

## Specific Eye Conditions, Corresponding Impact on Vision, and Related Educational Consideration

Eye Condition	Effects on Vision	Education Considerations
<p><b>Achromatopsia</b> (color deficiency, colorblindness, achromacy, or rod achromacy)</p> <p>Cone malformation, macular deficiency, and partial or total absence of cones</p>	<ul style="list-style-type: none"> <li>• Limited or no color vision</li> <li>• Colors may be seen as shades of gray</li> <li>• Loss of detail</li> <li>• Decreased acuity</li> <li>• Central field scotomas</li> <li>• Normal peripheral fields</li> <li>• Associated with nystagmus and Photophobia</li> </ul>	<ul style="list-style-type: none"> <li>• Adapted color-dependent activities</li> <li>• Alternate methods for matching clothing</li> <li>• Support of eccentric viewing</li> <li>• High contrast materials</li> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well</li> <li>• Reduced or diffused lighting</li> <li>• Supplement vision with auditory and tactile information</li> </ul>
<p><b>Albinism</b></p> <p>Total or partial absence of pigment, causing abnormal optic nerve development</p> <p>Lenses and tinted lenses may be prescribed.</p>	<ul style="list-style-type: none"> <li>• Decreased acuity</li> <li>• Photophobia</li> <li>• Increased sensitivity to glare</li> <li>• High refractive error</li> <li>• Astigmatism</li> <li>• Central scotomas</li> <li>• Nystagmus</li> <li>• Muscle imbalance</li> <li>• Eye fatigue with close or detailed work</li> <li>• Reduced depth perception</li> </ul>	<ul style="list-style-type: none"> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Close viewing</li> <li>• High contrast materials</li> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well</li> <li>• Lighting from behind</li> <li>• Reduced glare</li> <li>• Line markers and templates - placeholders</li> <li>• Frequent breaks</li> </ul>
<p><b>Amblyopia</b> (was Anopsia, called “lazy eye”)</p> <p>See <a href="#"><u>Strabismus</u></a></p>	<ul style="list-style-type: none"> <li>• Monocular vision</li> <li>• Reduced visual field</li> <li>• Reduced depth perception</li> <li>• May develop blindness in one eye</li> <li>• Reduced visual-motor abilities</li> </ul>	<ul style="list-style-type: none"> <li>• Frequent breaks</li> <li>• Seating should favor functional eye.</li> <li>• Familiarization with new environments</li> <li>• Time to adjust in new situations</li> </ul>

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<p>Reduced visual functioning in one eye, which causes the person to use one eye instead of both.</p> <p>With young children, eye exercises, occlusion or patching of one eye, or surgery may help.</p>	<ul style="list-style-type: none"> <li>• Eye fatigue with close or detailed work</li> </ul>	<ul style="list-style-type: none"> <li>• May need adaptations for activities requiring visual-motor coordination</li> </ul>
<p><b>Aniridia</b></p> <p>A rare genetic disorder that causes the absence of all or part of the iris, usually affecting both eyes.</p> <p>It also causes the cornea to lose clarity over time by inhibiting the stem cells that “refresh” it with new, clear epithelial cells. Aniridia is often associated with amblyopia, cataracts, the development of closed-angle glaucoma, and sometimes displaced lenses, under-developed retinas, and nystagmus. Contact lenses with an artificial iris, tinted spectacles, or bioptic glasses may be prescribed. Iris and stem cell implant surgeries are now possible.</p> <p>Hereditary aniridia is associated with Gillespie syndrome. Sporadic Aniridia may cause nephroblastoma (Wilms’ tumor), which is associated with WAGR syndrome.</p>	<ul style="list-style-type: none"> <li>• Decreased acuity</li> <li>• Photophobia</li> <li>• Large pupil that may be misshapen</li> <li>• Generally, respond very well to use of low vision devices</li> <li>• Corneal involvement: Scattered light, increased glare, blurred vision, and further reduction of acuity</li> <li>• If cataracts develop: further reduction of visual acuity, blurred vision, and decreased color vision</li> <li>• Fovial involvement: loss of detailed (fine) vision</li> <li>• If glaucoma develops: fluctuating visual functioning, field loss, poor night vision, and decreased sensitivity to contrast</li> </ul>	<ul style="list-style-type: none"> <li>• Vision stimulation for infants to maximally develop the visual cortex</li> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well</li> <li>• Allow time for adjustment to lighting changes</li> <li>• Provide seating in the front of the classroom with back to windows</li> <li>• Reduced glare</li> <li>• Provide lighting from behind</li> <li>• Reduced or diffused lighting</li> <li>• Lamps with rheostats and adjustable arms</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Use of a black chalkboard and bold chalk</li> <li>• If white board is used, bold black markers are recommended over other colors</li> <li>• Felt-tipped pens and tinted paper with bold lines</li> <li>• Place paper or worksheets on a dark or black background (e.g., blotter, construction or butcher paper, posterboard, etc.)</li> </ul>

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		<ul style="list-style-type: none"> <li>• Provide copies of materials presented on the board.</li> <li>• Use black backgrounds and white sans serif fonts in slide presentations</li> </ul>
<p><b>Anophthalmia</b></p> <p>Absence of one or both eyeballs</p> <p>Causes can be heredity, injury, or secondary to disease. Prosthetic eyes are prescribed to preserve the health of the eyelids and surrounding tissues.</p>	<ul style="list-style-type: none"> <li>• Monocular vision: <ul style="list-style-type: none"> <li>○ Reduced fields</li> <li>○ Reduced depth perception</li> <li>○ Blindness</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• May need visual efficiency training to develop scanning skills</li> <li>• Seating and presentation of materials should favor functional eye</li> <li>• May need tactile and auditory learning media</li> </ul>
<p><b>Aphakia</b></p> <p>Absence of the lens</p> <p>Although it can be caused by injury, aphakia is usually a result of cataract surgery. Treatments include lens implants, contact lenses, and/or glasses.</p>	<ul style="list-style-type: none"> <li>• Inability to accommodate to varying focal distance</li> <li>• Inability to accommodate to lighting changes</li> <li>• Reduced depth perception</li> <li>• May have peripheral field distortions</li> </ul>	<ul style="list-style-type: none"> <li>• Support wearing of any prescribed lenses</li> <li>• High contrast materials</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Enlarged printed materials</li> <li>• Close viewing</li> <li>• Adequate lighting (e.g., lights with rheostats and adjustable arms)</li> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well</li> <li>• Allow time for adjustment to lighting changes</li> </ul>
<p><b>Astigmatism</b></p> <p>Irregularity in the curvature of the cornea and/or lens, which prevents light rays from being properly focused on a single point on the retina</p>	<ul style="list-style-type: none"> <li>• Blurred vision at any distance (uncorrected)</li> <li>• Distorted vision</li> <li>• Tendency to squint to create a pinhole effect</li> </ul>	<ul style="list-style-type: none"> <li>• High contrast materials</li> <li>• Adequate lighting (e.g., lamps with rheostats and adjustable arms)</li> <li>• Frequent breaks from close and detailed work</li> </ul>

