

Blind/Visually Impaired

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Blind/Visually Impaired

Any loss of ability to gather information by seeing might be considered a visual impairment

<p><u>Total Blindness</u> - vision loss that is permanent and uncorrectable. People who are considered totally blind have no light perception whatsoever.</p>	<p><u>Legally blind</u> - is the total or partial inability to see, accuracy less than 20/200 or have a field of vision no greater than 20 degrees in diameter. Some people who are considered legally blind may perceive some motion, shadow, or color.</p>	<p><u>Low vision</u> - is the term used to describe people with moderately impaired vision.</p>
<p><u>Congenitally blind</u> - born with a severe visual impairment</p>	<p><u>Adventitiously/Acquired blind</u> - acquire a severe visual impairment after age two</p>	<p><u>Tunnel vision</u> - the area of vision is restricted to a small central area and peripheral vision is limited</p>

Statistics

- More than 82% of all people who are blind are 50 years of age and older.
- Visual impairment make up about 0.05% of all school children
- Out of the group 5 out of every 1,000 are legally blind
- 4% of all blind people are children
- Over 85% of youngster attends public schools
- Only 8% attends residential center schools
- Females have a significantly higher risk of being visually impaired than males.
- Braille Literacy Program
 - Only 10% of the blind can read Braille



Physical Structures of the Eye and Visual Acuity

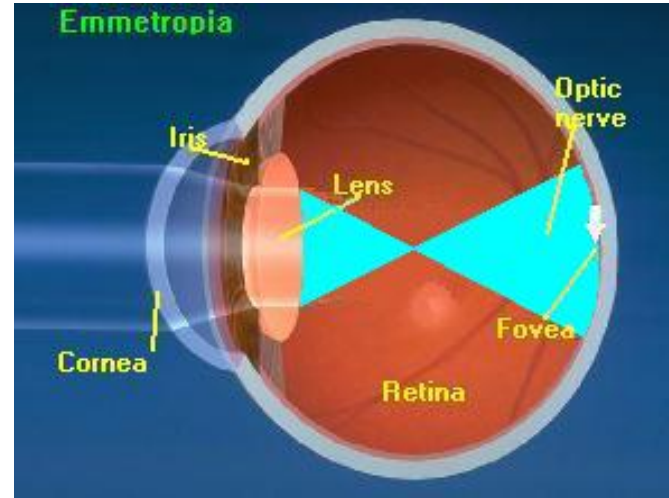
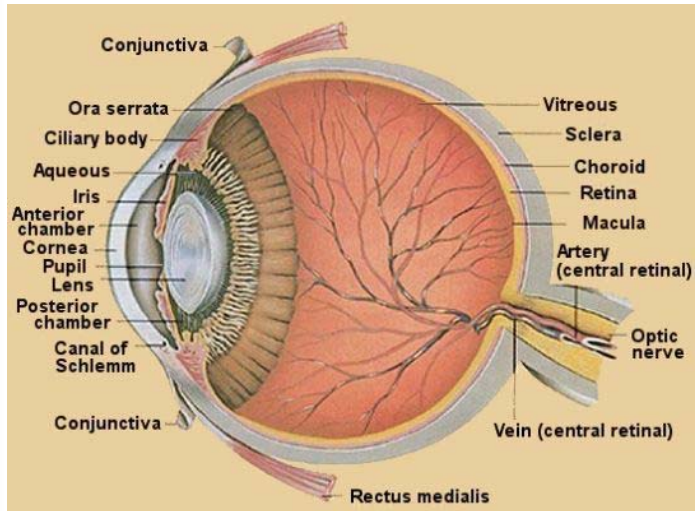
- How the eye works
- Major physical features of vision and visual perception
 - Measures of vision
- How results are reported and their meaning



How does the eye work?

- The many parts of the eye work together to transform light rays passing through your pupil into information that your brain can interpret.
- The final result is an awareness of the objects around you based on the thin band of the electromagnetic spectrum that we call visible light.
- Before the light gets anywhere near the eye, it bounces off objects and determines its color and brightness.

How does the eye work?



- Light first enters the eye through the cornea which covers the front of the eye and helps to focus the light.
- The light then enters the pupil which dilates or constricts to adjust the amount of incoming light.
- The light then passes through a flexible lens that allows the eye to focus on near or distant objects.
- The light is then focused onto the retina. The retina is composed of light sensitive cells that translate the light into nerve signals.
- This information is then carried to the brain via the optic nerve.

