that supports your point. In the example below, text can be added in each shape to replace the word "text."

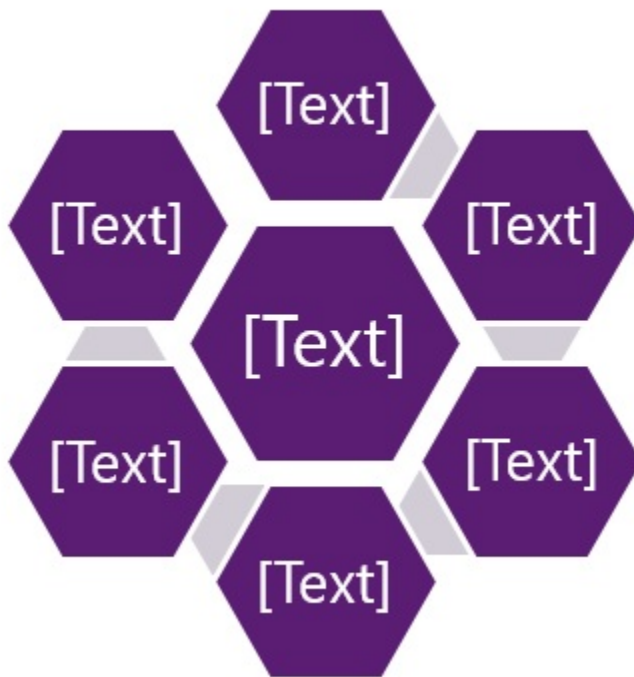


Figure 1-4. Diagram showing 6 text box shapes surrounding one in the center. Text can be inserted and sized within each of the shapes

Accessibility in Microsoft Office 365

[Microsoft Office 365](#) is an online subscription service that provides email, shared calendars, the ability to create and edit documents online, instant messaging, web conferencing, a public website for your organization, and internal team sites. Learn more about [Office 365 Education](#)¹³, and [Office Professional Plus](#)¹⁴.

Office 365 combines Office services including:

- Ability to access and edit Office files online with Office Web Apps
- Instant messaging, calls, and meetings with Lync Online
- Team document sharing and websites with SharePoint Online
- Email and calendaring with Exchange Online.

[Microsoft Office Web Apps](#), available in Office 365, allow you to access and edit files online in your web browser. Office Web Apps include a number of accessibility features and provide screen reader support, keyboard accessibility, and high contrast modes.

Overview of Accessibility Features in Microsoft Office 365 and Office Web Apps

Feature	Description
Support for assistive technology products	The Word Web App and PowerPoint Web App have display modes that make them accessible to screen readers. Those who use assistive technologies, such as screen readers or speech recognition software, will have the best experience in Office Web Apps if the assistive technology that you use supports WAI-ARIA (Web Accessibility Initiative-Accessible Rich Internet Applications).
Use familiar keyboard shortcuts	Keyboard shortcuts from the Office desktop applications such as Ctrl+B, Ctrl+S, and Ctrl+C all work as they do in Office on your desktop. You can also press the Tab key and Shift+Tab to move back and forth between elements on any page.
Read and edit Office files in your browser	Office Web Apps are web versions of Word, Excel, PowerPoint, and OneNote that let you read and edit documents right in your browser, and easily share those documents with others.
Use accessibility features in your web browser to improve accessibility of Office Web Apps	Office Web Apps run in a web browser so you can use your web browser's accessibility features to improve the readability and accessibility of Office Web Apps.

¹³ Office 365 Education: www.microsoft.com/en-us/office365/education/school-services.aspx

¹⁴ Office 365 Professional Plus: www.microsoft.com/en-us/office365/office-professional-plus.aspx

Work on and share Office documents with SkyDrive


Office Web Apps and SkyDrive let you access files from anywhere and share files with others. Office Web Apps are available for personal use in SkyDrive, for organizations that have installed and configured Office Web Apps on their SharePoint website, and for professionals and organizations that subscribe to select Office 365 services.

Feature	Description
Change how your screen appears	Most Office 365 components are viewed in a web browser so the accessibility features in Windows, Internet Explorer, and other browsers are utilized when you are using Office Web Apps. Learn how to make the computer easier to use to improve your Office 365 experience.
Use accessibility features of your browser to improve accessibility of Office Web Apps	Use accessibility features in Internet Explorer 10 to zoom in on a webpage and change the color and fonts used on webpages. If you're using a different browser, look for information in that browser's Help about how to customize your display to the size, fonts, and colors you prefer.

Accessibility in Microsoft Lync 2013

Microsoft Lync is an enterprise-ready unified communications platform. Lync connects people everywhere, on Windows 8 and other devices, as part of their everyday productivity experience. Lync provides a consistent, single client experience for presence, instant messaging, voice, video and a great meeting experience. Lync 2013 users can connect to anyone on [Skype](#)¹⁵, enabling rich communication with hundreds of millions of people around the world. Lync provides many accessibility features including keyboard navigation, high contrast, keyboard shortcuts, sharing notification, and screen reader support. Learn more about [accessibility in Microsoft Lync 2013](#), and read this TechNet blog describing [what's new in Lync 2013](#).

