

KANSAS VISION SCREENING REQUIREMENTS & GUIDELINES



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Kansas Department of Health and Environment
Bureau of Family Health
1000 SW Jackson, Suite 220
Topeka, KS 66612-1274
785-291-3368 or 800-332-6262



Kansas State Department of Education
900 SW Jackson, Suite 620
Topeka, KS 66612
785-296-7454 or 800-203-9462

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Primary authors:

P. Kay Nottingham Chaplin, EdD

National Center for Children's Vision and Eye Health at Prevent Blindness

School Health Corporation

The Good-Lite Company

Kira Baldonado, BA

National Center for Children's Vision and Eye Health at Prevent Blindness

Contributing authors:

Mae Claxton, ADN, RN

Retired Health Center Supervisor, Kansas State School for the Blind

Cindy Galemore, MEd, BSN, RN, NCSN, FNASN

Consultant to KDHE, Bureau of Health Promotion, Healthy Kansas Schools

Grant; Professional Standards Chair, Kansas School Nurses Organization

Misty Goosen, EdS

Kansas Inservice Training System, Kansas University Center on

Developmental Disabilities

Graecinda M. K. Tedder, MEd, BSN, BSE, RN

Early Childhood Special Education School Nurse, Olathe Public Schools;

Member at Large, Kansas School Nurses Organization; and Grand Canyon

University Doctoral EdD Student

Additional members of the reviewing committee:

Jennifer Brantley, PhD

Stacy Clark, OD

Joan Houghton, EdD

Kendall Krug, OD

Linda Lawrence, MD

Anne Nielsen, PhD

Joseph Sullivan, OD

Heather Smith, MPH

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Introduction

Vision in young children represents a profound intersection between early development and learning success. Overall, research has repeatedly shown that healthy sight plays a role in reducing poverty, improving reading readiness, increased graduation rates, attainment of developmental milestones, and positive social relationships (Atkinson et al., 2002; Basch, 2011; Davidson & Quinn, 2011; Maples, 2003; VIP-HIP Study Group, 2016; Wen et al., 2011). Unfortunately, children and their parents/caregivers may be unaware of reduced visual functioning; thus, routine vision screening and follow-up eye examinations, when necessary, are vitally important to detect problems before the child's development (and potentially their future) is compromised.

Vision problems can begin well before a child attends school. Vision impairments caused by refractive error, amblyopia, strabismus, and/or astigmatism are common conditions among young children, affecting 1 to 6% of all children younger than 5 years old. Amblyopia is present in 1 to 4 % of preschool-aged children and an estimated 4% of these children have myopia and 20% have hyperopia (U.S. Preventive Services Task Force [USPSTF], 2017). A recent study has projected that the prevalence of vision problems in preschool-aged children will increase 26% by the year 2060, with a majority of the prevalence (69%) being due to visual impairment from uncorrected refractive error (Varma, Tarczy-Hornoch, & Jiang, 2017). Varma et al. also suggests minority children will be disproportionately impacted, with Hispanic white children accounting for the largest number and proportion of cases, followed by African American children.

Early detection and intervention for vision problems are incorporated into national goals and health care standards. The USPSTF recommends vision screening at least once between the ages of 3 and 5 years (2017). National pediatric preventive care guidelines include vision assessment guidelines for children younger than age 3 years and promotes vision screening by pediatricians yearly at ages 3 through 6 years, and then at regular intervals through late adolescence (Bright Futures/American Academy of Pediatrics, 2017; Hagan, Shaw, & Duncan, 2017). Finally, a report from the National Academies of Science, Engineering, and Medicine promotes a comprehensive public health approach to vision, one that incorporates evidence-based vision screening procedures along with access to comprehensive eye care for those who fail a vision screening (2016).