Physical Structures of Vision and Visual Perception

- Cornea – the clear dome on the front of the eye. The cornea needs to be smooth, evenly curved, and clear so that light can pass through it.
- Iris – The colored part of the eye. The function of the iris is to regulate the amount of light that enters the eye.
- Lens – The lens changes shape, getting fatter or thinner in order to help focus the light on the back of the eye. This focusing ability of the eye is called “accommodation”.
- Retina – The inner layer of the back of the eye consists of millions of specialized cells which serve as light receptors.
- Optic Nerve – Consists of millions of nerve fibers and carries the message from the light receptors to the area of the brain associated with vision.

Common Measures of Vision

- The Snellen Chart measures visual acuity (how clearly you see) and is determined by the size of letters you can read and the distance at which you can read them.
- Typical testing distance is 20 ft. from the chart since your eye is relaxed at this distance and the lens of your eye is in its natural position.

Common Measures of Vision for Young Children and Non-readers

- The Lighthouse Flash Card Test For Children works the same way as the Snellen Chart, except with bold line drawings of a circle, an apple, a house, and a square instead of letters and numbers.



Results and what they mean

- People with normal visual acuity can clearly read 3/8" letters or numbers at a distance of 20 feet. They are said to have 20/20 vision because at 20 ft. from the chart they see what a normally sighted person sees.
- When someone's visual acuity is worse than normal, the second number will be larger than 20.
- When someone's acuity is better than normal, the second number will be smaller than 20.

Results and what they mean

- The power of a lens placed in front of the eye to correct for myopia/hyperopia is measured in terms of diopters.
- A diopter is a unit of measurement of the optical power of a lens
- Negative numbers mean myopia (nearsighted)
- Positive numbers mean hyperopia (farsighted)

Major Causes of Blindness & Visual Impairment

- **Retinal Disorders**

- Retinoblastoma
- Retinitis Pigmentosa
- Retinal Detachments
- Retinopathy of Prematurity (ROP) : (formerly called retrolental fibroplasia, or RLF)
- Macular Degeneration
- Diabetic Retinopathy

- **Optic Nerve Disorders**

- Optic Nerve Atrophy
- Hemianopia
- Optic Nerve Gliomas (such as Neurofibromatosis)
- Optic nerve hypoplasia
- Septo-optic dysplasia



- **Disorders of the Brain that Affect Vision**
 - Cortical Blindness
- **Lens Disorders**
 - Congenital Cataracts
- **Cortical Visual Impairment**
- **Pressure Disorders**
 - Congenital Glaucoma
 - Glaucoma (infantile)
- **Color Vision Disorders**
 - Achromatopsia
 - Aniridia



- **Infections**
- **Malformations**
- **Ocular-muscle problems** (*most common is strabismus*)
- **Nystagmus**
- **Ocular trauma**
- **Refractive errors**
- **Other Structural Defects**
 - Hyperopia
 - Myopia
 - Amblyopia (Lazy Eye)
 - Esotropia
 - Astigmatism

- **Syndromes**
 - Trisomy 13
 - Down
 - Ushers
- **Multiple Congenital Anomalies**
 - CHARGE association
 - Fetal Alcohol syndrome
 - Hydrocephaly
 - Maternal drug abuse
 - Microcephaly

- **Prematurely Congenital**
- **Parental Dysfunctions**
 - Aids
 - Herpes
 - Rubella
 - Syphilis
 - Toxoplasmosis
- **Post-natal Causes**
 - Asphyxia
 - Encephalitis
 - Head injury/trauma
 - Meningitis
 - Stroke

What does the world look like to someone who has a vision disorder?

- Vision can be blurred.



