

VISION SCREENING IN MAINE SCHOOLS

Evidence-Based Guidelines for Preschool and School-Aged Students



MAINE DEPARTMENT OF EDUCATION

OFFICE OF SCHOOL AND STUDENT SUPPORTS

COORDINATED SCHOOL HEALTH



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Vision Screening in Maine Schools

Evidence-Based Guidelines for Preschool and School-Age Students

The Maine Department of Education provides this *Vision Screening in Maine Schools: Evidence-Based Guidelines for Preschool and School-Aged Students* in accordance with <u>Maine Revised Statutes (MRS) Title 20-A section 6403-A (5)</u> which directs the Commissioner of Education to issue guidelines on the provision of school health services and health-related activities.

Introduction

Vision screening is conducted at school to identify students who are at risk for having a vision or eye health disorder that could interfere with learning. The following guidelines will inform the school nurse of evidence-based vision screening, with the goal of ensuring consistency in screening and referral processes in Maine schools. Screening does not replace the need for a comprehensive eye exam. A confirmatory dilated eye examination for a full evaluation and possible diagnosis should follow a referral. Treatment, monitoring, and ongoing follow-up by an eye care provider (an optometrist or an ophthalmologist) can help ensure students have the best vision possible for their academic achievement. Evidence-based tools and procedures, as well as parent/guardian understanding and adherence to treatment plans and collaboration with local eye care providers, can support equitable access to vision healthcare and improve student's experience in school.

The school nurse is responsible for complying with all federal, state, and local laws, rules regulations, as well as relevant standards of practice. This document was created in collaboration with P. Kay Nottingham Chaplin, EdD. In addition to this collaboration, information was obtained through a literature review of the most current content available

from the National Center for Children's Vision and Eye Health, the National Association of School Nurses (NASN), the American Academy of Ophthalmology (AAO), and other professional sources, to support best practices in vision screening in Maine schools. While this document intends to summarize currently available resources for the school nurse, it does not replace clinical nursing judgment for their practice.





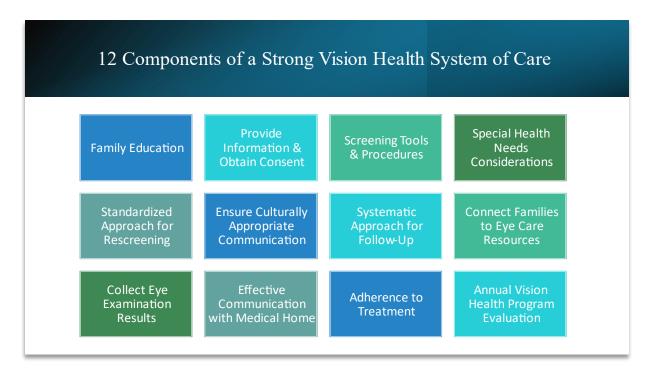
Legislation

In accordance with MRS 20-A §6451 the Commissioner of Education, in collaboration with the School Nurse Consultant and consultation with the Commissioner of Health and Human Services, has adopted Rule for Vision and Hearing Screening in Maine Schools 05-071 C.M.R. Ch. 45 (2018). Chapter 45 outlines standards and procedures for the implementation of 20-A M.R.S. §6451 to §6453 which requires periodic health screenings to identify students that may have a vision or hearing impairment.

These guidelines define the nurse's responsibilities in health screening practices in schools, along with the provision of general guidance such as intervals for screening, approved tools, and referral processes. Established public preschool (PreK) standards require that children in PreK must be screened within the first 30 days of attendance.³ Students transferring to the school without a record of previous screening should be screened.