Overview of Accessibility Features in Microsoft Lync 2013

Feature	Description
Hear incoming messages read aloud	Incoming instant messages and “toast” notifications can be read aloud by screen readers. You’re also notified if your screen is being shared, and will be told the keyboard combination to access the sharing toolbar.
Expanded keyboard support	<p>Lync now offers more than 100 keyboard shortcuts for important functions, giving you direct access without a mouse. For example, you can now press Windows logo key+A to accept a call, or Windows logo key+Esc to decline an invite notification. You can also use your keyboard to end a call (Alt+Q), start OneNote (Ctrl+N), and open the Tools menu (Alt+T).</p> <p>Lync includes several frequently used keyboard shortcuts that make it easier to navigate and move between active windows. For example, Press Ctrl+1 to go to the Contact List tab in the main window, or press Ctrl+F to send a file from a conversation window.</p>
High Contrast support	Microsoft Lync provides support for high contrast color schemes you select in Windows. For more information, see High Contrast under Customizing the Ease of Access page (http://windows.microsoft.com/en-US/windows-8/make-pc-easier-use/)
Support for text and graphics scaling	Lync provides high DPI support, enabling you to scale text and graphics for 125% and 150% dots per inch. A Full Screen icon  lets you expand your Lync conversation window to fill the screen for better readability.
Enhanced screen reader support	Extensive screen reader support in Lync 2013 ensures that all notifications, incoming requests, and instant messages are read aloud so you’re always kept in the loop.
Magnification support	To view a portion of the Lync window larger, use magnification tools like Windows Magnifier (http://windows.microsoft.com/en-US/windows-8/use-magnifier-to-see-items/).

¹⁵ Windows Store information on Skype App: <http://apps.microsoft.com/windows/en-US/app/skype/5e19cc61-8994-4797-bdc7-c21263f6282b>

TTY support

Lync supports TTY (Telephone typewriter) communication. Once, TTY mode is turned on via **Lync > Options > Phone**, Lync can be used with a peripheral TTY device to communicate with a TTY enabled PSTN (public switched telephone network) endpoint.

Ideas for Educators



Microsoft Lync Aids Distance Learning

Microsoft Lync is helping students at the Washington State School for the Blind learn algebra and software programming remotely.

Read the article: [School for the Blind Bridges Distances with Microsoft Lync](#)

(www.microsoft.com/en-us/news/features/2011/dec11/12-08Lync.aspx)

View the video: [Distance Math Classes for the Blind and Visually Impaired on the Partners in Learning Website](#)

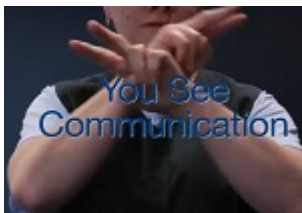
(www.pil-network.com/Resources/LearningActivities/Details/81BB7C33-1C4B-4EDF-9A5B-4C807CB39C07)

Read the article: [School for Blind Leads the Way in Distance Learning](#)

(<http://thejournal.com/Articles/2012/08/15/School-for-Blind-Leads-the-Way-in-Distance-Learning.aspx>)

Read the article: [Educators Win Awards for Cutting-Edge Use of Technology at Partners in Learning Global Forum 2012](#)

(www.microsoft.com/en-us/news/press/2012/dec12/12-03GlobalForumPR.aspx)



Microsoft Lync Aids Communication for Australian Organization

Learn about the deployment of Microsoft Lync for the Victorian Deaf Society. Incorporating Lync into their operations allowed for easier communication in Auslan (Australian sign language) all across Australia.

View the video: [VicDeaf Microsoft Lync Case Study](#)

(www.youtube.com/watch?v=XNnYlIF83bc)

Kinect in the Classroom: Engaging Students in New Ways

Teachers work hard to make their classroom a place where kids are actively involved in learning, instead of watching the clock and waiting for the bell to ring. They know that engagement is the key to unlocking the magic that lies within each student.

With either an [Xbox 360 console](#)¹⁶ and a [Kinect for Xbox 360 sensor](#)¹⁷, or a computer¹⁸ and a [Kinect for Windows sensor](#)¹⁹, educators are enhancing traditional lesson plans and after-school programs with attention-grabbing, body-moving experiences that help students get engaged and stay on task—while keeping instruction fun and rewarding for everyone. With either Kinect for Xbox 360, or Kinect for Windows, educators can:

- Create an interactive learning environment that connects students with subjects in exciting new ways
- Transform lesson plans into powerful, memorable experiences
- Break through learning barriers with fun, energetic, and easy-to-follow classroom activities
- Promote physical activity using the entire body as part of the learning process
- Promote an inclusive learning environment where students with impairments and disabilities can fully and enjoyably participate

Overview of Education Opportunities Using Kinect for Xbox 360 in the Classroom

All that's needed is an Xbox 360 console, a Kinect for Xbox 360 sensor, and a game that's been developed for this platform.

Feature	Description
Kinect for Xbox 360 lets students take center stage	Of all the challenges teachers face, motivating students to learn—truly capturing their attention and interest—ranks at the top of the list. With Kinect for Xbox 360, which applies full body engagement to standards-based content, teachers can put students in the center of the learning experience to make concepts come alive.

¹⁶ **Xbox 360** (<http://www.xbox.com/en-US/Xbox360>) is a video game console developed by and produced for Microsoft and is the successor to the Xbox console. See also: [Xbox One](http://www.xbox.com/en-US/xboxone/meet-xbox-one) (<http://www.xbox.com/en-US/xboxone/meet-xbox-one>).

¹⁷ **Kinect for Xbox 360** is a motion sensing input device by Microsoft for the Xbox 360 video game console. It enables users to control and interact with the Xbox 360 without the need to touch a game controller, through a natural user interface using gestures and spoken commands.

¹⁸ The Kinect for Windows sensor requires a **computer** with a 32-bit (x86) or 64-bit (x64) processor, dedicated USB 2.0 bus, 2GB RAM, and DirectX 11 compatible graphics card.

¹⁹ **Kinect for Windows** is a motion sensing input device by Microsoft. It enables users to communicate naturally with computers by simply gesturing and speaking, making it possible to interact with computers without the need to touch the device.