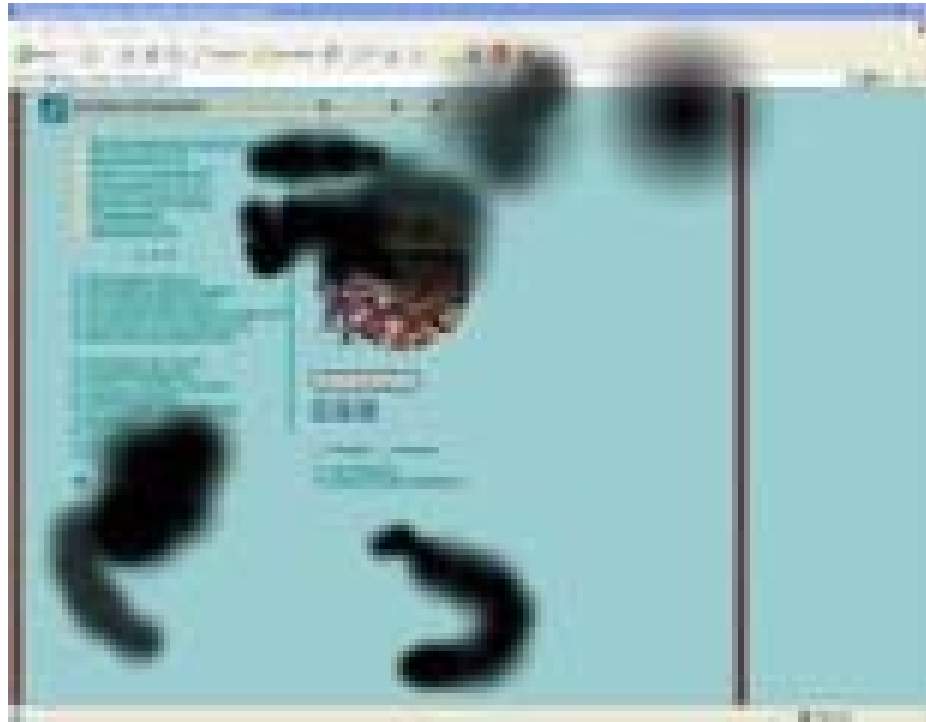
What does the world look like to someone who has a vision disorder?

- Impairment can cause tunnel vision.



What does the world look like to someone who has a vision disorder?

- Vision could be spotted.



Retinol Disorders

Retinoblastoma

- Cancer of the eye
 - Treatable, but may require the removal of the eye
- Causes
 - Hereditary
 - Genetic Mutation
 - Educational Implications
 - Absences
 - Social-emotional
 - School re-entry



Retinal Disorders

Retinopathy of Prematurity

- Disorganized growth of retinal blood vessels resulting in scarring
- Treatment
 - Laser
- Causes –
 - Premature birth
 - Low birth weight
- Educational implications
 - Psychological and social adjustment
 - Prepare student for total blindness
 - Braille
 - Mobility Training

Retinal Disorders

Macular Degeneration

- In children usually referred to as Macular Dystrophy
 - Reduces central vision in the retina
- No current treatment
- Causes
 - Inherited
- Educational Implications
 - Magnifying glass
 - Mobility training
 - Large print
 - Seating

Other Retinal Disorders

- Retinitis Pigmentosa
 - An inherited disorder that causes night blindness or tunnel vision
 - Small print
- Retinal Detachment
 - A tear or hole in the retina that causes fluid to leak
- Diabetic Retinopathy
 - The small blood vessels in the eye are damaged from poor glucose control

Optic Nerve Disorders

Optic Nerve Gliomas - Neurofibromatosis

- Genetic disorder that causes tumors to grow along nerve lines
- No treatment available
- Causes
 - Random mutation of genes
 - Hereditary
- Educational Implications
 - Higher rates of learning disabilities
 - May have seizures
 - Attention problems – clear directions
 - P.E. programs may need to be modified

Lens Disorders

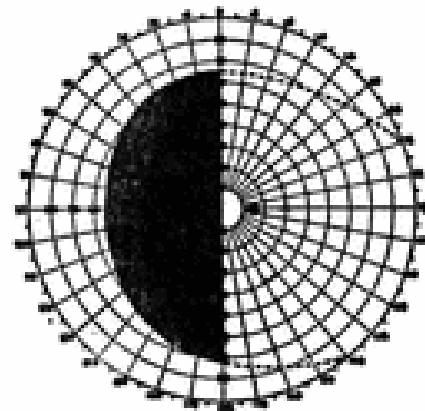
Congenital Cataracts

- A cloudiness in the lens of the eye that is present at, or develops shortly after, birth.
- Causes
 - Infections – rubella, chicken pox, herpes
 - hereditary
- Treatment – Surgery
- Educational Implications
 - Child may be fearful of surgery
 - Vision may improve