Vision Screening

Early detection with timely follow-up of a vision disorder can ensure the best vision outcomes.⁴ When students have undetected vision deficits, early learning, and literacy skills can be delayed. Consequences can include impaired intellectual, social, emotional, and physical development, and can affect the student throughout their lifetime.⁴ Establishing a vision screening program that incorporates 12 components centered around student and family has been highlighted as best practice.^{2,5} These components outline education, communication, tools and procedures, and a standardized approach to rescreening, referral, and follow-up and are represented in the table below.^{2,5}





Communication and Access to Care

The National Association of School Nurses (NASN) defines school nurses as "grounded in ethical and evidence-based practice, are the leaders who bridge health care and education, provide care coordination, advocate for quality student-centered care, and collaborate to design systems that allow individuals and communities to develop their full potential." Educating the school community, students, and families on the importance of health screenings and follow-up after referral is just one part of that bridge.

Sharing culturally appropriate education materials in multiple forms, like those found on the NASN: Vision and Eye Health webpage prepares families for screenings, possible referrals, and follow-up. School Administrative Units (SAUs) are encouraged to use more than one means of communication to inform families of the school's requirement to perform health screenings. Each SAU may choose the vehicle of communication; examples are included on the resource page. Parents may object to screenings in writing. Written objections should be honored by SAUs unless an obvious concern is observed. In accordance with the Department of Education Rule for Vision and Hearing Screening in Maine Schools 05-071 C.M.R. Ch. 45 (2018), if a sight or hearing deficit is apparent, the best practice is to communicate concerns with families along with the rationale of the obligation to screen. Communication and collaboration are of greatest importance in school nursing practice, and health screenings are no exception.

Nursing Role

Care coordination by the school nurse in Maine schools is not limited to acute and chronic health conditions, it is also highlighted in prevention. The expanding roles of the school nurse include organizing care, providing access to care, assisting with health insurance, and educating staff, students, and communities.⁷

Utilizing the <u>Decision Tree</u> the school nurse may determine appropriate unlicensed school personnel (USP) to train and assist with screening. Professional organizations and local community partners may be utilized when appropriate. In some cases, an individualized health plan (IHP) may be indicated to support student-specific needs. This is created in collaboration with an eye care professional, family, and student.





Other responsibilities of the school nurse, according to 05-071 C.M.R. Ch. 45 (2018) follow.

- Direction and oversight of the health screening program in school
- Follow up with referred students, for evaluation and potential treatment
- Follow up with parents of referred students
- Annual reporting to the Maine Department of Education:
 - The number of students screened by type of screening
 - The number of students referred
 - The number of referred students confirmed

The school nurse may use the information within this document to inform and build knowledge on best practices, evidence-based tools, and <u>referral</u> criteria.³ As the professional healthcare provider in the school, the school nurse is in the optimal position to train USPs and provide oversight. School nurses should seek professional learning to improve their skills and stay current with best practices.

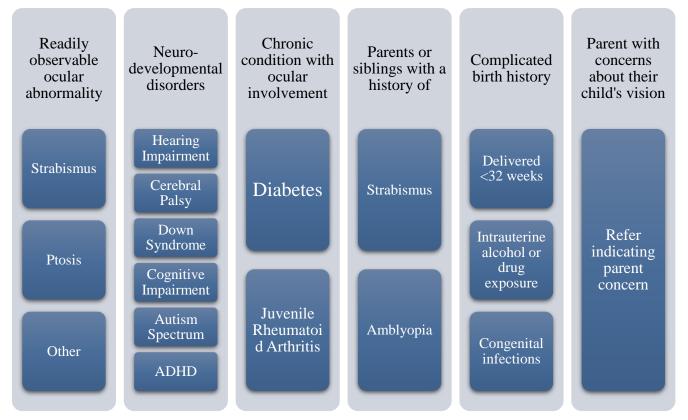
More information for school nurses interested in professional development; self-paced modules, module assessments, and instructional videos can be accessed on the Prevent Blindness website: NCCVEH: Vision Screening Certification

