Augmentative and Alternative Communication (AAC):

Visual and Environmental Considerations

PaTTAN
Pennsylvania Training and Technical Assistance Network

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The purpose of this framework is to help school teams assess a student's ability to visually access a communication system/display and to address the impact of environmental issues. In situations where additional information concerning a student's visual functioning is needed, the services of a teacher of students with visual impairments may be explored. The school team should also incorporate information from the family concerning results of a recent comprehensive eye examination conducted by an eye care specialist.

Issue	Description	Questions to Ask	Suggested Adaptations
Lighting (Type)	A student's visual performance may improve under different lighting conditions.	Which type of light is best for the student in various situations? (Incandescent, fluorescent, LED, halogen, natural, etc.)	Provide preferred type of light for student use.
Lighting (Indirect vs. Direct)	Indirect or ambient light may cause glare problems. Direct light may increase contrast.	Does the student's visual performance improve when a direct light source is provided?	Provide flex-arm, gooseneck, etc., clip-on or mounted direct light source for the student.
Lighting (Amount)	The intensity of the light source may impact visual performance.	Does the student's visual performance improve under high or low levels of lighting?	Use rheostats or environmental modifications to control amount of light.
Lighting (Direction)	Visual performance may be affected by shadows or glare depending on the direction from which the light is coming.	• Does the student's visual performance improve if the direct light source is coming from the left, right, or above? • Does the student's visual performance improve with window light coming from behind, left, or right?	• Control the direction of the direct light source. • Select a location for the student's seating that best utilizes indirect lighting on materials.
Lighting (Glare)	Under certain conditions, light reflecting off visual materials may cause a decrease in visual performance.	Ask yourself: • When I position my face where the student's face will be, do I perceive glare? • When the student's position or environment changes, is there a change in the level of visual performance?	• If glare is present it may often be eliminated by simply repositioning the direct light source, the visual material, or the student. • Provide an anti-glare shield on the display, device, or board to decrease glare. • Provide anti-glare acetate (colored plastic filter) overlay on visual material.
Lighting (Light sensitivity/ photophobia)	Some eye conditions result in photophobia or light sensitivity.	• Does the student's eye condition result in photophobia or light sensitivity? • Does the student's visual performance improve in lower levels of light? • Does the student exhibit excessive squinting, blinking, or try to shield eyes under various lighting conditions? • Does the student exhibit a change in behavior when moving from dark to light or light to dark environments?	• Use rheostats to control amount of direct light. • Use sunlenses that absorb the kind of light that con-tributes to photophobia. • Use color filters or different color light bulbs for comfort. • Use hats with brims or visors to block light.

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Contrast (Light/Dark Density – Boldness)	• Bolding materials may increase attention, localization, and discrimination. • Enlarged materials alone are not always better.	• Does the student's accuracy, endurance, working distance, and speed increase when materials are bolded? • Does the student have difficulty using LCD displays?	• Bold materials and displays or use backlighting on LCD displays. • Use visual accents to increase visual attention to materials.
Contrast (Polarity)	• Most text and displays use positive (black text on white background) polarity. • Some students perform better visually when materials are presented using negative (white text on black background) polarity.	Does the student's visual functioning increase when materials are presented using negative or positive polarity?	Use preferred polarity when designing displays or boards.
Contrast (Color vs. Black/White)	Many students report that black and white materials provide more contrast than color targets.	Does the student's visual functioning increase when using black and white materials vs. color materials?	• Use black and white if color causes a decrease in contrast. • If materials are already in color, use acetate color filters to enhance contrast.
Contrast (What's beyond the target?)	Contrast can be increased by controlling the background of the visual material.	Is the student able to discriminate materials when the background is cluttered or low in contrast?	• When asking a student to make choices using visual gaze, wear contrasting clothing. • Provide high contrast background on displays and boards. • Modify computer screen backgrounds.
Magnification	Enlarging materials may be accomplished in various ways.	Does the student require larger materials to increase discrimination?	• Make materials larger. • Allow student to move closer to materials. • Use optical low vision devices.
Distance From Materials (Working Distance)	Some students may prefer a certain working distance.	• Does the student exhibit increased visual functioning at a certain working distance? • Does the student exhibit problems with visual focusing and refocusing on materials at different distances?	• Help student control the environment by positioning materials at preferred working distance. • Decrease the demand for visual focusing and refocusing by positioning multiple working materials at the same working distance.

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Position of Materials (Angle of View)	Placement of visual materials, devices, keyboards, or language boards in various planes may increase visual performance.	• Does the student exhibit difficulty seeing desired materials when they are placed flat on a table or tray? • Does the student prefer to use a particular field of vision? • Does the student exhibit eccentric viewing (viewing materials by looking off to one side or another)?	• Use a slant board to position materials in the same plane as the student's face. • Position visual materials in student's preferred visual field.
Number of Materials Choices	Complex AAC displays may require the student to access many materials or targets.	Does the student exhibit systematic scanning and localization skills sufficient to visually access displays with many materials or targets?	• Color code materials to help the student efficiently localize and scan. • Use typoscopes (black Mylar window cutouts) to help with localization and scanning. • Promote systematic scanning on complex displays.
Spacing (Visual Clutter)	Complex AAC displays may appear to be visually cluttered.	Is the student able to discriminate between materials when they are placed in close proximity to each other?	• Use bold lines of demarcation between materials. • Block materials with bold outlines.
Font Characteristics	Different font characteristics may effect visual performance.	• Is there a particular font which the student is better able to discriminate? • Are serifs an issue?	When possible, use the student's preferred font characteristics on displays and output screens (in many cases, block style print is preferred).
Time/Speed Requirements	Communication often needs to be spontaneous and quick, requiring advanced visual skills.	Is the student able to effectively keep up with communication demands?	• Plan for needed communication messages. • Use a system that allows for maximum visual performance. • Allow for extra time.
Endurance/ Fatigue	Visual fatigue may occur when the demands on the visual system are greater than a student's tolerance.	• Does the student's level of visual performance decrease after approximately 20 minutes? • What is the student's tolerance level?	• Plan for visual rests during the day. • Allow for tactual or auditory channels to be used if appropriate. • Allow for use of no-tech and low-tech systems.