While vision screenings and eye examinations are complementary approaches to assessing the eye problems of a child, a screening is used to identify a child at risk for vision problems and does not replace a comprehensive examination performed by an eye care professional. **Eye care professionals include optometrists, pediatric optometrists, ophthalmologists, and pediatric ophthalmologists.** Additionally, vision screenings provide a critical bridge from detection to eye care for families that may not regularly access health or eye care services, may need financial assistance to afford care, or those that may not fully understand the impact an undiagnosed and untreated vision problem might have on the rest of their child's life.

Vision screening and eye health should be an integral part of the coordinated school health program. The goal of the screening program for school-aged children shifts from

a primary focus on prevention of amblyopia and detection of amblyopia risk factors, as is the primary target in very young children, to detection of refractive errors and other eye conditions that could potentially impact the students' ability to learn or to affect their academic performance. Vision screening using recommended tools, protocols, and procedures is a cost-effective method to identify children in need of evaluation and treatment by an eye care professional. When properly implemented, a system of vision health for students includes screenings in infancy, early childhood, and school-age years to facilitate early identification of vision impairment and the initiation of intervention services.

The final but most important aspect of the vision health system is follow-up intervention. The child who does not pass vision screening should receive an examination by an eye care professional. If the children referred do not receive professional attention, the vision screening program has not accomplished its mission.

The overarching goal of these guidelines is the ongoing promotion of an evidence-based vision screening and eye health program for Kansas infants, children, and youth – a program that includes early detection, referral, communication with parents and caregivers, follow-up eye examinations and interventions, adhering to treatment plans, collaboration among stakeholders, documentation, and program evaluation. In addition, the guidelines provide instruction and discussion regarding state required and national recommendations. The guidelines are meant for all children from birth through age 21 years in both public and private health programs including Part C Infant-Toddler Service (ITS) screening and school screening.

The objectives of the Kansas vision screening program are to:

- provide uniform screening guidelines, referral criteria, and resources throughout Kansas,
- assist with early detection and identification of suspected vision disorders in children with appropriate referral for diagnosis,
- provide follow-up guidance for all referrals,
- encourage maintenance of visual screening records of all infants, toddlers, children, and young adults,
- promote collaboration with community providers for intervention and treatment of identified visual concerns, and
- encourage education on vision health and vision-related impairment for children, families, educational staff, childcare providers, and community members.

The **6th Edition** of the ***Kansas Vision Screening Requirements and Guidelines*** presents a new format for users. This revised edition, with its comprehensive approach, separates screening information not only by age of the student being screened, but also by special needs. Groupings are presented in the following order:

- Infants and Children with Special Considerations.
- Birth to Age 3 Years.
- Early Childhood - Ages 3, 4, and 5 Years.
- Ages 6 Years and Older.

Unlike past editions, all required and recommended tests are presented within each grouping resulting in instructions for some screening assessments being repeated throughout the guidelines. Chapters 1 and 2, as well as the appendices, provide legal and general information, along with various charts, forms, and letters, to guide vision screening in schools throughout our state.

Chapter 1

Legal Requirements by Program

Kansas Infant and Toddler Program – Part C

The Individuals with Disabilities Education Act (IDEA, 2004) is a federal law authorizing funding and oversight to states in the provision of Early Intervention (EI) services to infants/toddlers with developmental delays from birth to 35-months (Part C), and special education and related services to children/youth with disabilities ages 3-21 years old (Part B). In Kansas, Part C of IDEA is administered by the Kansas Department of Health and Environment; Kansas Infant-Toddler Services (KS ITS), and Part B of IDEA is administered by the Kansas State Department of Education (KSDE), (2017a). The focus of EI services under Part C is to enhance the development of infants and toddlers with developmental delays and increase the capacity of families to meet their child's individual needs, whereas Part B centers on providing special education and related services that are necessary for school age children (3-21 years) with disabilities to receive a free and appropriate education (FAPE).

As part of the initial eligibility evaluation under Part C, a vision screening must be completed. The purpose of this screening is to rule out the possibility that problems in vision may be negatively impacting development. However, vision screening conducted as a part of the initial evaluation is not diagnostic.