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<p>Astigmatism commonly occurs with myopia and hyperopia. It also can be associated with albinism and keratoconus. Corrective lenses may be prescribed.</p>	<ul style="list-style-type: none"> <li>• Visual fatigue associated with close work</li> </ul>	
<p><b>Buphthalmos</b> (Infantile glaucoma)</p> <p>Enlarged eyeballs</p> <p>Caused by congenital glaucoma; hereditary; onset from birth to three years; can cause enlargement and increased depth of the anterior chamber, damage to the optic disc, and/or increased diameter and thinning of the cornea; requires surgery, and blindness occurs if left untreated.</p>	<ul style="list-style-type: none"> <li>• Photophobia</li> <li>• Reduced central acuity</li> <li>• Corneal opacity</li> <li>• Excessive tearing</li> <li>• Refractive error</li> <li>• Eye pain</li> </ul>	<ul style="list-style-type: none"> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well</li> <li>• Reduced or diffused lighting from behind</li> <li>• Sunglasses, visors or hats may be worn indoors</li> <li>• Allow time for adjustment to lighting changes</li> <li>• High contrast materials</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Enlarged printed materials</li> <li>• Close viewing</li> </ul>
<p><b>Cataracts</b></p> <p>Opacity or cloudiness of the lens, which restricts passage of light to the retina; usually bilateral</p> <p>Opacity increases over time until “mature” cataracts can obscure the fundus and the pupil may appear white. Mature cataracts are usually removed surgically, requiring lens implants or contact lenses.</p>	<ul style="list-style-type: none"> <li>• Reduced visual acuity</li> <li>• Blurred vision</li> <li>• Reduced color discrimination</li> <li>• Photophobia</li> <li>• Associated with nystagmus</li> <li>• Visual ability fluctuates according to light</li> <li>• If cataracts are centrally located, near vision will be reduced</li> <li>• Increased sensitivity to glare</li> </ul>	<ul style="list-style-type: none"> <li>• Support of the wearing of any prescribed lenses</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Enlarged printed materials</li> <li>• Close viewing</li> <li>• Support of eccentric viewing</li> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well</li> <li>• May need reduced or diffused lighting</li> <li>• Lighting from behind</li> <li>• May need lamps with rheostats and adjustable arms</li> </ul>

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<p><b>Chorioretinitis</b></p> <p>Posterior uveitis, or an inflammation of the choroid that spreads to the retina</p> <p>This can be caused by tuberculosis, histoplasmosis, or toxoplasmosis.</p>	<ul style="list-style-type: none"> <li>• Blurred vision</li> <li>• Photophobia</li> <li>• Distorted images</li> <li>• Central scotomas</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced glare</li> <li>• Support of eccentric viewing</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Enlarged printed materials</li> <li>• Close viewing</li> <li>• Diffused, less intense light to enlarge the pupil</li> <li>• Telescope</li> <li>• May need to use tinted lenses, sunglasses, visors, or hats outdoors and indoors as well</li> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> </ul>
<p><b>Coats' Disease</b> (Exudative Retinitis or retinitis telangiectasia)</p> <p>A congenital, nonhereditary, and progressive disorder that is characterized by abnormal development of the blood vessels behind the retina</p> <p>Coats' occurs mainly in males. Symptoms typically appear in children around six to eight years old but can appear in infancy. Coats' usually affects only one eye. Severity depends on the size and number of affected blood vessels. Leakage of blood and fluids causes retinal swelling and detachment. Cryotherapy and laser photo-</p>	<ul style="list-style-type: none"> <li>• Decreased central acuity</li> <li>• Loss of detail</li> <li>• Progressive central field loss</li> <li>• Reduced night vision</li> <li>• Loss of color vision</li> <li>• May develop strabismus</li> <li>• May have iritis</li> <li>• May have glaucoma</li> <li>• May develop cataracts</li> <li>• May be blind in one eye</li> <li>• Peripheral fields can be affected</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid contact sports and other high-risk activities to prevent retinal detachment</li> <li>• Seating and presentation of work should favor more functional eye</li> <li>• Visual efficiency training to develop scanning skills</li> </ul>

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<p>coagulation sometimes are used to stop the progression of blood vessel growth and leakage.</p>		
<p><b>Coloboma</b></p> <p>A hereditary congenital disability that causes a notch or cleft in the pupil, iris, ciliary body, lens, retina, choroid, or optic nerve.</p> <p>A “Keyhole” pupil often occurs. It can be associated with refractive error, cataracts, nystagmus, strabismus, and glaucoma (later in life).</p>	<ul style="list-style-type: none"> <li>• Decreased acuity</li> <li>• Photophobia</li> <li>• Muscle imbalance</li> <li>• Restricted fields (if retina is affected)</li> <li>• Reduced depth perception</li> </ul>	<ul style="list-style-type: none"> <li>• High contrast materials</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Average to bright light</li> <li>• Reduced glare</li> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well (if iris is affected)</li> <li>• High contrast line markers and templates may be helpful for reading, finding math problems, or locating other information</li> </ul>
<p><b>Color deficiency</b> (colorblindness)</p> <p>See <a href="#">Achromatopsia</a></p>		
<p><b>Cone Monochromacy</b></p> <p>See <a href="#">Achromatopsia</a></p>		
<p><b>Corneal Ulcers, Corneal Opacities, Corneal Scarring, Keratitis, and Interstitial Keratitis</b></p> <p>An open sore or scarring on any part of the cornea</p> <p>It can be caused by bacteria, viruses (herpes), fungi, vitamin deficiency, injury, a hypersensitive reaction, diabetes, or severe dry eye. Superficial ulcers (called abrasions)</p>	<ul style="list-style-type: none"> <li>• Photophobia</li> <li>• Fracturing of light (like looking through broken glass)</li> <li>• Increased glare</li> <li>• Blurred vision</li> <li>• Reduced acuity</li> <li>• Blindness</li> </ul>	<ul style="list-style-type: none"> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well</li> <li>• Reduced or diffused lighting</li> <li>• Sunglasses, visors or hats may be worn indoors</li> <li>• Seating in front of room with back toward windows</li> <li>• Reduced glare</li> <li>• High contrast materials</li> <li>• Diffused lighting from behind</li> </ul>

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<p>usually heal quickly and completely, but deep ulcers cause growth of scar tissue or new blood vessels that impair vision. Corneal ulcers are usually quite painful, and other symptoms may include vision loss, squinting, and tearing (watering). Early diagnosis and treatment are crucial. With extensive scarring, a corneal transplant may be necessary. There are promising results with use of artificial corneas, which seem to be less likely to be rejected.</p>		<ul style="list-style-type: none"> <li>• Lights with rheostats and adjustable arms are helpful for close work.</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Enlarged printed materials</li> <li>• Frequent breaks from visual tasks</li> <li>• Support of eccentric viewing</li> <li>• May need auditory materials for longer reading assignments</li> </ul>
<p><b>Cortical Visual Impairment (CVI)</b></p> <p>A visual neurological disorder resulting from damage to the optic nerve and/or parts of the brain that process and interpret visual information (i.e., visual cortex)</p> <p>CVI is characterized by:</p> <ul style="list-style-type: none"> <li>• Specific color preference, especially for red and yellow</li> <li>• Attraction to movement</li> <li>• Visual field preference, especially for peripheral fields</li> <li>• Visual latency: delayed visual processing - in directing gaze, identification, recognition, and/or discrimination</li> </ul>	<ul style="list-style-type: none"> <li>• Fluctuation in visual functioning</li> <li>• Reduced visual fields</li> <li>• Photophobia</li> <li>• Fatigue has a negative impact on visual performance</li> </ul>	<ul style="list-style-type: none"> <li>• Use of movement to increase visual attention</li> <li>• Use of preferred color to increase visual attention</li> <li>• Present visual information in preferred visual field</li> <li>• Present visual information on a solid background (e.g., black or white cloth)</li> <li>• Use of bright, high contrast materials</li> <li>• Increase line spacing and white space on a page of text and/or images to reduce visual clutter and complexity</li> <li>• Use high contrast templates to reduce the amount of information seen at one time</li> <li>• Close viewing</li> <li>• Vision efficiency training</li> <li>• Frequent breaks from visual tasks</li> <li>• High illumination from behind</li> <li>• Sunglasses, visors or hats may be worn indoors</li> <li>• Support use of one sense at a time</li> </ul>