Feature	Description
Kinect for Xbox 360 can activate learning in the classroom and beyond	Kinect for Xbox 360 is a highly versatile and valuable learning tool with numerous applications. Teachers and program coordinators can tap a fast-growing portfolio of educational and entertainment titles that span academic disciplines, sports, and adventure scenarios to energize classroom and after-school activities. Students of varying abilities are enthusiastic participants—learning while having fun.
Avatar Kinect	Educators can also take advantage of Avatar Kinect (www.xbox.com/en-US/live/avatars/) ²⁰ to pursue unique opportunities for intra-school competitions, distance learning, and collaboration with colleagues, students, and parents. Students who are unable to be present in the classroom because of a permanent or temporary disability can participate in this way. And, because Kinect works with existing audio-visual equipment, such as televisions, projectors, and Smart Board systems, setup is fast and easy.

Overview of Education Opportunities Using Kinect for Windows in the Classroom

Kinect for Windows gives educational organizations the ability to develop and deploy classroom-based solutions that are designed for specific developmental needs with specific learning goals in mind. Several companies are building rich, customized applications that target students and educators. All that's needed is a computer, a Kinect for Windows sensor, and a Kinect for Windows application that's been created especially for students.

Feature	Description
With Kinect for Windows, solutions are being developed explicitly for classroom learning	Kinect for Windows puts the power of creation in the hands of Windows developers—giving education companies the freedom to create content that teaches traditional standards-based course work in new, immersive ways. This lets educators enhance their traditional learning with full-body experiences. Kinect for Windows educational solutions are built by educators for education.
Kinect for Windows is versatile, mobile, and affordable	All a school needs to take advantage of Kinect for Windows learning applications is a computer, a monitor, and a Kinect for Windows sensor—no extra equipment is necessary. Additionally, this equipment can be easily transported from classroom to classroom. This makes it affordable for many classrooms to benefit from this technology throughout the school day.

²⁰ Avatar Kinect for Xbox 360 is available to customers of Xbox Live (online service for Xbox 360). Find out more at: <http://www.xbox.com/en-US/live>

Kinect for Windows puts people first

Kinect for Windows gives computers eyes, ears, and the capacity to use them. With Kinect for Windows, students of all ages can naturally communicate with a computer by simply moving and speaking. Students can use their whole bodies to engage and learn—making concepts come alive and putting students at the center of the educational experience.

Ideas For Educators



Blended Learning with Kinect—See how teachers are using Kinect for Xbox 360 in their classrooms to engage students in learning through the use of a tool kids understand and welcome. From reading to math to physical education, teachers make lessons come alive through active participation. Special education teachers find students with social communications issues such as autism and emotional disabilities respond positively to the avatar Kinect environment.

View the video: www.youtube.com/watch?v=QRnOycG2WuI



The **Down Syndrome Corporation** adopted Microsoft Kinect for Xbox 360, which offers students the capability to interact with educational gaming content in a natural way—using body gestures and voice commands. Now, students with Down syndrome are developing math and reading skills, as well as hand-eye coordination, by using Kinect learning activities.

Read the case

study: www.microsoft.com/casestudies/Case_Study_Detail.aspx?CaseStudyID=710000000282

View the

video: http://mediadl.microsoft.com/mediadl/www/c/casestudies/Files/710000000282/Down_Syndrome_Corporation_128kbps.wmv



Lagoa Secondary School in Portugal is enriching classroom instruction while making learning activities more accessible for students with disabilities. Incorporating Kinect for Xbox 360 into its curriculum gives teachers exciting new ways to encourage learning, promote class cohesion, and empower students of all abilities to strengthen social skills and boost subject-matter proficiency—all while students learn and have fun.

Read the case study:

www.microsoft.com/casestudies/Xbox-360-Kinect-Sensor/Lagoa-Secondary-School/Students-with-Disabilities-Use-Innovative-Gaming-System-to-Interact-with-Curriculum/71000000393

View the

video: [http://mediadl.microsoft.com/mediadl/www/c/casestudies/Files/71000000393/Lagoa Kinect CS.wmv](http://mediadl.microsoft.com/mediadl/www/c/casestudies/Files/71000000393/Lagoa_Kinect_CS.wmv)



Alex's Place: Unique Cancer Treatment Center Uses Kinect for Windows to Help Put Kids at Ease

View the video:

http://www.youtube.com/watch?v=kXTlqPulb0&feature=player_embedded

Do more with Kinect: Kinect for Windows is a new vehicle to engage kids of all ages in learning new concepts and skills. This platform gives organizations the ability to develop and deploy classroom-based solutions that are designed for specific users with specific educational goals in mind—everything from early childhood education to adult training and simulation.

Several companies are building Kinect for Windows applications that target students and educators, which give people the power to communicate with computers simply by gesturing and speaking naturally.

See more examples of Kinect for Windows:

<http://www.microsoft.com/en-us/kinectforwindows/discover/gallery.aspx>

Chapter 4:

Selecting Accessible Technology

This chapter provides guidance on how to go about identifying accessibility solutions by providing a sample needs assessment tool, an assistive technology starter guide, and a list of accessibility consultants and other resources available to educators.

Improving the learning experience can mean different things to different individuals: having a multisensory experience of audio paired with a visual representation may benefit one student, while reducing visual and auditory distractions may be better for another. There are hundreds of types of accessibility solutions available—both built-in operating system and program features, and assistive technology hardware and software products—so it is important to take the time to identify the right mix of accessibility solutions for each student.

Identifying the best assistive technology solution often requires an in-depth needs assessment to understand how a difficulty or impairment impacts computer use. You can evaluate a student's needs through an assessment tool or provide assistive technology consultation with an AT expert before deciding what product or products you may wish to purchase. Following are ideas for both approaches.

Accessibility Consultants

Many schools and districts have accessibility and special education staff for student assessment. If your school doesn't have such resources available, some resources that may be helpful to you are listed here.

Assistive technology centers and occupational therapists often have accessibility consultants to help individuals identify the right mix of accessibility features and products. Some centers offer computer training and many organizations have lending libraries, so you can try a product before committing to purchase it.