Kansas Department of Health and Environment Permanent Administrative Regulations Infant and Toddler Program: 28-4 550. Definitions

(r) "Screening" means a brief procedure administered by qualified personnel to identify a child who needs an evaluation. The five developmental domains to screen are the following:

- (1) Cognitive development.
- (2) Physical development, including health and nutrition, motor, **vision**, and hearing.
- (3) Communication development.
- (4) Social or emotional development.
- (5) Adaptive development.

Written, signed parental consent is required for Infant-Toddler Part C screenings (K.A.R. 28-4 551 (e)), however when parents provide written consent to evaluate a child to determine Part C eligibility, they are indicating consent for the complete evaluation which includes screening for nutrition, hearing, and **vision**. A separate consent for vision screening is not necessary. In cases where screening results indicate that the infant/toddler is at risk for vision problems, a referral must be made to appropriate medical professionals (qualified physician, ophthalmologist, or optometrist) who will then conduct a formal vision evaluation. Procuring a professional examination for the

infant/toddler found to be at risk at the conclusion of the vision screening is the responsibility of the parent(s) or lawful custodian. EI staff must follow up on every vision screening referral to identify if barriers exist to accessing a professional examination as well as potential vision services if needed.

Information gathered during the medical vision evaluation is used in conjunction with other developmental assessment information to establish Part C eligibility, determine a need for vision services, and establish interventions that might be included as part of the Individual Family Service Plan (IFSP). The IFSP is a formal document that is developed in collaboration with the family and describes the specific services that will be carried out over the next 12 months to support the development of the child as well as build the capacity of the family to meet their child's unique needs. Each year a vision screening (or evaluation by an eye care professional) must be completed as part of the annual IFSP process. IDEA requires that the IFSP includes a statement of the child's present level of physical development including vision, hearing, and health status (CFR 303.344). In the case of infants/toddlers who are being followed for vision care, it is the expectation that the EI Family Service Coordinator will, with parental permission, obtain records and correspond with the vision service provider to assist the family in meeting any needs related to vision.

As stated previously, the Part C system is administered by the Kansas Department of Health and Environment; Kansas Infant-Toddler Services (KS ITS). At the local level, Part C services are provided by networks referred to as *tiny-k* programs. Services are designed to maximize a family's ability to promote the overall development of their child with special needs and are carried out with the support of early intervention (EI) staff utilizing the Primary Service Provider (PSP) approach. These services are provided in the home or other natural environment identified by the family. The following steps are taken to determine eligibility and access Part C services:

1. A referral is made to the *tiny-k* program indicating that the infant/toddler may be experiencing a developmental delay or disability. Primary referral sources include, but are not limited to parents, hospitals, physicians, and child care programs.
2. Once a referral is made the *tiny-k* program must obtain written parental consent, provide the family information regarding parental rights (due process), and answer any questions the parents might have about Part C services and how services are carried out in the local *tiny-k* program.
3. The *tiny-k* program, in partnership with the family, must complete the initial evaluation, determine eligibility, and develop an IFSP (for eligible infants/toddlers) within 45 calendar days from the date of the initial referral.

Qualifications and Training of Vision Screeners

IDEA requires that evaluation and assessment procedures (including vision screening) are provided at no cost to the parents and are to be conducted by qualified personnel.

[[34 CFR 303.321 (a) (2) (i)]; {34 CFR 303.321}]. In Kansas Part C, qualified personnel may include nurses, volunteers, or others instructed in the administration of the of *the Kansas tiny-k Vision Screening Record* (Refer to Chapter 4 and Appendix D, Document 1). KSITS assumes the responsibility for coordination of in-service education, training, and periodic updating of information and skills for those conducting vision screening in *tiny-k* programs.