Preparation

The planning process is a key element for successful and efficient implementation of schoolbased vision screening programs. As a public health advocate, the school nurse applies the Centers for Disease Control and Prevention (CDC) Whole School, Whole Community, Whole Child (WSCC) framework when approaching vision screening in school and promoting eye health, which can help establish a life of healthy behaviors for students, families, and communities.⁸⁻¹⁰ School-based vision programs (SPVPs) often partner with community organizations and families, as well as the medical home to establish services within the school setting, connecting students to professional care, evaluation, and treatment needed. 11 These programs provide on-site access to eye exams for students who received screening referrals along with eyeglass prescriptions when indicated. 11 School nurses are well-positioned and may advocate to develop and implement an SBVP, advancing health equity in Maine schools. 11 Beginning considerations when preparing to screen students, is to identify students that should bypass screening. Students who have had a comprehensive eye examination within the last year do not need to be screened.³ Below is a representation of students who should bypass screening and be directly referred for a comprehensive, dilated eye exam, as they are at a higher risk for vision disorders.^{2, 3, 12}



Children Who Should Bypass Screening



Once the school nurse determines direct referrals, the total number of students to be screened per grade should be tallied. Evaluate the following:

- Volume of students
- Timeline for screening
- Location of the screening room related to classrooms
- Considerations for helpers in the halls

Identifying and organizing resources includes considerations regarding equipment needed for screening as well as the environment, age of students, class schedules, and potential staff or volunteers who may need to be trained to assist. When selecting a room to screen students, care should be taken to ensure the room is sufficiently lit from above, avoiding competing light sources or glare. Best practice is to use a lightbox, or light stand for testing visual acuity. ¹³ If possible, choose a room free of sounds and distractions. If students will be handling any equipment, have access to sinks for hand washing or hand sanitizer available for students to use before and after screening. Ensure the availability of cleaning materials, according to the manufacturer's recommendations, for wiping equipment between use. Determine how documentation will take place on the day of screening and plan accordingly.



Approved Equipment

In accordance with 05-071 C.M.R. Ch. 45 (2018), schools will screen utilizing evidence-based optotype or instrument-based tools. The following table includes approved evidence-based tools and the appropriate age of students to screen with each tool. $^{3,\,14\text{-}16}$

Occluders

Age	<u>Tool</u>	Illustration	<u>Notes</u>
All Ages	Adhesive Patches or 2-inch-wide surgical tape	Nexcare Optichuse Supering grant Supering g	If a student is wearing prescription glasses, place a patch or tape under the glasses to cover the eye. ^{14, 15}
Ages 3 to 10 years	Frosted Glasses	Section for the section for th	If a student is wearing prescription glasses, place them over the glasses. 14, 15
Ages 10 years and older	"Lollipop" and "Mardi Gras" Mask		If a student is wearing prescription glasses: Place the "lollipop" occluder over the eye and under the glasses with the handle pointed toward the ear. Place the "Mardi Gras" Mask over the glasses. 14, 15



Distance Visual Acuity

<u>Grade</u>	<u>Tool</u>	Illustration
PreK Kindergarten Any student who is unable to identify letters in random order	LEA SYMBOLS® or HOTV Proportionally Spaced Charts at 10 feet. ¹⁵	VOHUT HOV THOUSE STATE OF THE TOTAL
All grades above KG	Sloan Letters are proportionately spaced at 10 feet. When you reach the 2 smaller sets of lines you may use the full middle chart if available, or use the right side when screening the right eye and the left side when screening the left eye. ¹⁵	ZRKDC ZRKDC DNCHV CDHNR RVZOS NOZCD NOZCD NOZCD SVKON DNSVZ NOZCD SVKON DNSVZ SVKON D
All grades	Sight Line Kit (10 feet) - Includes LEA SYMBOLS® and Sloan Letters. 15	ODGOOD WILL AS THE STATE OF THE
All grades	Illuminated Cabinet Use with 9" x 14" charts. ¹⁵	O Ø □ O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O