In the United States

- **Microsoft Accessibility Resource Centers** (www.microsoft.com/enable/centers/marc.aspx) are available in the United States. These centers provide expert consultation on assistive technology and accessibility features built into Microsoft products.
- **The Alliance for Technology Access** (www.ataccess.org) and the **Assistive Technology Act Programs** (www.ataporg.org/) are other U.S. national networks dedicated to providing information and technology support services to children and adults with disabilities.
- **The Rehabilitation Engineering and Assistive Technology Society of North America**, known as RESNA, (www.resna.org) offers certification programs for assistive technology practitioners. RESNA is another source for identifying AT experts who can assist schools in North America.
- **The Assistive Technology Industry Association** (www.atia.org) provides online training and web seminars for learning specific types of assistive technology products.
- **HP's Guide to Selecting Assistive Technology** (www.hp.com/hpinfo/abouthp/accessibility/atproduct.html)

- **Dell, in collaboration with Intel**, provides access to, integration with, and support for assistive solutions.
 - **Access:** The Dell [Assistive Technology Configuration Tool](http://www.dell-at.com), (www.dell-at.com) developed by Dell and Electronic Vision Access Solutions (EVAS), helps you select best-in-class software and hardware aligned to the needs of your students.
 - **Integration:** The team will install, configure, and test assistive technology hardware, software, and peripherals.
 - **Support:** Dell's AT support staff and system engineers are available weekdays, 8 a.m.–8 p.m. ET via a dedicated toll-free service and have access to all assistive technology device specifications.
 - With its diverse, select group of [assistive technology partners](http://www.dell.com/spredir.ashx/k12/k12-ats-partner) (www.dell.com/spredir.ashx/k12/k12-ats-partner), Dell offers a single source for your assistive technology needs.

In Asia

- **Tokyo Information Technology Regional Support Center** for persons with disabilities (www.tokyo-itcenter.com/) delivers training, organizes IT support, and has an assistive technology (AT) exhibition room for people with disabilities.
- **Osaka IT Station** (www.itsapoot.jp/) provides work-related training, organizes IT support, and has an AT exhibition room for people with disabilities.

In Latin America

- **POETA Accessible Centers** in Latin America (www.poeta-accessible.org/en/what-is/2-poeta-accessible) deliver training in information and communications technology, civic education, and job readiness to thousands of at-risk youth and people with disabilities across Latin America and the Caribbean.

In Europe

- **AbilityNet** in the UK (www.abilitynet.org.uk/) ensures people with disabilities in the UK, whether as individuals or through supporting organizations, have accessible IT that enables and improves their lives. AbilityNet is the leading UK charity for computing and disability, and has a network of centers. A range of free resources are available from their website. AbilityNet also offers advice on web and software accessibility including user testing.
- **ONCE** The Spanish National Organization for the Blind (www.once.es) and its foundation, ONCE Foundation for Cooperation and the Social Integration of People with Disabilities in Spain, provide work-related training and employment for people with disabilities, and universal accessibility, promoting the creation of universally accessible environments, products, and services.
- **Enable Ireland** (www.enableireland.ie/) works in partnership with those who use its services to achieve maximum independence, choice, and inclusion in their communities. Enable Ireland runs a national assistive technology training service specializing in electronic assistive technology, providing advice and training on AT products to Enable Ireland service users and staff.
- **Charta 77/PCs without Barriers** in the Czech Republic (en.kontobariery.cz/) provides technology knowledge and support to those living with disabilities through 16 PC centers across the Czech Republic.

- **The Organization of People with Disabilities and Their Friends APEIRONS** in Latvia (www.apeirons.lv/) has a goal to integrate people with disabilities into society as well as creating more accepting attitudes towards them from the general public. The organization operates a lab in downtown Riga where people can take classes, learn about accessible technologies, and test various options.
- **The eCentrum project** in Poland (www.idn.org.pl/) specializes in the use of modern technologies in education and mobilization for those living with disabilities, creating e-learning and blended learning educational programs as well as desktop training at several locations throughout Poland.

Assistive Technology Decision Tree

The following **Assistive Technology Decision Tree**, by [Unum](http://www.unum.com/) (<http://www.unum.com/>), helps select assistive technology by leading you through a process of selecting impairment type, then level of functionality, and finally providing suggested technology. The table has been adapted from the original flowchart with permission from Unum. Download the original [Assistive Technology Decision Tree flowchart by Unum²¹](#).

Table 4-1. Assistive Technology Decision Tree – Range of Motion

Impairment	Level of Functionality	Suggested Technology
Range of Motion	Good range of motion-grasp and point	<ul style="list-style-type: none"> • Alternative pointing devices • Ergo keyboard • Movable numeric keypad • Electric office equipment • Touchscreen
Range of Motion	Point, but no grasp	<ul style="list-style-type: none"> • Alternative pointing devices • Over/undersized keyboard • Word prediction software • Voice integrated software • Wireless headset • Large button phone • Touchscreen
Range of Motion	No dexterity	<ul style="list-style-type: none"> • Foot mouse • Over/undersized keyboard • Movable numeric keypad • Electric office equipment • Macro writing software • Voice integrated software • Wireless headset • Telephone foot switch • Hands-free telephone

²¹ Download the Assistive Technology Decision Tree from the Microsoft Download Center: <http://download.microsoft.com/download/7/e/b/7ebfb5a1-69af-4e2a-aba7-7f11e2d66fed/atdecisiontree.pdf>