Currently in Kansas, vision screening training is available through the Area Health Education Centers (AHEC) as well as some professional health conferences. For training dates contact:

University of Kansas Medical Center
Area Health Education Center
1501 S. Joplin
4th Floor, Shirk Hall
Pittsburg, KS 66762-0296
Telephone: (620) 235-4040
Email: ahecpitt@kumc.edu
Website: <http://www.kumc.edu/community-engagement/ku-ahec.html>

Collaboration of Systems

Part C of IDEA describes the need for an interagency approach to early intervention services, encouraging organizations and programs at the state and local level to enter into formal and informal agreements. Such agreements reflect a spirit of cooperation and collaboration to ensure that families have access to all services that may positively impact infants/toddlers with developmental delays. *Tiny-k* programs are encouraged to work closely with community programs and others engaged in vision screening and/or vision services to coordinate, collaborate, and share information, with parental permission, in order to avoid duplication and expedite services. For example, children enrolled in Medicaid should receive both vision and hearing screenings at each well-child check-up as part of the Early Periodic Screening, Diagnostic, and Treatment (EPSDT) referred to in Kansas as KAN Be Healthy, according to a provided schedule (Bright Futures/American Academy of Pediatrics, 2017).

Part C early intervention services are available to eligible infants/toddlers until their 3rd birthday. Prior to the 3rd birthday, a transition team (including the parents) is identified to develop a transition plan describing steps for exiting early intervention and determining eligibility for Part B school district services. This plan must be developed not fewer than 90 days, and at the discretion of all parties, not more than nine months [34 CFR 303.209]. Creating a transition plan helps ensure that there are no gaps in services between the two programs. During the transition, and with written parental permission, school district staff will review Part C records and gather additional evaluation information as necessary to determine if the child is eligible for Part B services.

Vision screening information is updated and recorded annually on the IFSP. As part of the record review conducted by school district staff, depending on the initiation date of the most frequent IFSP, vision screening information conducted previously by Part C may be useful in the eligibility process for Part B school district services.

Tiny-k programs should focus efforts in creating linkages to and supporting existing systems of care and services within each community. Local partnerships can create effective systems, thereby assuring that systems of care function more effectively. A table (Vision Education/Resources) listing a wide range of services available in our state is located in Appendix E. In addition, the importance of collaboration of systems is discussed later in this document as it relates to children and youth, ages 3 years and older. Children thrive and flourish within cooperative communities where articulated systems result from collaborative efforts.

Kansas School Screenings

Kansas legislation, concerning vision screening, was revised in 2022 and requires schools, including accredited nonpublic schools, provide basic vision screening annually to children participating in IDEA part B programs, and for students in kindergarten, grades one, two, three, five, seven and ten, as well as within the first year of admission for students in grades four, six, eight, nine, eleven, and twelve. The law further states that the performance of vision screening is to follow the most recent state vision screening guidelines. A second law addresses eye protective devices when participating in certain courses. The laws specifically read as follows:

Kansas Statutes - Chapter 72.-Schools Article 62. Student Health Vision Screening and Eye Safety

72-6241. Definitions. As used in this act*:

- (a) "Accredited nonpublic school" means all nonpublic elementary and secondary schools accredited by the state board of education;
- (b) "basic vision screening" means an age-appropriate eye testing program for each child that is implemented according to the most recent edition of the Kansas vision screening requirements and guidelines and includes referrals for eye examinations and necessary follow-ups;
- (c) "board of education" means the board of education of any school district;
- (d) "IDEA part B" means all statewide programs providing special education and related services to children with disabilities aged 3 through 5 in accordance with 20 U.S.C. § 1411, and amendments thereto;
- (e) "school district" means any school district organized under the laws of this state; and
- (f) "vision screener" means any school nurse, or the nurse's designee, or other person who is trained to administer a vision screening test to students in the state of Kansas.

History: L. 1959, ch. 310, § 1; L. 2022, ch. 50, § 6; July 1.