Near Visual Acuity

Age	<u>Tool</u>	Illustration
All ages	LEA SYMBOLS® or HOTV until students can identify letters in random order. May use Sloan letters at 6 years and older, at 16 inches from eyes, measured by holding cord at the temple.	Company Com
	When you reach the 2 smaller sets of lines, you can continue using the full middle chart if available or use the right side when screening the right eye and the left side when screening the left eye. ¹⁵	Z R K D C D N O H Z V O O H Z V O N O N C V O N O N C V O N O N C V O N O N C V O N O N C V O N O N C V O N C

Computer-Based

<u>Age</u>	<u>Tool</u>	Illustration
<u>All ages</u>	GLD-Vision® Web- Based, Computerized Vision Screening. ³ GLD-Vision®	Epus py 29/26 Numbersearing manufat The state of the st



Instrument-Based

<u>Age</u>	<u>Tool</u>	Illustration
3 to 5 years	Welch Allyn Spot™ Vision Screener Checking for an estimate of refractive error, and eye misalignment. 15, 16	
3 to 5 years	GoCheck Kids Checking for estimate of refractive error and eye misalignment. 15,16	
3 to 5 years	Plusoptix S12C, S12R, S16 [S12C shown] Checking for estimates of refractive error and eye misalignment. 15,16	

Image sources:

https://store.good-lite.com/products/300407

https://nationalcenter.preventblindness.org/wp-content/uploads/sites/22/2021/07/vision_screening_table2021.pdf https://preventblindness.org/instrument-based-vision-screening/



Procedure

In advance of visual acuity screening, family members, educators, and nurses observe for subtle signs of possible vision problems and respond by scheduling comprehensive eye examinations.¹⁷ Observation can identify changes in appearance, student behavior, or physical changes.¹⁷ See the <u>resource</u> page for a full visual representation of observational signs provided by Prevent Blindness.

While screenings are mandated at certain intervals throughout the academic career, any student can and should be screened when a vision impairment is suspected. Observation can sometimes detect more than acuity screening; therefore, if a student passes screening but observation suggests otherwise, refer for a comprehensive eye examination.¹⁷ It is necessary to be mindful that referrals can unintentionally cause stress and should be

Near Vision Acuity

Screening must occur in grades 1 and 3

Recommended in kindergarten and grade 5

Distance Vision Acuity

Screening must occur in PreK, kindergarten, and grades 1, 3, 5, 7, and 9³

approached with sensitivity related to culture, ethnicity, as well as personal and social identity.^{18, 19} To learn more about trauma-informed care please visit NASNs Trauma-Informed Care in School Nursing [Enduring].

NASN's position statement further validates that "school nurses possess the skill and judgment to identify and address the structural and systemic barriers that impact the attainment of safe, supportive, and equitable school environments which contribute to students' ability to achieve wellness and academic success." ¹⁹

Visual acuity is measured by the ability to identify black letters, numbers, or figures (optotypes) on a white background at a specified distance.²⁰ There are two approaches to vision screening: critical line and threshold screening. The critical line method uses only the line that the student must identify three of five optotypes and is documented as pass or refer.²¹ Threshold screening begins at the top of an eye chart, identifying optotypes as the student moves down the chart until the student cannot identify three of five optotypes correctly and is documented as 20/xx.²¹ The preferred technique for near vision screening is monocular threshold screening, which is screening one eye at a time. ^{15,21,22}

Referral Criteria for Both Near and Distant Visual Acuity

Age 3	20/50 Line	Unable to identify at least 3 of 5 optotypes on 20/50 line
Age 4-5	20/40 Line	Unable to identify at least 3 of 5 optotypes on 20/50 line
Ages 6 and up	20/32 Line	Unable to identify at least 3 of 5 optotypes on 20/50 line

If using the threshold screening method, refer any student with a 2-line difference between eyes.³



Standard Universal Protocol

- Provide a well-lit room without distraction.
- Best practice is to use a lightbox, or lighted stand for testing visual acuity.
- Screening tools are held at a 90° angle, not tilted, or subject to glare from windows or other light sources, and the passing line for the child's age is at eye level.
- Avoid pointing to and keeping the pointer by the optotype.
- Standard measurement for distance screening is 10 feet.