Other Optic Nerve Disorders

- Optic Nerve Atrophy
 - Involves tissue death of the nerve that carries visual information to the brain
- Hemianopia
 - Blindness in one half of the visual field of one or both eyes



Disorders of the brain that affect vision

Cortical Blindness

- Total or partial loss of vision
- Treatment – Visual stimulation activities since the condition may improve with age
- Causes
 - Damage to occipital cortex
 - Drug use during pregnancy
 - Infections such as meningitis or encephalitis
 - Lack of oxygen

Pressure Disorders

Congenital Glaucoma

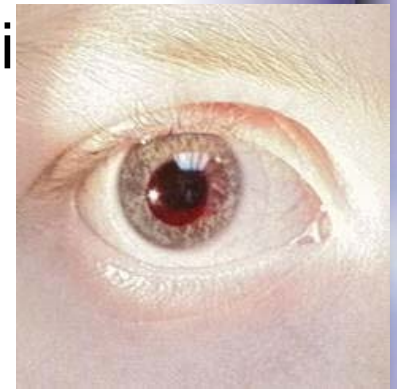
- Increased pressure of the fluid inside the eye which causes degeneration of the optic disk and visual field loss.
- Causes: -sporadically –hereditary
- Treatment: Surgery
- Educational Implications:
 - Photophobic –Poor night vision –Poor peripheral fields
 - Enlarged print material
 - Extra time to complete visual tasks
 - Reading or seeing large objects at close range may be difficult



Pigment Disorders

Ocular Albinism

- Deficiency of pigmentation which affects the retina and iris. The eye lacks melanin pigment, while the skin and hair show normal or near normal coloration.
- Causes: Hereditary
- Treatment: Visual aids and environmental changes
- Educational Implications:
 - Associated with hyperopia, myopia, nystagmus, photophobia (sensitivity to light)
 - Inability to read unless very close
 - Lighting considerations: normal to dim light be preferable



Color Vision Disorders

Achromatopsia

- Results in little or no function of the cone cells of the retina. In the normal eye, there are about six million cone receptors located mostly at the center of the retina. Cones permit light adaptation, color perception and perception of fine detail. Individuals with achromatopsia are either partially or totally color blind.
- Causes: Hereditary
- Treatment: Red central contact lenses
Low Vision Rehabilitation: tints, filters, hats and visors to control light sensitivity



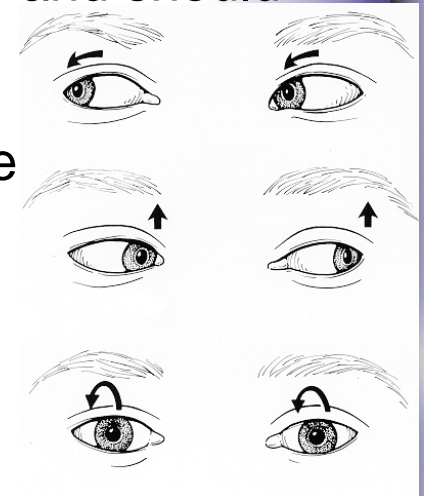
Color Vision Disorders

Achromatopsia

- Educational Implications:
- Students may have possible nystagmus, difficulty or inability to see colors, extreme photophobia, near vision is generally less affected than distance vision
- Visual tasks will cause fatigue
- Glare must be avoided
- Rest periods may be needed when doing close work
- Low vision aids may be needed
- Print materials may need to be enlarged with high contrast
- Lighting will be a major factor in the student's visual functioning
- Tasks requiring color vision may need to be adapted or modified
- Student may need extra time to complete visual tasks
- Students may need time to adjust to changes in lighting
- Student must be permitted to wear sunglasses, visors, etc. in school, if desired

Nystagmus

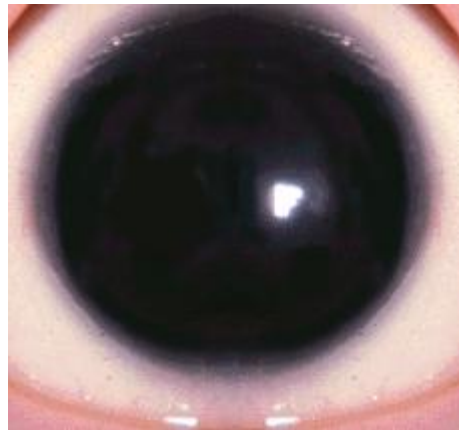
- Rhythmical, involuntary movement of one or both eyes which results in some degree of visual loss.
- Causes: Can be present at birth or be related to other eye disorders
- Treatment: Contact lenses, eyeglasses, or eye muscle surgery are possible treatments but may not alleviate nystagmus
- Educational Considerations:
 - Eye fatigue when asked to use vision continuously
 - Stress or spinning movements increase nystagmus and should be avoided when fixation is required
 - Large print materials may be helpful
 - Print materials should be as uncluttered as possible
 - Reading/writing assignments should be kept as brief as possible to reduce stress and eye fatigue