72-6242. Provision of basic vision screening eye examination encouraged for conditions; Kansas children's vision health and school readiness commission. (a) Basic vision screening shall be provided without charge in accordance with the following:

- (1) Annually, for every child participating in IDEA part B programs;
 - (2) at least once each school year for students enrolled in kindergarten and each of the grades one through three, five, seven and 10 in a school district or an accredited nonpublic school; and
 - (3) within the first year of admission for any student who enrolls in a school district or an accredited nonpublic school.
- (b) (1) Every student enrolled in a school district shall be provided basic vision screening by the board of education of the school district in which the student is enrolled.

(2) Every student enrolled in an accredited nonpublic school shall be provided basic vision screening by either:

(A) The accredited nonpublic school in which the student is enrolled; or

(B) upon request by the student's parent or guardian, by the board of education of the school district in which the student resides.

(c) Basic vision screenings shall be performed by a vision screener designated by the board of education or by an accredited nonpublic school. Vision screeners shall be required to follow the most recent state vision screening guidelines for performing vision screening. The results of the screening and, if necessary, the referral for an examination by an ophthalmologist or optometrist shall be reported to the parents or guardians of the student. The referral for an examination by an ophthalmologist or optometrist shall not show preference in favor of any such ophthalmologist or optometrist.

(d) Each student needing assistance in achieving mastery of basic reading, writing and mathematics skills shall be encouraged to obtain an eye examination by an optometrist or ophthalmologist to determine if the student suffers from conditions that impair the ability to read. Expense for such examination, if not reimbursed through medicaid, private insurance or any other governmental or private program, shall be the responsibility of the student's parent or guardian.

(e) A Kansas children's vision health and school readiness commission shall be established to ensure the implementation of this section. Members of the commission shall be appointed by the state board of education. The commission shall be comprised of:

(1) One optometrist;

(2) one ophthalmologist;

(3) one representative of a health organization dedicated to preventing blindness;

(4) one representative of the department of education;

(5) one representative of the department of health and environment;

(6) one school nurse;

(7) one public health nurse; and

(8) one school administrator.

(f) Members of the commission shall not be reimbursed for meeting expenses.

(g) The duties of the commission are as follows:

(1) Overseeing revision of state vision screening requirements and guidelines no fewer than once every seven years;

(2) providing standardized vision screening referral letters and eye professional examination reports as referenced in the Kansas vision screening requirements and guidelines;

(3) identifying state resources that assist in providing opportunities to offer free or low-cost eye exams for students who fail vision screenings and are unable to afford an examination on their own; and

(4) establishing a system to collect data from school health personnel concerning the results of the original screenings and referral outcomes, as well as issuing an annual report to the secretary of health and environment and the commissioner of education.

History: L. 1959, ch. 310, § 2; L. 2001, ch. 215, § 15; L. 2022, ch. 50, § 7; July 1

72-6281. Eye protective devices required when participating in certain courses. Every student and teacher in all schools, colleges, and universities or other educational institutions participating in any of the following courses:

(A) Vocational, technical or industrial arts shops or laboratories involving experience with:

1. Hot molten metals, or other molten materials;

2. Milling, sawing, turning, shaping, cutting, grinding, or stamping of any solid materials;

3. Heat treatment, tempering, or kiln firing of any metal or other materials;

4. Gas or electric arc welding, or other forms of welding processes;

5. Repair or servicing of any vehicle;

6. Caustic or explosive materials;

(B) Chemical or combined chemical-physical laboratories involving caustic or explosive chemicals or hot liquids or solids, or injurious radiations, or other hazards not enumerated; is required to wear appropriate industrial quality eye protective devices at all times while participating in such courses or laboratories. Such devices may be furnished for all students and

teachers, and shall be furnished for all visitors to such classrooms and laboratories. Such devices may be purchased in large quantities and sold at cost to students and teachers.

"Industrial quality eye protective devices," as used in this section, means devices meeting the standards of the United States of America standard practice for occupational and educational eye and face protection, Z87. 1-1968, promulgated by the American national standards institute, inc.