When seated, measure 10 feet to back of the chair.



When standing, measure 10 feet to arch of the foot.

- Standard measurement for near vision screening is 16 inches:
 - o Between the student's temple and the vision chart
- The student's age and understanding are considered when preparing for screening:
 - For young students, explain the task as playing a game with pictures, rather than testing with optotypes.
 - Review the shapes, pictures, or letters with the student before beginning.
 - Students may identify a circle as a ball or a box as a square, and this is appropriate and acceptable.
 - Some kits come with a lap card that the student may point at to show the matching optotype.
 - As the student grows in maturity and understanding, the task can be referred to as identifying how well they see rather than the negative connotation of testing for deficiencies.
- Occluders are age-dependent:
 - Anyone can use a patch or tape.
 - o Frosted glasses are for students 3-10 years.
 - o "Lollipop" and "Mardi Gras" masks for students 10 and older.



Distance Visual Acuity Screening

With LEA SYMBOLS®, Sloan Letters, or HOTV Charts

- Occlude the student's LEFT eye.
- For critical line screening:
 - Flip the site line chart to the RIGHT eye card or point to the referral line according to the student's age, then quickly remove the pointer.
 - Ask the student to identify each optotype.
 - Record as pass or refer.
- For threshold screening:
 - Starting at the top line, on the RIGHT side of the chart, ask the student to identify the first optotype on the RIGHT side of the chart until the optotype is missed.
 - When a student misidentifies an optotype, return to the line above the missed optotype and ask the student to identify each optotype on that line from LEFT to RIGHT.
 - Continue moving down the chart, identifying each optotype until the student misses 4 or more optotypes.
 - The smallest line of optotypes where at least 3 were identified correctly is the visual acuity for that eye.
 - Record as visual acuity (e.g., L eye 20/32. Acuity values are written separately for each eye.).
- Repeat for RIGHT eye.

Near Visual Acuity Screening

With LEA SYMBOLS®, Sloan Letters, or HOTV Charts

- Occlude the student's LEFT eye.
 - Starting at the top line, on the RIGHT side of the chart, ask the student to identify the first optotype on the RIGHT side of the chart until the optotype is missed.
 - When a student misidentifies an optotype, return to the line above the missed optotype and ask the student to identify each optotype on that line from LEFT to RIGHT.
 - Continue moving down the chart, identifying each optotype until the student misses 4 or more optotypes.
 - The smallest line of optotypes where at least 3 were identified correctly is the visual acuity for that eye.
 - Record as visual acuity (e.g., L eye 20/32. Acuity values are written separately for each eye.).
- Repeat for RIGHT eye. 3, 13, 15



Computer-Based Screening

This method is permissible in Maine for distance visual acuity for all ages of students.³ GLD-Vision[®] is a computerized vision screening tool. Follow the manufacturer's instructions, which can be accessed through the following link:

GLD-Vision®

Instrument-Based Screening

This method of screening does not provide visual acuity information but provides estimates of eye misalignments or refractive errors. Instrument-based screening may be used in place of visual acuity screening with children aged 3, 4, and 5 years, and children of any age that are unable to participate in optotype-based screening.^{3, 15} Refer to the manufacturer's instructions for the procedure.

The following list of approved instruments could change as additional research emerges:

National Center for Children's Vision and Eye Health. Vision Screening Guidelines by Age: Instrument-Based Vision Screening Guidelines for Children Ages Less than 6 Years





Referral and Follow-up

In Maine, the school nurse will repeat optotype-based screening for any student who does not pass initial screening, regardless of who performs the initial screening, before a referral is made.³ Any student may be rescreened if the school nurse suspects the student could perform better on another day.²³ Students who do not pass observations or vision rescreening must be directed to an eyecare provider for a professional eye exam.³ A systematic process should be in place for tracking students who are referred for follow-up purposes and for meeting state reporting requirements. Electronic Health Record (EHR) systems can streamline student referral data. For SAUs that do not have access to EHR systems, paper documentation is acceptable. A sample referral tracking form as well as a sample parent letter with an eye doctor referral can be found on the resource page within this document.