Color Vision Disorders

Aniridia

- A condition in which the iris does not completely form. The iris is the colored part of the eye. It controls the amount of light entering the eye by varying the degree of the papillary opening.
- Causes: Hereditary
- Treatment: Pinhole contact lenses; tinted lenses and/or sunglasses; optical aids; lower illumination levels to control glare



Color Vision Disorders

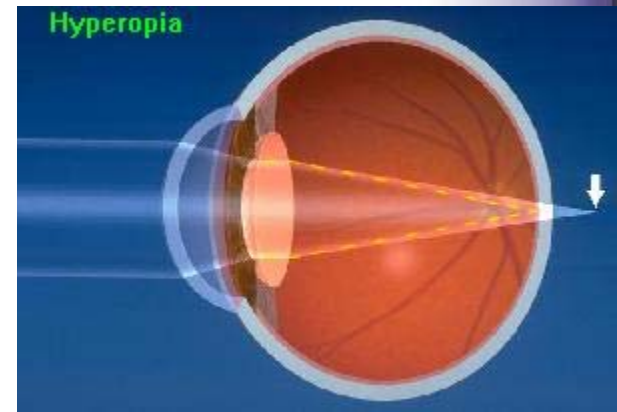
Aniridia

- Educational Considerations:
 - Students have a decreased visual acuity, nystagmus, photophobia, field loss corresponding to the area where the iris is absent
 - Lighting will be a major factor in visual functioning. Normal or dim lighting may be preferable
 - Students will need to adapt to changes in lighting; recover from glare is slow and eye fatigue may be a concern

Structural Defects

Hyperopia

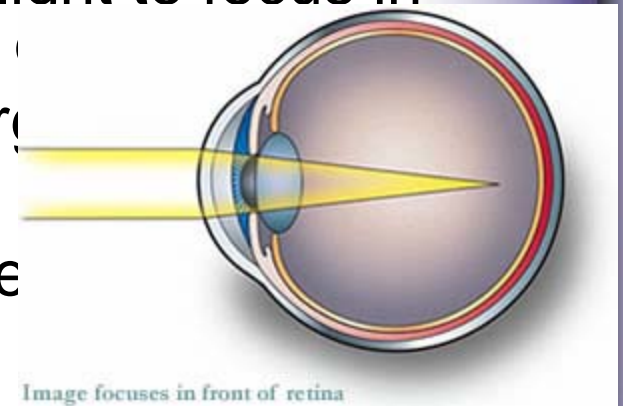
- Individuals are able to see distant objects but have difficulties with things close to them (Farsightedness)
- Causes: Occurs when light rays entering the eye focus behind the retina, rather than directly on it. Family history also contributes to hyperopia
- Treatment: Corrective lenses or surgery
- Educational Considerations:
 - Student may need extra time to complete visual tasks
 - Student may need to sit further away from the board or demonstrations
 - Student may need alternate assistance or alternate ways to take notes



Structural Defects

Myopia

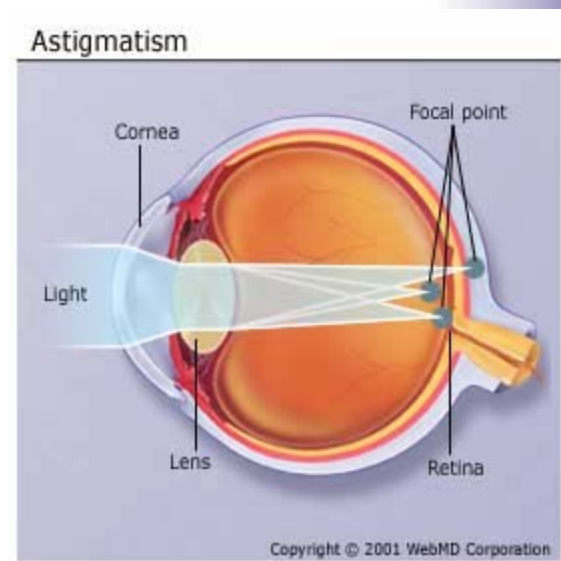
- It causes an individual to not be able to see things far away from them as clearly as things which are close to them.
- Causes: It occurs when the cornea/lens is too curved or the eye is too long. This causes light to focus in front of the retina, resulting in blurry vision.
- Treatment: Corrective lenses or surgery.
- Educational Considerations:
 - Student may need to sit closer to the board or demonstrations
 - Student may need extra time to complete visual tasks