The provisions of this section shall apply to industrial quality eye protective devices purchased or otherwise obtained for use after the effective date of this act, and shall not have retroactive application to disqualify any such device in use on or before the effective date of this act.

History: L. 1967, ch. 408, § 1; L. 1978, ch. 290, § 1; July 1.

Qualifications and Training of Vision Screeners

Vision screeners, when conducting vision screening, screen for risk factors and reasons to refer individuals to eye care professionals. Vision screening is ***not diagnostic*** and does not replace a comprehensive eye examination conducted by an eye care professional trained and experienced with working with children. Thus, it is important for vision screeners to follow guidelines, including the referral guidelines. Vision screeners

are not to try to interpret findings, but instead assist families with access to an eye care professional.

As part of professional training, the vision screener will:

- describe common vision disorders,
- demonstrate how to arrange a screening environment,
- demonstrate procedures for using recommended vision screening tools and procedures, and
- describe ways to follow up with parents when children do not pass vision screening.

Currently in Kansas, vision screening training is available through the **Area Health Education Centers (AHEC)** as well as some professional health conferences. For training dates contact:

University of Kansas Medical Center
Area Health Education Center
1501 S. Joplin
4th Floor, Shirk Hall
Pittsburg, KS 66762-0296
Telephone: (620) 235-4040
Email: ahcepitt@kumc.edu
Website: <http://www.kumc.edu/community-engagement/ku-ahec.html>

Prevent Blindness, a national non-profit organization, dedicated to preventing blindness and preserving sight, offers an online vision screening certification program for those screening preschool and school-aged children. The Prevent Blindness Children's Vision Screening Certification Course provides participants with certification

in the most current, evidence-based vision screening and eye health best practices for preschool- and school-aged children. Participants will learn:

- Common vision disorders in children,
- How to use evidence-based and age-appropriate tools for vision screening,
- How to enhance screening programs to improve follow-up to eye care for referred children,
- How to gain access to several educational resources.

The online course approach includes self-paced online modules, module assessments, instructional videos, and culminates with a person-to-person video chat to analyze the trainee's screening skills. Successful completion of the course will result in a 3-year nationally recognized certification in Children's Vision Screening provided by Prevent Blindness. For more information go to: <https://www.preventblindness.org/prevent-blindness-childrens-vision-screening-certification-course>

Ideally, a registered nurse, who has completed a vision screening training program, provides the overall supervision of the school and health department vision screening programs ensuring the implementation of:

- screening and referral criteria according to these guidelines, and
- coordinated follow-up for individual children and adolescents to access needed services.

The staff member supervising school vision screenings is responsible for ensuring volunteers and other personnel assisting with screenings are adequately trained (e.g., attended a vision screening training or certification program). Eye care professionals naturally serve as vision referral sources and are also invited to serve as screening consultation support. In some situations, referrals are coordinated through children's medical homes (e.g., insurance requires medical home referral to eye care professional). Eye care professionals provide comprehensive eye examinations using dilation drops, diagnose, and provide treatment plans, as needed.

Parent/Guardian Consent/Refusal for Vision Screening

A parent or guardian has the right to refuse vision screening for children under his/her legal custody. A written, signed statement or documentation of a verbal request from the parent/guardian indicating refusal is recommended for school screenings.

School districts are highly encouraged to inform parents of the vision screening process prior to its occurrence in the school. This information can be provided through the classroom/school newsletter, electronic communication or other media, and/or a letter to each student's family (see example in Appendix D, Document 5). Providing information about an upcoming school-screening program prior to its occurrence gives parents/guardians the opportunity to decide whether or not to allow the screening to be performed on their children. Vision screening follows an opt-out process. Unless parents indicate refusal for screening, vision screening will be conducted.