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<ul style="list-style-type: none"> <li>• Difficulties with discrimination and interpretation of complex visual information</li> <li>• Poor visual attention</li> <li>• Atypical visual responses (e.g., looking at something while appearing not to look)</li> <li>• May not look at an object and reach for it simultaneously (look first, then look away while reaching)</li> <li>• Better visual performance with familiar objects or settings</li> <li>• Unique visual features (i.e., light gazing and non-purposeful gaze)</li> </ul>		<ul style="list-style-type: none"> <li>• Reduce visual, auditory, and tactile distractions</li> <li>• Extra time to respond</li> <li>• Extra time to adjust to new environments</li> <li>• Use of consistent language</li> <li>• Use of color coding as visual cues for recognition</li> <li>• Use of consistent visual cues across settings</li> </ul>
<p><b>Diabetic Retinopathy</b></p> <p>Changes in the blood vessels of the retina, causing hemorrhaging in the retina and vitreous</p> <p>It is caused by juvenile or type 2 diabetes. It may lead to retinal detachment and blindness.</p>	<ul style="list-style-type: none"> <li>• Increased sensitivity to glare</li> <li>• Lack of accommodation</li> <li>• Floating obstructions in the vitreous</li> <li>• Fluctuating acuity</li> <li>• Diminished color vision</li> <li>• Reduced visual fields</li> <li>• Double vision</li> <li>• Blindness</li> </ul>	<ul style="list-style-type: none"> <li>• Adequate high-quality lighting (e.g., lamps with rheostats and adjustable arms)</li> <li>• High contrast materials</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Large button or key technology may be helpful</li> <li>• Training in use of auditory materials may be needed due to loss of vision and tactile sensitivity</li> <li>• Training in use of speech recognition input software may be helpful</li> <li>• Precautions related to decreased sensitivity in hands and feet (e.g., burns, cuts, falls)</li> </ul>
<p><b>Diplopia</b></p>	<ul style="list-style-type: none"> <li>• Visual confusion</li> <li>• Double vision</li> </ul>	<ul style="list-style-type: none"> <li>• High contrast materials</li> <li>• Reduced glare</li> </ul>



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<p>Muscular defect that restricts the ability of the eyes to work together</p> <p>It causes double vision, as the image from one eye is imposed on the image from the other eye. Left untreated, this condition can develop into amblyopia. Corrective lenses may be prescribed.</p>	<ul style="list-style-type: none"> <li>• Dizziness</li> <li>• Suppression of the image from one eye, causing monocular vision</li> <li>• Eye fatigue</li> <li>• Blurring of print</li> <li>• Headache</li> <li>• Loss of place in visual tasks</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time to adjust to new situations</li> <li>• Frequent breaks from visual tasks</li> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> <li>• Familiarization with new environments</li> </ul>
<p><b>Dislocated Lens</b></p> <p>The lens is not in its natural position.</p> <p>It is sometimes associated with coloboma, Marfan’s syndrome, or Marchesani’s syndrome. Also, it may be associated with diplopia or cataracts.</p>	<ul style="list-style-type: none"> <li>• Blurred vision</li> <li>• Double Vision</li> <li>• Visual fatigue during close or detailed visual tasks</li> </ul>	<ul style="list-style-type: none"> <li>• Frequent breaks from visual tasks</li> <li>• High contrast materials</li> <li>• Adequate lighting (e.g., lamps with rheostats and adjustable arms)</li> <li>• Reduced or diffused lighting</li> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> </ul>
<p><b>Enucleation</b></p> <p>The anterior chamber or the entire eyeball is surgically removed from the orbit (eye socket).</p> <p>Prosthetic eyes or scleral shells are usually recommended.</p>	<ul style="list-style-type: none"> <li>• If one eye is removed, there is no depth perception.</li> <li>• Monocular vision</li> <li>• Reduced visual field</li> <li>• Effects of any eye condition(s) of the remaining eye</li> <li>• Blindness</li> <li>• Effects visual-motor skills, especially reach and negotiation of steps and drop-offs</li> </ul>	<ul style="list-style-type: none"> <li>• Training in care of prostheses</li> <li>• Vision efficiency training (i.e., scanning)</li> <li>• Considerations related to the visual impairment of the remaining eye</li> <li>• Considerations related to possible changes in learning media</li> </ul>
<p><b>Esophoria, Esotropia, Exophoria, and Exotropia</b></p> <p>See <a href="#">Strabismus</a></p>		

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<p><b>Glaucoma</b></p> <p>An eye disease which causes increased pressure in the eye because of blockage in the normal flow of the fluid in the aqueous humor</p> <p>Causes include changes in the lens or uveal tract, trauma, reaction to a medication, surgical procedures, and heredity. Eye pain and headaches are associated with glaucoma. Prescription eye drops to reduce pressure must be used regularly, and surgery may be necessary. Untreated, glaucoma can lead to degeneration of the optic disk and blindness.</p>	<ul style="list-style-type: none"> <li>• Fluctuating visual functioning</li> <li>• Field loss</li> <li>• Poor night vision</li> <li>• Photophobia</li> <li>• Difficulty reading</li> <li>• Difficulty seeing large objects presented at close range</li> <li>• Decreased sensitivity to contrast</li> <li>• Eye redness</li> <li>• Hazy cornea</li> <li>• Wide open pupil</li> <li>• Stress and fatigue have a negative effect on visual performance</li> </ul>	<ul style="list-style-type: none"> <li>• Support use of sunglasses, visors, or hats in bright sunlight and bright lighting indoors</li> <li>• Allow time for adjustment to lighting changes</li> <li>• Reduced glare</li> <li>• Adequate lighting (e.g., lamps with rheostats and adjustable arms)</li> <li>• High contrast materials</li> <li>• May benefit from magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• May need visual efficiency training to develop scanning skills</li> <li>• Frequent breaks from visual tasks</li> <li>• May need instruction in tactile learning and braille</li> <li>• Teachers must be alert to signs of pain and increased ocular pressure.</li> </ul>
<p><b>Hemianopia</b> (hemianopsia)</p> <p>Blindness or impaired vision in one half of the visual field in one or both eyes</p> <p>If both eyes are affected, vision loss may occur on the same side in both nasal fields, or in both temporal fields. Visual acuity in the unaffected field(s) remains unchanged. Hemianopia can be caused by stroke, other brain trauma, tumors, infection, or surgery.</p>	<ul style="list-style-type: none"> <li>• Field loss</li> <li>• May be unaware of missing visual information</li> </ul>	<ul style="list-style-type: none"> <li>• Visual efficiency training to develop scanning skills</li> <li>• Use markers at the beginning and/or ending of each line of text to facilitate reading the entire line</li> </ul>
<p><b>Histoplasmosis</b> (Presumed Histoplasmosis Syndrome - POHS)</p>	<ul style="list-style-type: none"> <li>• Distorted vision</li> <li>• Blind spots</li> </ul>	<ul style="list-style-type: none"> <li>• Lamps with rheostats and adjustable arms</li> </ul>

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<p>This is a syndrome affecting the choroid and retina, which is characterized by peripheral atrophic chorioretinal scars, maculopathy, and atrophy or scarring adjacent to the optic disc. Vision loss is secondary to macular and choroidal neovascularization (CNV).</p> <p>POHS is most likely caused by a fungal infection acquired through exposure to spores in bird droppings and bat guano. Treatments include steroids to treat the initial infection, laser, anti-vascular endothelial growth factors, and photodynamic therapy. Prism lenses may be prescribed.</p>	<ul style="list-style-type: none"> <li>• Macular damage or central scotomas cause “patchy” fields, central vision loss, and reduced color vision.</li> <li>• Peripheral damage causes loss of night vision</li> </ul>	<ul style="list-style-type: none"> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information.</li> </ul> <p><i>Central damage:</i></p> <ul style="list-style-type: none"> <li>• Eccentric viewing</li> <li>• Magnification to enlarge an image beyond the scotoma</li> <li>• Enlarged printed materials</li> <li>• Close viewing</li> <li>• Adapted color-dependent activities</li> <li>• Alternate methods for matching clothing</li> <li>• Diffused, less intense light to enlarge the pupil so that more area can be viewed</li> <li>• CCTV with reversible foreground and background (white on black)</li> </ul> <p><i>Peripheral damage:</i></p> <ul style="list-style-type: none"> <li>• High illumination</li> <li>• NOIR lenses or overlay filters may be helpful</li> <li>• CCTV for maximum contrast</li> <li>• Night vision devices (e.g., Streamlight flashlights, Third Generation® Night Vision Devices, etc.)</li> <li>• Visual efficiency training in organized search (grid) patterns</li> <li>• May need to be seated farther away from the front to see more of the viewing area (e.g., board, screen, chart, etc.)</li> </ul>