Impairment	Level of Functionality	Suggested Technology
Range of Motion	Moderate range of motion – grasp and point	<ul style="list-style-type: none"> • Auto-adjust workstation • Over/Undersized keyboard • Movable numeric keyboard • Electric office equipment • Arm/wrist supports • Articulated keyboard/mouse tray
Range of Motion	Point but no grasp	<ul style="list-style-type: none"> • Multiple mice • Over/undersized keyboard • Word prediction software • Voice integrated software • Arm/elbow supports • Articulated keyboard/mouse tray • Large button telephone
Range of Motion	Minimal range of motion or no dexterity	<ul style="list-style-type: none"> • Voice integrated software • Hands-free telephone • Wireless headset • Over/undersized keyboard • Foot mouse

Table 4-2. Assistive Technology Decision Tree – Quadriplegia

Impairment	Level of Functionality	Suggested Technology
Quadriplegia	Some upper extremity range of motion – grasp and point	<ul style="list-style-type: none"> • Alternative pointing devices • Ergonomic keyboard • Movable numeric keypad • Electric office equipment • Touchscreen
Quadriplegia	Point but no grasp	<ul style="list-style-type: none"> • Alternative pointing devices • Over/undersized keyboard • Word prediction software • Voice integrated software • Wireless headset • Large button phone • Touchscreen • Tape recorder notes • Scanner & software • OCR page reader • Tape recorder – phone

Impairment	Level of Functionality	Suggested Technology
Quadriplegia	Some lower extremity ROM	<ul style="list-style-type: none"> • Foot mouse • Phone foot switch • Micro writing software • Voice integrated software • Scanner & software • OCR page reader • Wireless headset • Hands-free telephone • Tape recorder – notes • Tape recorder – phone
Quadriplegia	No upper or lower ROM	<ul style="list-style-type: none"> • Voice integrated software • Wireless headset • Hands-free telephone • Over/undersized keyboard • Scanner & software • OCR page reader • Tape recorder – phone • Tape recorder – notes • Alternative pointing devices

Table 4-3. Assistive Technology Decision Tree – Back Impairment

Impairment	Level of Functionality	Suggested Technology
Back Impairment	Static position preferred	<ul style="list-style-type: none"> • Foot mouse • Ergo keyboard • Movable numeric keypad • Electric office equipment • Articulated keyboard/mouse tray
Back Impairment	Static position to be avoided	<ul style="list-style-type: none"> • Auto-adjust workstation • Ergo keyboard • Movable numeric keyboard • Electric office equipment • Articulated keyboard/mouse tray • Alternative pointing devices

Table 4-4. Assistive Technology Decision Tree – Visual Impairment

Impairment	Level of Functionality	Suggested Technology
Visual Impairment	Can see clearly	<ul style="list-style-type: none"> • High-resolution monitor • Glare guard
Visual Impairment	Can see monitor up close	<ul style="list-style-type: none"> • High-resolution monitor • Oversized monitor • Glare guard • Talking calculator • Telephone LED reader • Closed Circuit TV
Visual Impairment	Can see with enlarged type	<ul style="list-style-type: none"> • High-resolution monitor • Oversized monitor • Screen magnifier • Glare guard • Talking calculator • Telephone LED reader • Closed Circuit TV • Oversized keyboard • Large button phone
Visual Impairment	Uses other senses	<ul style="list-style-type: none"> • Screen reader • Braille display • Telephone LED reader • Talking calculator • OCR system • Tape recorder – telephone • Tape recorder – notes • Personal reader

Table 4-5. Assistive Technology Decision Tree – Auditory Impairment

Impairment	Level of Functionality	Suggested Technology
Auditory Impairment	Some audition	<ul style="list-style-type: none"> • Amplified telephone • Computer-aided note taking
Auditory Impairment	Little or no audition – deaf	<ul style="list-style-type: none"> • TTY/TDD • Light ringer • Kinetic beeper • Real time captioning • Computer-aided note taking • Personal translator

Table 4-6. Assistive Technology Decision Tree – Speech Impairment

Impairment	Level of Functionality	Suggested Technology
Speech Impairment	Some speech	<ul style="list-style-type: none"> • Assisted comm. device • Voice synthesizer - Computer • Voice synthesizer – Larynx
Speech Impairment	Little or no speech	<ul style="list-style-type: none"> • TTY/TDD • Assisted communication device • Voice synthesizer – computer • Voice synthesizer – Larynx

Table 4-7. Assistive Technology Decision Tree – Psych Impairment

Impairment	Level of Functionality	Suggested Technology
Psych Impairment	Inability to focus/maintain concentration	<ul style="list-style-type: none"> • Oversized monitor • Task organization software • Graphical idea tree • Palm Pilot • White noise generator
Psych Impairment	Cognitive impairment	<ul style="list-style-type: none"> • Alternate pointing devices • Word prediction software • Tape recorder – phone • White noise generator

Assistive Technology Product Starter Guide

The following tables provide lists of assistive technology hardware and software products by category. Specific examples of the assistive technology products are provided. The table is by no means exhaustive or an endorsement of these products but is provided as a sampling of what is available today. These types of assistive technology products are also referenced in the assistive technology decision tree.

Purchasing Assistive Technology

The Enablemart website (www.enablemart.com/) is one source where you can purchase assistive technology products for schools. Another is Boundless Assistive Technology (www.boundlessat.com/) Education and government customers may be eligible for volume pricing. See also [Assistive Technology Products for Windows](http://www.microsoft.com/enable/at/matvplist.aspx) (www.microsoft.com/enable/at/matvplist.aspx) for links to assistive technology manufacturers.