When conducting vision screening for students receiving evaluation under the Individuals with Disability Education Improvement Act (IDEA) for eligibility of potential services, regardless of age, written parental consent is required (Kansas State

Department of Education, 2011). The staff member responsible for obtaining the consent varies per school district and service provider. Staff members performing vision screening for IDEA services need to be knowledgeable about the local parental consent process. The Kansas Special Education Process Handbook is available at this link: <http://www.ksde.org/Agency/Division-of-Learning-Services/Early-Childhood-Special-Education-and-Title-Services/Special-Education/Legal-Special-Education-Law/Kansas-Special-Education-Process-Handbook>

Collaboration of Systems

Children enrolled in Medicaid should receive both vision and hearing screenings at each well-child visit as part of the Early Periodic Screening, Diagnostic, and Treatment (EPSDT). In Kansas, the Medicaid program is also referred to as KAN Be Healthy, and provides care according to the Bright Futures/American Academy of Pediatrics schedule (2017). Collaboration with local primary care providers who work with children within existing systems of health care, including those covered under Medicaid, is essential to prevent duplication and replication of health screenings and lessen fragmentation of health care. Likewise, primary care providers within systems of care need assistance with outreach and access to children of families enrolled in their programs to promote utilization of the services offered through their system of care.

School district health staff should focus efforts in creating linkages to and supporting existing systems of care and services within each community. Local partnerships can create effective systems, thereby assuring that school boards fulfill statutory screening mandates and that those systems of care function more effectively. A table (Vision Education/Resources) listing a wide range of services available in our state is located in Appendix E. In addition, the importance of collaboration of systems is discussed earlier in this document as it relates to Infant-Toddler Part C regulatory screening.

Children who are already being screened, or examined, and followed within a system of care do not need to be re-screened. However, the school system is burdened with the duty of assurance that vision screening is completed according to the law. A system for communicating vision screening results to school personnel must be mutually agreed upon by the agencies in the community serving children and adolescents within Health Insurance Portability and Accountability Act (HIPAA) compliance of those collaborating entities. All agencies must guard all individually identifiable health information as confidential and only transfer information following informed, signed permission from the parent or guardian or, in the school system, under the pact of an interagency agreement, which existence is also communicated to the parent or guardian.

Chapter 2

Principles of Vision Screening

The Importance of Vision Screening

Vision screening is not diagnostic and does not replace a comprehensive eye examination with dilation drops. The importance of vision screening includes, at least, the following four reasons.

1. Undetected and uncorrected vision disorders can impair child development, lead to behavior problems in the classroom, interfere with early literacy and learning, and lead to permanent vision loss if not detected and treated early, preferably before age 5 years (Collins, Mudie, Inns, & Repka, 2017; NASEM, 2016; Peterseim et al., 2015; Ruderman, 2016; VIP-HIP Study Group, 2016).
2. Visual functioning is a strong predictor of academic performance in school-aged children (Basch, 2011; Collins, Mudie, Inns, & Repka, 2017; Gracy et al., 2018; Maples, 2003; Harvey, Miller, Twelker, & Davis, 2016).
3. Undetected and uncorrected childhood vision disorders may continue to affect health and well-being throughout the adult years (Davidson & Quinn, 2011).
4. Early detection and treatment of vision disorders is critical (Atkinson, et al., 2002; Ibrionke, Friedman, & Repka, 2011; Roch-Levecq, Brody, Thomas, & Brown, 2008; USPSTF, 2017; Wen et al., 2011).

12 Components of a Strong Vision Health System of Care

Evidence-based vision screening is one piece of a strong vision health system of care. The National Center for Children's Vision and Eye Health (NCCVEH) at Prevent Blindness partnered with the National Association of School Nurses (NASN) to provide guidance for school nurses, and others, involved in vision screening. The partnership involved creating a webpage organized according to the 12 Components of a Strong Vision Health System of Care (NASN, 2017). Resources are provided for each component. Review the NASN/NCCVEH website for updates to the 12 Components of a Strong Vision Health System of Care (<https://www.nasn.org/nasn-resources/practice-topics/vision-health>). The 12 components are:

1. Ensuring that all parents/caregivers receive educational material, which respects cultural and literacy needs, about the importance of:
 - a. Good vision for their child now and in the future.
 - b. Scheduling *and attending* an eye examination when their child does not pass vision screening.
 - c. Educating parents/caregivers that a vision screening does not evaluate all aspects of the visual system.
2. Ensuring that parent/caregiver's written approval for vision screening includes permission to:
 - a. Share screening results with the child's eye doctor and primary care provider.
 - b. Receive eye examination results for your file.