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<p><b>Hyperopia</b> (Farsightedness)</p> <p>A refractive error in which the focal point for light rays is behind the retina</p> <p>It is caused by the eyeball being too short from front to back. Corrective lenses are usually prescribed.</p>	<ul style="list-style-type: none"> <li>• Distance acuity is better than near acuity</li> <li>• Uncorrected, close visual tasks may cause headache, nausea, dizziness, and eye rubbing</li> </ul>	<ul style="list-style-type: none"> <li>• Support use of prescription lenses for close visual tasks</li> <li>• Magnification for near tasks (e.g., hand-held magnifier, electronic magnifier, screen enlargement software)</li> <li>• Frequent breaks from close visual tasks</li> <li>• Alternate near and distance visual tasks</li> </ul>
<p><b>Hyperphoria, Hypertropia, Hypophoria, Hypotropia</b></p> <p>See <a href="#">Strabismus</a></p>		
<p><b>Hypoplasia</b></p> <p>See <a href="#">Optic Atrophy</a></p>		
<p><b>Keratitis</b></p> <p>See <a href="#">Corneal Ulcer</a></p>		
<p><b>Keratoconus (KC)</b></p> <p>Degenerative disorder in which the cornea thins and takes on a conical shape</p> <p>Keratoconus is often bilateral but not symmetrical, so vision may be significantly better in one eye than the other. Vision deteriorates at varying rates (sometimes quite rapidly), and plateaus of stable vision can occur. Although it seems to be hereditary, keratoconus is typically</p>	<ul style="list-style-type: none"> <li>• Slightly blurred vision in early stages, increasing as KC progresses</li> <li>• Distortion of entire visual field, which worsens in low light</li> <li>• Decreased visual acuity especially distance vision</li> <li>• Irregular astigmatism (parts of the field are in focus, and parts are out of focus)</li> <li>• Increased sensitivity to glare</li> <li>• Decreased night vision</li> <li>• Multiple images</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid activities that could cause corneal damage, such as contact sports and swimming in heavily chlorinated water</li> <li>• Reduced glare</li> <li>• Diffused lighting</li> <li>• Lamps with rheostats and adjustable arms</li> <li>• High contrast materials</li> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>diagnosed in adolescence. It is sometimes associated with retinitis pigmentosa, Down's syndrome, Marfan's syndrome, and aniridia. Treatments include prescription lenses and various surgeries: intrastromal corneal ring segments, cross-linking, mini asymmetrical radial keratotomy, and corneal transplants. There are promising results in transplants with use of artificial corneas, which seem to be less likely to be rejected.</p>	<ul style="list-style-type: none"> <li>• Flaring of images</li> <li>• Streaking</li> <li>• Stationary objects and lights may appear to move</li> <li>• May develop photophobia</li> <li>• Cornea can rupture</li> <li>• Can lead to blindness</li> </ul>	<ul style="list-style-type: none"> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> </ul>
<p><b>Leber Congenital Amaurosis (LCA, Leber Congenital Amaurosis)</b></p> <p>A rare hereditary disorder that leads to degeneration of the macula</p> <p>LCA becomes evident within the first few months of life. Progressive central field loss can occur, although vision is generally stable. LCA is a subset of retinitis pigmentosa with at least thirteen described types that are distinguished by genetic cause, patterns of vision loss, and associated eye conditions. Nystagmus, keratoconus, photophobia, extreme hyperopia, and sluggish (or absent) pupillary response to light are often present with LCA. Excessive rubbing of eyes (also poking or pressing) is a characteristic behavior.</p>	<ul style="list-style-type: none"> <li>• Decreased acuity</li> <li>• Reduced night vision</li> <li>• Progressive central field loss</li> <li>• Loss of color vision</li> <li>• Loss of detail</li> <li>• Peripheral fields can be affected</li> </ul>	<ul style="list-style-type: none"> <li>• May need visual efficiency training to develop scanning skills</li> <li>• Support of eccentric viewing</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• High contrast materials</li> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> <li>• Enlarged printed materials</li> <li>• Close viewing</li> <li>• Adapted color-dependent activities</li> <li>• Alternate methods for matching clothing</li> <li>• Lamps with rheostats and adjustable arms</li> <li>• Support use of sunglasses, visors, or hats in bright sunlight</li> <li>• Seat in the front of the room with windows behind back</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
		<ul style="list-style-type: none"> <li>• May need frequent breaks from visual tasks</li> <li>• May need instruction in use of auditory materials</li> <li>• May need instruction in tactile learning and braille</li> </ul>
<p><b>Leber Hereditary Optic Neuropathy (LHON, Leber Optic Atrophy)</b></p> <p>It is a rare hereditary disease caused by a mitochondrial mutation and passed on by the mother. It is characterized by rapidly progressive and severe optic nerve degeneration (atrophy).</p> <p>It occurs in young men and, rarely, young women. Onset is usually in young adulthood. Most often, there is acute vision loss in one eye and then, a few weeks or months later, in the other eye, but vision loss sometimes occurs in both eyes simultaneously. It can include other types of central nervous system involvement.</p>	<ul style="list-style-type: none"> <li>• Reduced central acuity</li> <li>• Vision may be blurred</li> <li>• Fluctuating visual performance</li> <li>• Color vision may be impaired</li> <li>• Visual perception may be impaired</li> </ul>	<ul style="list-style-type: none"> <li>• High illumination</li> <li>• High contrast</li> <li>• Enlarged printed materials</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Avoid visual clutter:</li> <li>• Present visual information in isolation</li> <li>• Avoid busy backgrounds</li> <li>• Avoid wearing patterned clothing when presenting visual information</li> </ul>
<p><b>Macular Degeneration</b> (Macular Disease, Congenital Macular Disease, and Age-Related Macular Degeneration)</p> <p>Progressive (degenerating) damage to the central part of the retinal cones</p>	<ul style="list-style-type: none"> <li>• Reduced central acuity</li> <li>• Peripheral vision is not affected</li> <li>• Central scotomas</li> <li>• Distorted vision</li> <li>• Blurred vision</li> <li>• Decreased color vision</li> <li>• Slow recovery from changes in light</li> <li>• Loss of contrast sensitivity</li> </ul>	<ul style="list-style-type: none"> <li>• Support of eccentric viewing</li> <li>• Support use of sunglasses, hats, or visors in bright sunlight</li> <li>• Allow time for adjustment to lighting changes</li> <li>• Adequate lighting (e.g., lamps with rheostats and adjustable arms)</li> <li>• Diffused lighting may allow the pupil to enlarge so that more area can be viewed</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>The dry form involves yellow deposits (cellular debris) on the macula and eventually, thinning of cells in the macula, which leads to tissue death. In the wet form, there is abnormal growth of blood vessels in the choroid underneath the macula. These blood vessels leak blood and fluid into the retina, causing distortion, blind spots, loss of central vision, retinal scarring, and risk of retinal detachment. Macular degeneration is the leading cause of blindness in people over 60, but it also can occur in children below age seven. Factors contributing to the development of the disease include heredity, diabetes, head injury, nutritional deficits, high cholesterol, smoking, and exposure to sunlight without eye protection. There is no cure, but treatment can slow progress of the disease. Treatments include nutritional supplements, laser therapy, and medication.</p>	<ul style="list-style-type: none"> <li>• Visual fatigue</li> </ul>	<ul style="list-style-type: none"> <li>• Close viewing</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier with light text on dark background, screen enlargement software, telescope for distance viewing etc.)</li> <li>• Reduced glare</li> <li>• High contrast materials</li> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> <li>• Seating in front with back to window</li> <li>• Adapted color-dependent activities</li> <li>• Alternate methods for matching clothing</li> <li>• Frequent breaks from visual tasks</li> <li>• Avoid standing in front of a light source when speaking to the student</li> </ul>
<p><b>Microphthalmia</b> (Microphthalmos, nanophthalmia, nanophthalmos)</p> <p>A hereditary, developmental disorder that causes one or both eyes to be abnormally small</p>	<ul style="list-style-type: none"> <li>• Decreased visual acuity</li> <li>• Photophobia</li> <li>• May have fluctuating visual abilities</li> </ul>	<ul style="list-style-type: none"> <li>• High contrast</li> <li>• Reduced glare</li> <li>• Average to bright light</li> <li>• May need magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>It may occur with other congenital abnormalities such as club foot, additional fingers or toes, webbed digits, polycystic kidneys, and cystic liver. This disorder can be associated with Patau Syndrome, Triploid Syndrome, or Wolf-Hirschhorn Syndrome. It may result in cataracts, glaucoma, aniridia, and coloboma.</p>		<ul style="list-style-type: none"> <li>• Expectations may need to be adjusted due to the frustration related to fluctuating visual abilities</li> <li>• Frequent breaks from visual tasks</li> <li>• Instruction in strategies for stress reduction and dealing with frustration related to fluctuating visual abilities</li> </ul>
<p><b>Muscle Imbalance</b></p> <p>See <a href="#">Strabismus</a> and <a href="#">Amblyopia</a></p>		
<p><b>Myopia</b> (Simple and Degenerative Myopia, nearsightedness)</p> <p>A refractive error in which the image of a distant object is formed in front of the retina and cannot be seen distinctly; eyeball is elongated from front to back</p> <p>Degenerative myopia is progressive, causing increasingly severe nearsightedness, so that visual acuity often cannot be corrected to normal with lenses. It can lead to retinal detachment, choroidal hemorrhages, reduced central vision, opacities in the vitreous, macular swelling, and cataracts. Treatments include corrective lenses and LASIC surgery.</p>	<ul style="list-style-type: none"> <li>• Reduced distance acuity</li> <li>• Near vision is better than distance vision</li> <li>• May squint and frown when trying to see at a distance</li> </ul>	<ul style="list-style-type: none"> <li>• High illumination</li> <li>• Reduced glare</li> <li>• May need to be seated closer to the front in order to see written information, videos, and demonstrations</li> <li>• If myopia is progressive, take precautions to protect the retina</li> </ul>
<p><b>Nystagmus</b></p>	<ul style="list-style-type: none"> <li>• Inability to maintain steady fixation</li> <li>• Reduced visual acuity</li> </ul>	<ul style="list-style-type: none"> <li>• Shifting gaze or tilting the head may help to find the null point at which the nystagmus slows.</li> </ul>