Table 4-8. Assistive Technology – Hardware Products

Product Type	Vision	Mobility	Hearing	Language	Learning	Example
Amplified phone			•			Clarity JV35
Augmentative communication device				•		Accent 700SB
Augmentative communication app for Windows 8				•		Mozzaz TalkingTILES
Alternative input		•				HeadMouse Extreme or Tracker Pro
Alternate keyboard	•	•		•		ZoomText Large-Print Keyboard and Orbitouch Keyless Keyboard
Alternative mouse or pointing device						BigTrack
Braille display	•					Eurobraille Esys 12 Braille Display
Braille printer	•					Emprint™ SpotDot
DAISY reader	•					Victor Reader Stream
Ergonomic keyboard		•				Microsoft Natural Ergonomic Keyboard 4000
Foot mouse		•				Footime™ Foot Mouse
Hands-free telephone		•				QualiPHONE*
High-resolution monitor	•					HP w1858 18.5" Diagonal Monitor
Large-button phone	•	•				Clarity JV35
Listening aid			•			Motiva™ Personal FM System
Monitor glare guard	•					Fellowes Anti-glare Screen

Product Type	Vision	Mobility	Hearing	Language	Learning	Example
Movable numeric keypads		•				Maxim Low-Force Keypad (USB)
Notetaker	•				•	Livescribe Pulse Smartpen and GW Sense Navigation
One-handed keyboard		•				Maltron One-Handed Keyboard
Optical character recognition system	•				•	Scan and Read Pro**
Oversized or undersized keyboard		•				BigKeys LX and WinMini
Oversized monitor	•					HP w2338h 23" Diagonal
Scanner	•				•	Scan N Talk Ultra
Screen magnifier/magnifier	•					Merlin Desktop LCD CCTV
Switch		•		•		Big Red Twist Switch
Talking calculators	•				•	Sci-Plus 300 Large Display Talking Calculator
Touchscreens		•		•	•	Dell S2340T 23" Multi-Touch Monitor
TTY			•			Compact/C
Voice synthesizer/ Speech to text	•		•	•	•	TextSpeak TS Wireless AAC Speech Generator and iCommunicator***

* Requires PC to phone line connection ** Requires flatbed scanner (e.g. Scan N Talk Ultra)

***Requires installation on a PC

Table 4-9. Assistive Technology – Software Products

Product Type	Vision	Mobility	Hearing	Language	Learning	Example
Braille translator	•					Duxbury Braille Translator
Communication aid				•		Overboard
Graphical idea trees					•	Read & Write GOLD
Macro writing software					•	ClaroRead Standard
On-screen keyboard		•				ScreenDoors and SofType
Reading aid	•					gh Player 2.2
Scanner software	•				•	Scan N Talk Ultra
Screen magnifier	•					ZoomText v9.1
Screen readers	•					Window-Eyes v8.1
Speech recognition/Voice dictation					•	Dragon Naturally Speaking Preferred
Talking calculators	•				•	Sci-Plus 300 Large Display Talking Calculator*
Task organizer software	•	•	•	•	•	MyLifeOrganized
Voice synthesizer/Speech to text	•		•	•	•	TextSpeak TS Wireless AAC Speech Generator and iCommunicator
Word prediction software					•	Read & Write GOLD and ClaroRead Standard

* Includes a large-display calculator

Resources

Resources from Microsoft

Microsoft's mission is to enable people and businesses throughout the world to realize their full potential. Computer technology is an important and powerful tool that enables and empowers individuals of all abilities. At Microsoft, we strive to develop technology that is accessible and usable by everyone, including individuals who experience the world in different ways because of impairments or disabilities.

For two decades, we have been exploring and evolving accessibility solutions that are integrated with our products. Microsoft's accessibility work is a part of Microsoft Trustworthy Computing (www.microsoft.com/mscorp/twc/) business practices, which focus on integrity and responsibility.

Microsoft Accessibility Website www.microsoft.com/enable/

- Accessibility Update newsletter www.microsoft.com/enable/news/subscribe/
- Accessibility in Microsoft Products www.microsoft.com/enable/products/
- Accessibility Tutorials www.microsoft.com/enable/training/
- Accessibility Demos www.microsoft.com/enable/demos/
- Assistive Technology Products www.microsoft.com/enable/at/
- Microsoft Accessibility Resource Centers www.microsoft.com/enable/centers/

Microsoft Education Web Resources

- Accessibility in the Classroom
www.microsoft.com/education/en-us/teachers/guides/Pages/Accessibility.aspx
- Microsoft in Education
www.microsoft.com/education/
- Daily Edventures Blog
<http://dailyedventures.com/>
- Partners in Learning Network
<http://pil-network.com/>
- Partners in Learning Network Hot Topic – Accessibility
www.pil-network.com/HotTopics/accessibility
- Online Training
 - Teaching with Technology
www.pil-network.com/pd/twt/Overview
 - Windows in the Classroom
www.pil-network.com/pd/course/wic

Additional Resources and Annual Conferences

Teaching Children with Disabilities in Inclusive Settings

www2.unescobkk.org/elib/publications/243_244/

This toolkit published by UNESCO provides activities for embracing diversity in the classroom.

Annual Conferences About Accessible Technology

The following organizations host annual accessible technology conferences.

- Assistive Technology Industry Association
www.atia.org
- Technology and Persons with Disabilities Conference at CSUN
www.csun.edu/cod/conf/
- Rehabilitation Engineering and Assistive Technology Society of North America
www.resna.org
- National Association of Special Education Teachers at www.naset.org.

Glossary of Terms

Accessible technology—software and hardware that is flexible and adjustable to a person’s visual, mobility and dexterity, hearing, language and learning needs and can therefore be accessed by persons regardless of their abilities. Accessibility encompasses three elements: built-in accessibility features, assistive technology products that provide access to computers for people with specific disabilities, and, compatibility between the operating system, software and the assistive technology products.

App—abbreviated form of "application," a type of software program that typically interacts with the end user, such as a calendar program, game, or a chat program. Apps differ from other software programs such as device drivers, which are mostly invisible to the user.

Assistive technology—hardware and software programs and devices (such as screen readers and voice recognition products), which are chosen specifically to accommodate an individual’s impairment or disability. They are “added onto” or, used with, a computer’s operating system such as Windows 8.