Structural Defects

Astigmatism

- The primary cause of astigmatism is the cornea being shaped more like a football than being rounded. Light entering the eye will not be bent equally in all directions, resulting in distorted vision.
- Causes: Hereditary
- Treatment: Corrective lenses
- Educational Implications:
- Myopia or hyperopia
- Lack of depth perception may cause some difficulty
- Visual fatigue may be experienced when performing visual tasks
- Doing close work and reading may cause headaches



Accommodations

- The effects of visual impairment can be managed with the use of special material:
 - Braille
 - large print
 - audio devices
 - computer technology
- Special arrangements may be required to accommodate
 - daily living
 - socialization
 - orientation
 - message
 - mobility
 - education



Educational Implications

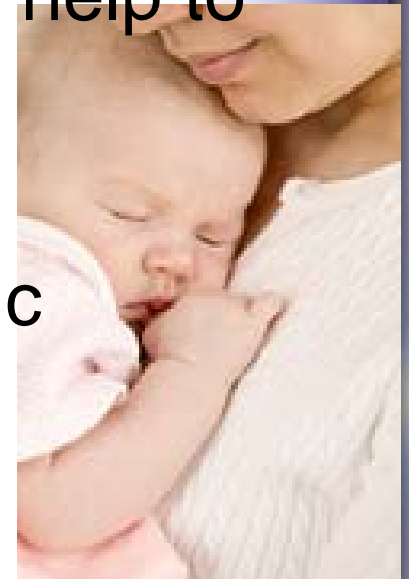
- Large print books
- Child has own materials
- Board Writing
 - Verbalize visual information
 - repetition
- Positioning
- May need more time
 - breaks
- May have trouble seeing facial expressions

Educational Implications

- Activity Modification
- Braille
- Mobility training
- Relate new material to familiar objects
- Use bold colors
- When reading mark start and stop points

Prevention may be the key

- Regular vision screenings
- Safety measures
- Access to good health care to prevent illness which can cause blindness
- Prenatal care and proper diet can also help to ensure the health of the unborn child
- Vaccinations
- Knowing hereditary syndromes/ genetic diseases



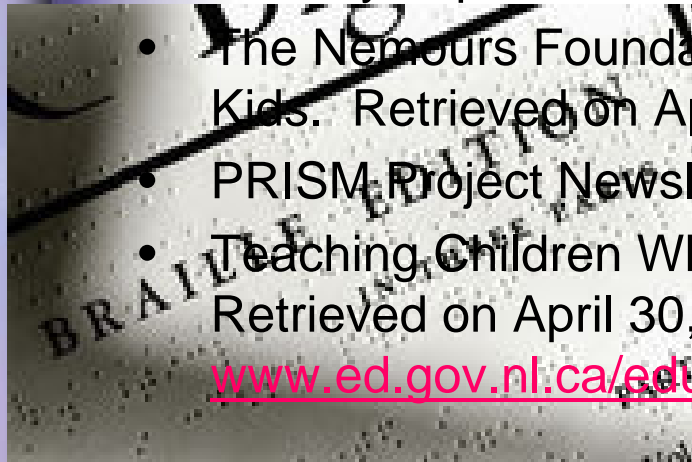
Good Internet Sites

- Educating Blind and Visually Impaired Students – Policy Guidelines
 - Legal issues related to the education of person who are blind and visually impaired
 - <http://www.ed.gov/news/fedregister/index.html>
- KidsHelp for Kids
 - <http://www.kidshealth.org>
- Kidstone Kids:
 - Info for students, teachers, and parents
 - <http://www.keystoneblind.org/>

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“Alone we can do so little,
together we can do so much.”

Helen Keller