Eye Condition	Effects on Vision	Education Considerations
<p>Involuntary eye movements, which can be horizontal, vertical, circular, or mixed</p> <p>Causes can be heredity, neurological disorders, toxicity, pharmaceutical drugs, alcohol, inner ear disturbance, or unknown. Nystagmus can be increased by stress, spinning, and rhythmic movements.</p>	<ul style="list-style-type: none"> <li>• Visual fatigue</li> <li>• Vertigo (rare)</li> <li>• Stripes and other patterns may increase the rate of the nystagmus</li> </ul>	<ul style="list-style-type: none"> <li>• Frequent breaks from close visual tasks</li> <li>• Vary visual tasks</li> <li>• Adequate lighting</li> <li>• Good contrast</li> <li>• Line markers, rulers, typoscopes, and other templates may be helpful for keeping the place on a page</li> <li>• Instruction in stress reduction strategies</li> </ul>
<p><b>Optic Atrophy (Optic Nerve Atrophy)</b></p> <p>Hereditary or acquired damage to the optic nerve that limits or stops transmission of visual information from the eye to the brain</p> <p>It is evidenced by a pale optic disc and reduced pupillary response. Acquired optic atrophy can be caused by disease, pressure on the optic nerve, trauma, glaucoma, or toxicity. Type 1 optic atrophy is progressive.</p>	<ul style="list-style-type: none"> <li>• Fluctuating visual performance</li> <li>• Color vision may be reduced</li> <li>• Night vision may be reduced</li> <li>• Visual perception may be impaired</li> <li>• May have photophobia</li> </ul>	<ul style="list-style-type: none"> <li>• Visual stimulation in infancy and early childhood.</li> <li>• Low vision training in early childhood to help the child interpret visual information</li> <li>• Supplement visual information with tactile and auditory information</li> <li>• High illumination</li> <li>• If photophobia is present: <ul style="list-style-type: none"> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well</li> </ul> </li> <li>• Provide adequate lighting through use of lamps with rheostats and adjustable arms)</li> <li>• High contrast</li> <li>• Enlarged print</li> <li>• May need magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Avoid visual clutter: <ul style="list-style-type: none"> <li>• Present visual information in isolation</li> </ul> </li> <li>• Avoid busy backgrounds</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
		<ul style="list-style-type: none"> <li>• Avoid wearing patterned clothing when presenting visual information</li> <li>• May need adapted color dependent activities</li> <li>• May need alternate methods for matching clothing</li> <li>• May need instruction in tactile learning and braille</li> </ul>
<p><b>Optic Nerve Hypoplasia (ONH)</b></p> <p>ONH and Septo-Optic Dysplasia (SOD) are related disorders of early brain development. ONH is a congenital, nonprogressive condition in which the optic nerve is under-developed and small.</p> <p>It may affect one or both eyes, and when both are affected, side-to-side nystagmus is frequently present. During the first few years of life, vision may improve as the brain continues to develop. The incidence of strabismus is increased with ONH. It is one of the three defining characteristics of Septo-Optic Dysplasia, which is also called DeMorsier’s Syndrome. Learning disability, autism, cerebral palsy, and intellectual developmental delays can occur with ONH and SOD. Possible causes include young maternal age, genetic mutation, fetal alcohol syndrome, trauma, and viral infection.</p>	<ul style="list-style-type: none"> <li>• May have decreased visual acuity</li> <li>• May have better acuity in one eye than in the other</li> <li>• May have nystagmus</li> <li>• May have strabismus</li> <li>• May have variable field restrictions</li> <li>• Visual perception may be impaired</li> </ul>	<ul style="list-style-type: none"> <li>• High illumination</li> <li>• High contrast</li> <li>• Enlarged printed materials</li> <li>• May need magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Avoid visual clutter:</li> <li>• Present visual information in isolation</li> <li>• Avoid busy backgrounds</li> <li>• Avoid wearing patterned clothing when presenting visual information</li> <li>• Provide opportunities to confirm or clarify visual information through tactile exploration</li> <li>• May benefit from verbal descriptions to help make sense of visual information.</li> <li>• May need adapted color dependent activities</li> <li>• May need alternate methods for matching clothing</li> <li>• May need instruction in tactile learning and braille</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p><b>Peter's Anomaly</b></p> <p>A congenital, genetic disorder that involves clouding (opacity) and thinning of the cornea</p> <p>It is caused by abnormal development of the front third of the eye (anterior segment), and central opacities are most common. The iris may or may not be attached to the cornea (Type 1), and cataracts and other lens abnormalities may be present (Type 2). It is very common for amblyopia and glaucoma to develop. This condition can be associated with peters plus syndrome.</p>	<ul style="list-style-type: none"> <li>• Blurred vision</li> <li>• Decreased central acuity</li> <li>• May have scotomas in peripheral fields</li> <li>• Photophobia</li> <li>• Increased sensitivity to glare</li> <li>• Reduced color discrimination</li> <li>• Visual ability fluctuates according to lighting</li> <li>• May have reduced near vision</li> </ul>	<ul style="list-style-type: none"> <li>• Support of eccentric viewing</li> <li>• May need visual efficiency training to develop scanning skills</li> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well</li> <li>• Adequate lighting from behind using lamps with rheostats and adjustable arms</li> <li>• Reduced glare</li> <li>• Seat with back to windows</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Enlarged printed materials</li> <li>• High contrast materials</li> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> <li>• Close viewing</li> <li>• May need adapted color-dependent activities</li> <li>• May need alternate methods for matching clothing</li> <li>• Frequent breaks from visual tasks</li> </ul>
<p><b>Photophobia</b></p> <p>Abnormal sensitivity to light (any type)</p> <p>It is usually associated with an eye disease or disorder (e.g., iritis, ocular albinism, aphakia, aniridia, dislocated lens, cataracts, glaucoma, etc.). However, many people</p>	<ul style="list-style-type: none"> <li>• Squinting</li> <li>• Closing the eyes</li> <li>• Eye pain</li> <li>• Headaches</li> <li>• Eye fatigue</li> </ul>	<ul style="list-style-type: none"> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well</li> <li>• Reduced or diffused lighting</li> <li>• Provide lighting from behind</li> <li>• Use of shielded lamps with rheostats and adjustable arms)</li> <li>• Reduced glare</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>experience mild photophobia that is unrelated to another eye condition. Other causes include corneal inflammation, some medications, and eye injuries. Severe photophobia can be quite painful, even in relatively dim light.</p>		<ul style="list-style-type: none"> <li>• May benefit from use of NOIR sunglasses and/or filters (colored overlays) when reading</li> <li>• May need breaks from visual tasks or rest periods in a darkened area</li> </ul>
<p><b>Phthisis bulbi</b></p> <p>Abnormally low intraocular pressure, which can cause shrinkage of the eye</p> <p>It may occur as a complication of eye surgery, or it can be caused by eye diseases, serious and long-term inflammation, or injury. Low pressure damages the macula. The tissues inside the eye deteriorate, become disorganized, and scar tissue is formed. In some cases, the eye can become completely nonfunctional. Sometimes a scleral shell prosthesis is prescribed for proper lid function, eyelash direction, healthy tearing, protection of the cornea, and aesthetics.</p>	<ul style="list-style-type: none"> <li>• Reduced central acuity</li> <li>• Reduced color vision</li> <li>• Blindness</li> </ul>	<ul style="list-style-type: none"> <li>• Average or bright light</li> <li>• Reduced glare</li> <li>• May need high contrast</li> <li>• May need magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• May benefit from use of high contrast line markers or templates for reading, finding math problems, or locating other information</li> <li>• May need some materials presented auditorily</li> <li>• May need instruction in tactile learning and braille</li> </ul>