Disability—used in this guide to refer to a physical, cognitive, mental, sensory, emotional, developmental condition (or some combination), that makes it more difficult for a person to see, hear, or use a computer (See also “impairment”).

High Contrast color scheme—an accessibility option that heightens the color contrast of some text and images on a computer screen. Particular color schemes make items more distinct and easier to see by certain individuals with vision impairments, and can help reduce eye strain for some computer users.

Impairment—a physiological, psychological, or environmental condition, either permanent or temporary, which makes it more difficult for a person to see, hear, or use a computer. (See also “disability”)

Inclusive learning—designing the learning environment so that the individual needs of students are met so they can effectively participate with their peers.

Magnifier—an accessibility feature included in Windows 8 and earlier versions of Windows. It makes the computer screen more readable by people who have low vision by enlarging a portion or all of the screen. The Magnified window can be positioned and otherwise adjusted to meet individual needs.

Microsoft Accessibility—design features and options in Microsoft products that enable all persons to effectively use computers. It also encompasses the teams throughout Microsoft that focus on the accessibility needs of individuals of all ages and abilities and making Microsoft products easier to use for all. Also, the [Microsoft Accessibility website \(www.microsoft.com/enable/\)](http://www.microsoft.com/enable/)

Microsoft accessibility features—the features and options included in Microsoft Windows and products such Microsoft Office, Internet Explorer, and Lync that enable all people to effectively and comfortably use them. Computer technology that enables individuals to adjust a computer to meet their vision, hearing, dexterity and mobility, learning, and language needs.

Microsoft Kinect for Xbox 360—Kinect for Xbox 360 is a motion sensing input device by Microsoft for the Xbox 360 video game console. It enables users to control and interact with the Xbox 360 without the need to touch a game controller, through a natural user interface using gestures and spoken commands..

Microsoft Kinect for Windows—Kinect for Windows is a motion sensing input device by Microsoft. It enables users to communicate naturally with computers by simply gesturing and speaking, making it possible to interact with computers without the need to touch the device.

Microsoft Lync 2013—Microsoft Lync 2013 is an enterprise-ready unified communications platform. Lync connects people everywhere, on Windows 8 and other devices, as part of their everyday productivity experience. Lync provides a consistent, single client experience for presence, instant messaging, voice, video and a great meeting experience.

Microsoft Office—Microsoft Office is a collection of applications (programs) used at home, school, and in businesses to produce documents, spreadsheets, and presentations; to communicate through email; to collaborate with others; to publish websites and print materials, and more. Office includes these and other programs: Word, Excel, PowerPoint, Outlook, Access, Lync, SharePoint Server, Office 365, Project, OneNote, Publisher, and Visio.

Microsoft Office 365—Microsoft Office 365 is an online subscription service that provides email, shared calendars, the ability to create and edit documents online, instant messaging, web conferencing, a public website for your organization, and internal team sites.

Microsoft Windows—the latest operating system from Microsoft. It comes in several versions:

- **Windows 8**—includes the desktop that you're used to—with its taskbar, folders, and icons—is still here and better than ever, with a new taskbar and streamlined file management. Windows 8 starts up faster, switches between apps faster, and uses power more efficiently than Windows 7.
- **Windows RT**—a version of Windows that runs on some tablets and PCs. Windows RT comes with Microsoft Office Home & Student 2013 RT. This version of Office is optimized for touchscreens and automatically updates so you always have the latest version **Note:** You can't install Windows RT on your current PC. You can only get it by buying a Windows RT PC.
- **Microsoft Surface**—a touchscreen tablet made by Microsoft available in these versions:
 - **Surface Pro**—a powerful PC in tablet form compatible with the broadest range of peripherals and software. It includes a full 3.0 USB port. It can run the full Office Suite and desktop apps, such as Quicken and Adobe Photoshop and can be connected to some assistive technology.
 - **Surface RT**—loaded with Office Home & Student 2013 RT it includes versions of Word, PowerPoint, Excel, and OneNote optimized for touch. **Note:** It is not compatible with third-party assistive technology software.

Narrator—a text-to-speech accessibility feature in Windows 8 and earlier versions of Windows designed for people who are blind or have low vision. Narrator reads the text displayed on the screen, the contents of the active window, menu options, or text that has been typed.

On-Screen Keyboard—an accessibility feature included in Windows 8 and earlier versions of Windows. It displays a visual keyboard on screen. Letters can be typed by selecting keys using a mouse or another pointing device—rather than a physical keyboard. On-Screen Keyboard can be resized, moved around the computer desktop, and otherwise customized to meet individual needs. It includes text prediction in eight languages.

Operating system—software that manages computer hardware resources and provides common services for the computer programs that operate on that system (e.g. Microsoft Windows 8).

Partners in Learning Network—a global community of educators dedicated to improving student learning worldwide.

Personalized learning—the personalized design of curriculum, teaching tools, accessible and assistive technology to help individual students achieve their maximum potential.

TTY (Telephone typewriter)—a series of devices developed to allow hearing impaired individuals to use PSTN networks to exchange text information. These devices, called TTY (Telephone typewriter) or TTD (telecommunications device for the deaf), operate by converting user entered text to series of tones that are passed over the PSTN (public switched telephone network) network and interpreted and displayed as text to the receiver. These TTY devices work either by attaching to the handset and generating/receiving tone acoustically, or by replacing the handset. In a VoIP (voice over Internet Protocol) solution, these TTY tones are carried as in-band audio payload type, unlike DTMF (dual-tone multi-frequency), which is usually sent in a separate payload type.

Links

The following list of hyperlinks used within this document is current at the time of publication. If subsequently changed, you may be able to find the updated link by using the title phrase below in your Internet search.