According to the 12 Components of a Strong Vision Health System of Care, it is best practice to provide both written and verbal results to parents/caregivers, considering cultural and literacy needs. Follow-up includes educating families, removing potential barriers, and care coordination with an eyecare provider if needed. The resource page within this document contains multiple educational materials. Another option is to visit the National Association of School Nurses: Vision and Eye Health, or find the National Center for Children's Vision and Eye Health: Parent/Caregiver Resources. The school nurse will follow up with students who were referred to determine the outcome of the comprehensive eye exam. If the referral results in a need for prescription eyeglasses, the school nurse can connect families in need with support within the community.





Resources

The following information to share with parents can be found in the toolkit for parents at NCCVEH National Center for Children's Vision and Eye Health: Parent/Caregiver Resources.

- Did you know? English or Spanish
- What is the Difference Between Vision Screening and Eye Examination?
 English or Spanish
- Importance of an Eye Examination After Receiving a Referral from a Vision Screening <u>English</u> or <u>Spanish</u>
- Association Between Vision and Learning English or Spanish
- 10 Small Steps from Vision Screening to the Eye Exam and Possible Treatment for Big Vision English or Spanish
- How to Schedule an Eye Examination in English or Spanish
- Financial Assistance Information in English or Spanish
- Signs of Possible Vision Problems in Children: For Parents and Teachers
 English or Spanish
- Think of Vision: A Guide for Teachers of School-Aged Children English or Spanish
- Think of Vision: A Guide for Preschool Teachers English or Spanish
- Ten Take-Home Messages: Small Steps for Big Vision English or Spanish

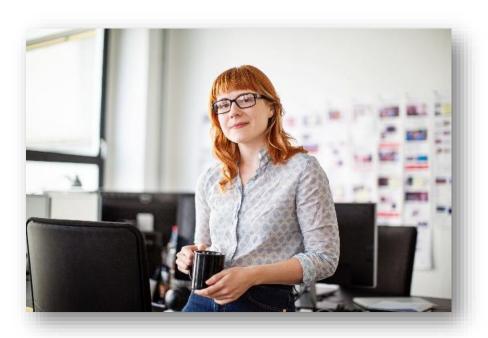
Referral for an Eye Examination letter with release of information: English or Spanish

Vision Screening Worksheet

Professional organizations such as the Maine Lions Club may be utilized when appropriate to assist with screenings in accordance with Chapter 45.

VSP Eyes of Hope has a gift certificate program that can help families in financial need.

NIH: Get Free or Low-Cost Eye Care





Definitions

Binocular Vision: The brain's ability to combine the images from each eye into a single, three-dimensional object. Problems in binocular vision ability can include double vision, blurred vision, problems with depth perception, headaches, or loss of visual efficiency and comprehension.

Color Vision: Perception of color, results from stimulation of the cone system of the eye. The cones are our most precise light receptors, able to distinguish fine detail and colors, but require bright light to function effectively.

Cones: The highly specialized conical or flask-shaped outer segments of the visual cells; together with the retinal rods, they form the light-sensitive elements of the retina. Also called cone cells, visual cones, and retinal cones.

Conjunctivitis (Pink Eye): Pathological condition. Inflammation of the conjunctiva (membrane that covers the white of the eye and inner surfaces of the eyelids) characterized by discharge, grittiness, redness, and swelling. Can be contagious.

Cornea: The transparent, blood-free tissue covering the central front of the eye where initial refraction, or bending, of light rays occurs as light enters the eye. Contact lenses are fitted over the cornea.