<p><b>Presbyopia</b></p> <p>The gradual loss of flexibility of the lens that occurs with age</p> <p>It results in inability of the eye to focus at near distance. Presbyopia generally begins</p>	<ul style="list-style-type: none"> <li>• Blurred vision at normal reading distance</li> <li>• Headaches from doing close visual tasks</li> <li>• Further compromises the vision of aging adults who have existing visual impairments</li> </ul>	<ul style="list-style-type: none"> <li>• Adequate lighting</li> <li>• High contrast</li> <li>• Frequent breaks from near-distance visual tasks</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>to noticeably affect visual functioning around age 40, and people often need prescription lenses by age 45. Options for prescription lenses include glasses for near-distance tasks, bifocals, transition lenses, and monovision contact lenses. Vision also can be corrected by reshaping the cornea using lasers (LASIK), radio waves (conductive keratoplasty - CK), or gas bubbles (IntraCor). Other surgical treatments include artificial lens implants, corneal inlays, and corneal overlays.</p>		
<p><b>Ptosis</b></p> <p>Drooping (sagging) of the eyelid</p> <p>It may affect upper or lower lids and one or both eyes. Ptosis is usually due to weakness of the muscles that control the eyelids, damage to the nerves that control these muscles, or very loose skin of the upper eyelids. Commonly associated with the aging process, ptosis also can be congenital and hereditary, or caused by injury or disease. A ptosis crutch may be prescribed to elevate the eyelid. Medications may be prescribed for those who have myasthenias gravis. Children with severe ptosis need eyelid lift surgery early in life to insure</p>	<ul style="list-style-type: none"> <li>• Severe ptosis obscures the upper visual field</li> <li>• Long-term reduction of visual field can cause amblyopia</li> </ul>	<ul style="list-style-type: none"> <li>• May need visual efficiency training to develop scanning skills</li> <li>• Ensure access to information that is elevated (bulletin boards, black or white boards, video screens, etc.)</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>normal visual development and to prevent amblyopia.</p>		
<p><b>Retinal Detachment</b></p> <p>An emergency situation in which parts of the retina pull away from the underlying tissue that nourishes it and from the supporting structure of the eye</p> <p>Detachments can be repaired if treated within 24-72 hours, but detached parts deteriorate rapidly. Any detachment endangers the entire retina. Detachments are caused by retinal tears, fluid under it, or shrinkage of the vitreous. These conditions may be due to injury, inflammatory eye disorders, advanced diabetes, degenerative myopia, and other retinal disorders.</p>	<ul style="list-style-type: none"> <li>• Field loss</li> <li>• Blind spots (scotomas)</li> <li>• Blurred vision</li> <li>• Possible loss of central vision</li> <li>• May develop myopia and/or strabismus</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid contact sports and other high-risk physical activity to prevent retinal detachment</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• May need visual efficiency training to develop scanning skills</li> <li>• Support of eccentric viewing</li> <li>• High illumination</li> <li>• Reduced glare</li> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> <li>• Seating in front with back to window</li> <li>• Adapted color-dependent activities</li> <li>• Alternate methods for matching clothing</li> <li>• Frequent breaks from visual tasks</li> </ul>
<p><b>Retinal Dysplasia</b></p> <p>A rare, hereditary disorder resulting in abnormal development or growth of the retina and characterized by retinal folds, overgrowth of cells, and rosettes of retinal tissue</p> <p>It can be associated with Meckel syndrome.</p>	<ul style="list-style-type: none"> <li>• Field loss</li> <li>• Blind spots (scotomas)</li> <li>• Blurred vision</li> <li>• Possible loss of central vision</li> <li>• Reduced visual functioning at night or in dimly lit places</li> </ul>	<ul style="list-style-type: none"> <li>• Nighttime orientation and mobility evaluation</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Visual efficiency training to develop scanning skills</li> <li>• Support of eccentric viewing</li> <li>• Lamps with rheostats and adjustable arms</li> <li>• Reduced glare</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
		<ul style="list-style-type: none"> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> <li>• Adapted color-dependent activities</li> <li>• Alternate methods for matching clothing</li> <li>• Frequent breaks from visual tasks</li> </ul>
<p><b>Retinitis Pigmentosa (RP)</b></p> <p>A group of hereditary disorders causing degeneration of the retina</p> <p>It is characterized by progressive loss of vision and reduction of visual fields, usually from the periphery inward. However, in some cases, central vision is affected first. RP may be associated with Usher’s syndrome, Leber congenital amaurosis, Laurence-Moon Biedl, and Bassen-Kornzweig syndrome.</p>	<ul style="list-style-type: none"> <li>• Loss of peripheral vision</li> <li>• Night blindness</li> <li>• Tunnel vision</li> <li>• Decreased acuity</li> <li>• Decreased depth perception</li> <li>• Blind spots (scotomas due to retinal scarring)</li> <li>• Photophobia</li> <li>• May develop cataracts</li> <li>• May become totally blind</li> <li>• May be associated with myopia, vitreous opacities, cataracts, and keratoconus</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid contact sports and other high-risk physical activity to prevent retinal detachment</li> <li>• High illumination</li> <li>• Reduced glare</li> <li>• NOIR lenses or overlay filters may be helpful</li> <li>• Video magnifier for maximum contrast</li> <li>• Night vision devices (e.g., Streamlight flashlights, Third Generation® Night Vision Devices, etc.)</li> <li>• Visual efficiency training in organized search (grid) patterns</li> <li>• Orientation and mobility evaluation at night and in dimly lit places</li> <li>• For central vision loss: magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• For peripheral field loss: increase viewing distance to see more area.</li> </ul>
<p><b>Retinoblastoma</b></p> <p>A rare type of cancer in which malignant cells grow in the retina</p>	<ul style="list-style-type: none"> <li>• Strabismus is one of the first signs of retinoblastoma.</li> <li>• Restricted fields due to removal of tumors</li> <li>• Blind spots (scotomas) due to removal of small tumors</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid contact sports and other high-risk physical activity to prevent retinal detachment</li> <li>• Orientation and mobility evaluation at night and in dimly lit places recommended</li> <li>• May need visual efficiency training to develop scanning skills</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>It usually develops in early childhood. The majority of children who develop this cancer have mutations only in eye cells (non-germinal). They will not pass on the mutation, and usually, retinoblastoma develops only in one eye. When the mutation occurs in all body cells (germinal retinoblastoma), the disease is hereditary. These children are more likely to develop retinoblastoma in both eyes, pineal brain tumors (trilateral retinoblastoma), and other forms of cancer anywhere in the body. Current treatments include surgery, radiation, and chemotherapy. Retinoblastoma can become life threatening if the tumor extends beyond the eye, so enucleation is frequently necessary.</p>	<ul style="list-style-type: none"> <li>• With monocular vision, there is no depth perception and visual field is restricted.</li> <li>• Blindness</li> <li>• Medications can negatively affect residual vision.</li> </ul>	<ul style="list-style-type: none"> <li>• Support of eccentric viewing</li> <li>• May need magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• May benefit from access to auditory materials</li> <li>• May require instruction in tactile learning and braille</li> </ul>
<p><b>Retinopathy of Prematurity (ROP, retrolental Fibroplasia)</b></p> <p>Incomplete development of the blood vessels of the retina</p> <p>It occurs in premature infants. The vessels also may grow abnormally from the retina into the back of the eye. They may bleed into the eye, scar tissue may develop, and retinal detachment may occur. The major risk factors are degree of prematurity and</p>	<ul style="list-style-type: none"> <li>• Retinal scarring</li> <li>• Decreased visual acuity</li> <li>• Severe myopia</li> <li>• Field loss</li> <li>• Partial or complete retinal detachment</li> <li>• Blind spots (scotomas)</li> <li>• Strabismus</li> <li>• Total blindness</li> <li>• May develop glaucoma</li> </ul>	<ul style="list-style-type: none"> <li>• Early intervention and sensory stimulation</li> <li>• Avoid contact sports and other high-risk physical activity to prevent retinal detachment</li> <li>• Nighttime orientation and mobility evaluation</li> <li>• May need visual efficiency training to develop scanning skills</li> <li>• Visual efficiency training in organized search (grid) patterns</li> <li>• Adequate to high illumination (e.g., lamps with rheostats and adjustable arms)</li> <li>• Reduced glare</li> </ul>