Windows 8

- **Accessibility in Windows 8**
www.microsoft.com/enable/products/windows8/
- **Ease of Access Center – Make your PC easier to use**
<http://windows.microsoft.com/en-US/windows-8/make-pc-easier-use/>
- **Magnifier – Use Magnifier to see items on screen**
<http://windows.microsoft.com/en-US/windows-8/use-magnifier-to-see-items/>
- **On-Screen Keyboard – Use the On-Screen Keyboard (OSK) to type**
<http://windows.microsoft.com/en-US/windows-8/type-with-the-on-screen-keyboard/>
- **Speech Recognition**
<http://windows.microsoft.com/en-US/windows-8/using-speech-recognition/>
- **Windows Touch – Touch: swipe, tap, and beyond**
<http://windows.microsoft.com/en-US/windows-8/touch-swipe-tap-beyond/>
- **Narrator – Hear text read aloud with Narrator**
<http://windows.microsoft.com/en-US/windows-8/hear-text-read-aloud-with-narrator/>
- **Keyboard shortcuts**
<http://windows.microsoft.com/en-US/windows-8/keyboard-shortcuts/>
- **Mouse Keys – Use the numeric keypad to move the mouse pointer**
www.microsoft.com/enable/training/windows8/use-numeric-keypad.aspx
- **Sticky Keys – Change keyboard settings**
www.microsoft.com/enable/training/windows8/change-keyboard.aspx
- **Filter Keys – Change keyboard settings**
www.microsoft.com/enable/training/windows8/change-keyboard.aspx
- **Visual Notifications – Use text or visual alternatives to sounds**
<http://windows.microsoft.com/en-US/windows-8/use-visual-alternatives-to-sounds/>
- **Captions – Use text or visual alternatives to sounds**
<http://windows.microsoft.com/en-US/windows-8/use-visual-alternatives-to-sounds/>
- **Windows Store – Overview of Windows 8 Apps**
<http://windows.microsoft.com/en-us/windows-8/windows-store/>

Office 2013

- **Accessibility in Microsoft Office 2013**
www.microsoft.com/enable/products/office2013/default.aspx
- **Use Read Mode for a clearer view – Accessibility features in Word**
<http://office.microsoft.com/en-us/word-help/accessibility-features-in-word-HA102748896.aspx?CTT=1>
- **Use Spelling and Grammar checker to verify your work**
<http://office.microsoft.com/en-us/word-help/check-spelling-and-grammar-HA102809598.aspx>
- **Automatically correct spelling errors as you type**
<http://office.microsoft.com/en-us/word-help/autocorrect-spelling-and-insert-text-and-symbols-HA010354277.aspx?CTT=1>
- **Hear foreign text read aloud with Mini Translator**
<http://office2010.microsoft.com/en-us/word-help/see-translations-with-the-mini-translator-HA010356733.aspx?CTT=5&origin=HA010354288>
- **Translate text in a different language**
<http://office.microsoft.com/en-us/word-help/translate-text-in-a-different-language-HA010354288.aspx?CTT=5&origin=HA010356733>
- **Use the Speak text-to-speech feature**
<http://office.microsoft.com/en-us/onenote-help/using-the-speak-text-to-speech-feature-HA102066711.aspx>
- **Use the keyboard to work with SmartArt graphics**
<http://office.microsoft.com/en-us/word-help/keyboard-shortcuts-for-smartart-graphics-HA102749365.aspx>
- **Create SmartArt graphics**
http://office.microsoft.com/en-us/word-help/create-a-smartart-graphic-HA102749471.aspx?CTT=1#_Toc261348989
- **Add alternative text descriptions to shapes, pictures, tables, and graphics**
<http://office.microsoft.com/en-us/excel/add-alternative-text-to-a-picture-shape-chart-table-or-smartart-graphic-HA103220865.aspx?redir=0>
- **Create accessible web portals**
<http://office.microsoft.com/en-us/sharepoint-server-help/accessibility-features-in-sharepoint-products-HA102772892.aspx?CTT=1>
- **What's new in Microsoft SharePoint Server 2013**
<http://office.microsoft.com/en-us/support/whats-new-in-microsoft-sharepoint-server-2013-HA102785546.aspx?CTT=1>
- **More accessible mode in SharePoint**
http://office.microsoft.com/en-us/sharepoint-server-help/accessibility-features-in-sharepoint-products-HA102772892.aspx?CTT=1%20-%20_Toc346615672
- **Create accessible Office files**
<http://office.microsoft.com/en-us/word-help/creating-accessible-word-documents-HA101999993.aspx?CTT=3>

- **Create accessible Excel workbooks**
<http://office.microsoft.com/en-us/excel-help/creating-accessible-excel-files-HA102013545.aspx?CTT=3>
- **Create accessible PDFs**
<http://office.microsoft.com/en-us/support/create-accessible-pdfs-HA102478227.aspx?CTT=1>

Office 365

- **Accessibility in Office 365**
www.microsoft.com/enable/products/office365/
- **Use familiar keyboard shortcuts in Office Web Apps**
<http://office.microsoft.com/en-us/web-apps-help/accessibility-features-in-office-web-apps-HA010380212.aspx>
- **Read and edit Office files in your browser with Office Web Apps**
<http://office.microsoft.com/en-us/web-apps-help/access-office-documents-in-microsoft-office-web-apps-HA102528054.aspx>

Lync 2013

- **TechNet blog: What's New in Lync 2013**
<http://blogs.technet.com/b/lync/archive/2012/08/03/what-s-new-in-lync-2013.aspx>
- **Accessibility in Microsoft Lync 2013**
<http://office.microsoft.com/en-us/lync-help/lync-accessibility-for-people-with-disabilities-HA103010544.aspx>

Internet Explorer 10

- **Accessibility in Internet Explorer 10**
www.microsoft.com/enable/products/ie10/
- **Internet Explorer Accessibility Options**
<http://windows.microsoft.com/en-us/internet-explorer/ie-accessibility-options/>