Critical Line Screening: The "critical line" is an age-dependent line on which a student should correctly identify 3 or more optotypes according to that student's age. Critical line screening uses only the age-dependent line.

Distance Vision: Distance vision means the ability to adequately see objects at a distance. Screening for distance vision is intended to identify students with myopia, a refractive error in which light rays converge before they reach the retina.

Eye Care Specialist (Provider): An eye care specialist (provider) is a health care provider specializing in diagnosing and treating vision problems and/or diseases of the eye. Eye care providers include optometrists, ophthalmologists, pediatric optometrists, and pediatric ophthalmologists.



Full Threshold Screening: Full threshold screening begins by asking the student to identify the first optotype at the top of the chart and the first optotype on each line until an optotype is misidentified. The screener moves up a line and asks the student to identify each optotype on that line and continues down the chart using each optotype on each line until a student misses 3 or more optotypes. The last line the student correctly identified 3 or more optotypes is the visual acuity value for that eye. Full threshold screening permits the screener to identify a minimum 2-line difference between the eyes.

Instrument-Based Screening: Using evidence-based instruments to screen for amblyopia risk factors and reduced vision risk factors and provide estimates of refractive error and estimates of eye misalignment; or screen for direct detection of amblyopia, depending on the instrument. Instrument-based screening does not measure visual acuity and instrument-based screening results may not be converted to visual acuity values. Until sufficient research exists to support the screening of older students, instrument-based screening should not be conducted with students ages 6 years and older.

Myopia: (Nearsighted): Near objects are seen clearly and distant objects are blurry. The eye at rest focuses light rays in front of, rather than on, the retina. Myopia is caused by the eyeball being too long.

Near Vision: Near vision means the ability to adequately see objects near, such as when reading. Screening for near vision is intended to identify students with hyperopia, a refractive error in which light rays have not converged before reaching the retina.

Occluder: Used to cover the eye during distance and near visual acuity screening, unless conducting binocular critical line near screening. Occluders for students ages 3 to 10 years may be adhesive eye patches, 2-inch-wide hypoallergenic surgical tape, or occluder glasses. Occluders for students ages 10 years and older can be adhesive eye patches, 2-inch-wide hypoallergenic surgical tape, or paddles to cover one eye at a time or a mask that covers one eye with an open hole for the other eye. Hands, tissues, paper paddles, or paper and plastic cups are not permitted.



Optotypes: An optotype is the name for the symbol, letter, or number on an eye chart or computer program the student is to identify.

Optotype-Based Screening: Using evidence-based eye charts or computer software programs to screen for visual acuity using full threshold or critical line formats.

Parent: Parent means a natural or adoptive parent, a guardian, or a person acting as a parent of a student with legal responsibility for the student's welfare.

Preschool screening: A health screening that occurs within the first 30 days of the start of school that includes hearing screening and vision screening.

Referral: Referral means the submission of a written form from the school directing the parent to take their student to a health care provider (which includes ophthalmologists and optometrists) for an evaluation of the potential health problem.

Refractive Error: The eye's inability to focus images clearly on the retina, typically due to either an inability of the lens to focus (accommodate), a distortion (astigmatism), or an abnormal distance (either too long or too short) from the cornea to the retina. (See Anisometropia, Astigmatism, Hyperopia, and Myopia.)

School Nurse: School nurse means a registered professional nurse with Maine Department of Education certification for school nursing.

Screening: Screening means a process of identifying students with a possible vision or eye health disorder to facilitate early intervention or treatment. Vision screening is neither diagnostic nor does vision screening replace a professional eye examination.

Treatment: Treatment by an eye care provider may include glasses and ongoing, follow-up care. Treatment may also mean monitoring the student over time with ongoing, follow-up care. If an eye care provider monitors a student without giving glasses, the referral remains appropriate.

Untestable: Students who cannot be screened because they are uncooperative or cannot complete vision screening.



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