Eye Condition	Effects on Vision	Education Considerations
<p>low birth weight. There are five stages of ROP, ranging from mildly abnormal blood vessel growth in stage one to retinal detachment in stage five. ROP may be associated with other issues caused by incomplete development. Lasers or freezing (photocoagulation and cryotherapy) may be used to stop the abnormal blood vessels from continuing to grow. Also, surgery may be done to re-attach the retina.</p>		<ul style="list-style-type: none"> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> <li>• Frequent breaks from visual tasks</li> <li>• May benefit from access to auditory materials</li> <li>• May need instruction in tactile learning and braille</li> <li>• May benefit from magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Reduced glare</li> <li>• Night vision devices (e.g., Streamlight flashlights, Third Generation® Night Vision Devices, etc.)</li> <li>• Balance need for a larger viewing area with the need for magnification</li> <li>• Balance need for close viewing against the need for increased distance and a larger portion of the text or pictures</li> <li>• Adapted color-dependent activities</li> <li>• Alternate methods for matching clothing</li> <li>• Support of eccentric viewing</li> </ul>
<p><b>Retinoschisis</b></p> <p>A degenerative disorder in which the retina splits into two separate layers, resulting in progressive loss of vision, beginning in the fields that correspond to the areas where the retina splits.</p>	<ul style="list-style-type: none"> <li>• Strabismus</li> <li>• Nystagmus</li> <li>• Central field loss</li> <li>• Peripheral field loss</li> <li>• Reduced visual acuity</li> <li>• Reduced color discrimination</li> <li>• Blind spots (scotomas)</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid contact sports and other high-risk physical activity to prevent retinal detachment</li> <li>• May need visual efficiency training to develop scanning skills</li> <li>• May need visual efficiency training in organized search (grid) patterns</li> <li>• Adequate lighting (e.g., lamps with rheostats and adjustable arms)</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>The hereditary form (juvenile X-linked retinoschisis) affects mostly boys and young men. The more common form can affect both men and women, and it usually is acquired in middle age or older (senile retinoschisis). Both forms may be associated with cysts (sack-like blisters) that form a spoke-like pattern in the retina. Retinal detachments can occur, and if detected early, they sometimes can be repaired with surgery. Prismatic glasses may be prescribed to increase field of vision.</p>	<ul style="list-style-type: none"> <li>• Blindness</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced glare</li> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> <li>• Frequent breaks from visual tasks</li> <li>• May benefit from access to auditory materials</li> <li>• May need instruction in tactile learning and braille</li> <li>• For central vision loss:</li> <li>• Nighttime orientation and mobility evaluation</li> <li>• Magnification (e.g., hand-held lighted magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• High illumination</li> <li>• Night vision devices (e.g., Streamlight flashlights, Third Generation® Night Vision Devices, etc.)</li> <li>• Adapted color-dependent activities</li> <li>• Alternate methods for matching clothing</li> <li>• For peripheral field loss:</li> <li>• Increase viewing distance to see more area</li> <li>• Support of eccentric viewing</li> <li>• Balance need for a larger viewing area with the need for magnification</li> </ul>
<p><b>Rod Achromacy</b></p> <p>See <a href="#">Achromatopsia</a></p>		
<p><b>Scotoma</b> (pl. scotomata, scotomas)</p>	<ul style="list-style-type: none"> <li>• May affect central or peripheral fields</li> </ul>	<ul style="list-style-type: none"> <li>• Visual efficiency training to develop scanning skills</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>A portion of the visual field that is blind or partially blind and surrounded by relatively normal vision, depending on the presence of other eye conditions</p> <p>Scotomas can occur in any part of the visual field. They can be caused by retinal disorders, tumors, stroke, or traumatic brain injury.</p>	<ul style="list-style-type: none"> <li>• Reduced acuity</li> <li>• May cause loss of detail</li> <li>• May cause photophobia</li> <li>• May cause reduced color vision</li> </ul>	<ul style="list-style-type: none"> <li>• Support of eccentric viewing</li> <li>• Seating and presentation of work should favor more functional eye</li> <li>• May need to use sunglasses, visors, or hats outdoors and indoors as well</li> <li>• Reduced glare</li> <li>• May need lighting from behind using adjustable lamps with rheostats and adjustable arms</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• May benefit from enlarged printed materials</li> <li>• May benefit from close viewing</li> <li>• High contrast materials</li> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> <li>• May need adapted color-dependent activities</li> <li>• May need alternate methods for matching clothing</li> </ul>
<p><b>Septo-Optic Dysplasia</b></p> <p>See <a href="#">Optic Nerve Hypoplasia</a> and "<a href="#">Syndromes</a>"</p>		
<p><b>Strabismus</b> (muscle imbalance)</p> <p>Abnormal alignment of the eyes; an inability to look at the same point in space with both eyes at the same time</p>	<ul style="list-style-type: none"> <li>• Impaired ability to achieve binocular vision</li> <li>• Decreased depth perception</li> <li>• Affects eye-hand coordination</li> <li>• Difficulty fixating</li> </ul>	<ul style="list-style-type: none"> <li>• Orientation and mobility evaluation recommended, specifically for negotiation of drop-offs and stairs in unfamiliar places</li> <li>• Vision efficiency training in scanning, tracking, and tracing</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>It can be caused by a defect in the extra-ocular muscles or in the part of the brain that controls eye movement. It can be hereditary, and it may be associated with brain tumors, cerebral palsy, Down syndrome, extreme farsightedness, cataracts, or having much better vision in one eye than in the other. Strabismus includes:</p> <ul style="list-style-type: none"> <li>• “phorias” – muscle imbalances that are controlled by the brain's efforts toward binocular vision. Not always present, they tend to manifest when the person is tired.</li> <li>• “tropias” - observable deviations that the brain cannot resolve. They are always present.</li> <li>• Eso – turned inward/nasal (esophoria and esotropia)</li> <li>• Exo – turned outward/temporal (exophoria and exotropia)</li> <li>• Hyper – turned upward (hyperphoria and hypertropia)</li> <li>• Hypo – turned downward (hypophoria and hypotropia)</li> </ul> <p>Treatments can be effective for young children: eye exercises, occlusion of the better eye, medications, and surgery.</p>	<ul style="list-style-type: none"> <li>• May have difficulty scanning, tracking, and tracing</li> <li>• Difficulty following fast-moving objects</li> <li>• Difficulty making eye contact</li> </ul>	

Eye Condition	Effects on Vision	Education Considerations
<p>Prismatic glasses may be prescribed to increase field of vision.</p>		
<p><b>Toxoplasmosis</b></p> <p>Congenital or acquired inflammation of the retina and choroid (retinochoroiditis), which can cause retinal scarring</p> <p>Toxoplasmosis is caused by infection with the toxoplasma parasite found in animal feces and unpasteurized milk. Unborn babies are most vulnerable to the infection, and it can cause damage to the brain, eyes, or other organs. Treatments include anti-inflammatory medications, photocoagulation (laser) therapy, and cryotherapy (freezing).</p>	<ul style="list-style-type: none"> <li>• Scotomas</li> <li>• Peripheral field loss</li> <li>• Central field loss</li> <li>• Loss of visual acuity</li> <li>• Decreased color vision</li> <li>• Photophobia</li> <li>• Increased sensitivity to glare</li> </ul>	<ul style="list-style-type: none"> <li>• Visual efficiency training to develop scanning and eccentric viewing skills</li> <li>• Reduced glare</li> <li>• May need lighting from behind using adjustable lamps with rheostats and adjustable arms</li> <li>• Magnification (e.g., microscopic lenses, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• May benefit from enlarged printed materials</li> <li>• May benefit from close viewing</li> <li>• High contrast materials</li> <li>• High contrast line markers or templates for reading, finding math problems, or locating other information</li> <li>• May need adapted color-dependent activities</li> <li>• May need alternate methods for matching clothing</li> </ul>
<p><b>Trachoma</b></p> <p>A contagious bacterial infection of the eyes and eyelids, causing scarring and buckling of the eyelids</p> <p>This causes the eyelashes to turn under, which leads to corneal scarring. Repeated and prolonged infection causes permanent visual impairment and blindness. Trachoma is spread through direct contact with</p>	<ul style="list-style-type: none"> <li>• Photophobia</li> <li>• Fracturing or scattering of light (as in looking through a broken windshield)</li> <li>• Increased glare</li> <li>• Blurred vision</li> <li>• Reduced acuity</li> </ul>	<ul style="list-style-type: none"> <li>• Sunglasses, visors or hats outdoors, and indoors as well</li> <li>• Reduced or diffused lighting from behind (e.g., lamps with rheostats and adjustable arms)</li> <li>• Front row seating with back toward windows</li> <li>• Reduced glare</li> <li>• High contrast materials</li> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Enlarged printed materials</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>secretions from the eyes, eyelids, or nose of an infected person. It is the leading cause of preventable blindness worldwide.</p>		<ul style="list-style-type: none"> <li>• Frequent breaks from visual tasks</li> <li>• Support of eccentric viewing</li> <li>• Auditory materials for long reading assignments</li> <li>• May need instruction in tactile learning and braille</li> </ul>
<p><b>Uveitis</b></p> <p>Inflammation of the uveal tract (middle layer of the eye), which consists of the iris, choroid, and ciliary body</p> <p>The most common form affects the iris, and it may be called anterior uveitis or iritis. The cause may be unknown. Known causes include autoimmune disorders, infection, toxoplasmosis, tuberculosis, and histoplasmosis. Complications can cause glaucoma and damage to the retina or cornea, leading to permanent vision loss.</p>	<ul style="list-style-type: none"> <li>• Photophobia</li> <li>• Blurred vision</li> <li>• Floaters</li> <li>• Decreased acuity</li> <li>• Glaucoma</li> <li>• Retinal scarring</li> <li>• Corneal damage</li> </ul>	<ul style="list-style-type: none"> <li>• High contrast materials</li> <li>• Reduced glare</li> <li>• Allow additional time for adjustment to new visual conditions</li> <li>• Use of lamps with rheostats and adjustable arms</li> <li>• May need visual efficiency training to develop scanning and eccentric viewing skills</li> </ul>
<p><b>Wilms' Tumor</b> (nephroblastoma)</p> <p>Rare abnormalities of the eye, especially aniridia, related to a malignancy of the kidneys</p> <p>Although the cause is sometimes unknown, this form of cancer can be caused by genetic changes, which also can be hereditary. Pinhole contact lenses and sunglasses may be prescribed.</p>	<ul style="list-style-type: none"> <li>• Decreased acuity, further reduced by other conditions</li> <li>• Photophobia</li> <li>• Large pupil (misshapen)</li> <li>• With corneal involvement: Fractured light, increased glare, blurred vision</li> <li>• With cataracts: blurred vision, and decreased color vision</li> <li>• Fovial involvement: loss of detail vision</li> </ul>	<ul style="list-style-type: none"> <li>• Vision stimulation for infants to develop the visual cortex</li> <li>• Sunglasses, tinted contact lenses, visors or hats in bright light outdoors and indoors</li> <li>• Allow time for adjustment to lighting changes</li> <li>• Front row seating with back to windows</li> <li>• Reduced glare</li> <li>• Provide reduced or diffused lighting from behind</li> <li>• Lamps with rheostats and adjustable arms</li> </ul>

Eye Condition	Effects on Vision	Education Considerations
<p>See "<a href="#">Syndromes</a>" for associated conditions.</p>	<ul style="list-style-type: none"> <li>• With glaucoma: fluctuating visual functioning, field loss, poor night vision, and decreased sensitivity to contrast</li> <li>• May have nystagmus</li> <li>• May have ptosis</li> </ul>	<ul style="list-style-type: none"> <li>• Magnification (e.g., hand-held magnifier, electronic magnifier, screen enlargement software, telescope, etc.)</li> <li>• Use a blackboard and bold chalk</li> <li>• Use of bold, black markers on a white board</li> <li>• Felt-tipped pens and tinted paper with bold lines</li> <li>• Use of dark or black background</li> <li>• Provide copies of materials presented on the board.</li> </ul>