- c. Talk with the child's eye doctor for clarification of eye examination results and prescribed treatments.
 - d. Share eye examination results with the child's primary care provider.
3. Screening vision with age-appropriate and evidence-based tools and procedures, including optotypes (pictures) and/or instruments.
 - a. Follow national referral and rescreening guidelines.
 - b. Include vision screening training for your staff that leads to certification in evidence-based vision screening procedures.
 - c. Ensure that contracted screening organizations use evidence-based tools and procedures, utilize national referral and rescreening guidelines, and clearly state that a screening does not replace an eye examination nor provide a diagnosis.
4. Creating policies for screening or direct referral for children with special health care needs.
5. Rescreening or referring children who are unable to participate in vision screening.
 - a. Research suggests that children who are unable to participate in vision screening are at least *twice as likely* to have a vision problem as children who pass vision screening (The Vision in Preschoolers Study Group, 2007).
 - b. When a same-day rescreening is not feasible, rescreening should be scheduled as soon as possible, but in no case later than 6 months (Cotter, Cyert, Miller, & Quinn, 2015). Otherwise, refer difficult-to-screen children for an eye examination.
6. Providing parents/caregivers with vision screening results in easy-to-understand language, which respects cultural and literacy needs and provides steps to take for prompt follow-up with an eye care provider.
 - a. Provide written results in native language.
 - b. Provide verbal results in native language.
7. Creating a system for following-up with parents/caregivers to help ensure that the eye examination occurs.
 - a. Identify and remove barriers to follow up to eye care, such as transportation or a lack of knowledge of what will occur during the eye examination.
 - b. Consider ways to engage parents in peer-to-peer conversations to encourage follow up to eye care and adherence to prescribed treatments.
8. Linking parents/caregivers for an eye examination with an eye doctor who specializes in the care and treatment of young children.
9. Receiving eye examination results for your files.
10. Sending a copy of eye examination results to the child's primary care provider.
11. Ensuring that the eye doctor's treatment plan is followed.
 - a. Develop a plan to assist with eye patching and/or glasses, as recommended by the eye care provider.
 - b. If family is experiencing barriers to following the treatment plan, provide support.
12. Evaluating the effectiveness of your vision health program annually.
 - a. Compare screening results to eye examination outcomes.
 - b. Identify variations in referral rates among your screeners.

- c. Monitor screening procedures to ensure they follow current recommendations.
- d. Monitor follow up to eye care for children who did not pass vision screening or who were difficult or unable to screen.
- e. Look for common barriers in follow up to eye care and create and implement solutions.

Screening Vision with Evidence-Based Tools and Procedures

{It is recommended the use of evidence-based tools and procedures as presented in this 6th Edition of the Kansas Vision Screening Requirements & Guidelines occur no later than August 1, 2020.}

Vision screening has two approaches for primary care clinical practices and school nurses – optotype-based and instrument-based. Optotype is the name of the symbol or letter a child is to identify. Instruments are devices that automatically analyze digital images of the eyes to provide immediate information about refractive error and misaligned eyes.

- Individuals conducting optotype- and instrument-based vision screening should be trained or certified to ensure uniformity across procedures.

Optotype-based screening (Nottingham Chaplin & Bradford, 2011):

- Optotype-based screening (eye charts or computer monitors that display optotypes) measures visual acuity as interpreted by the brain.
 - Visual acuity is defined as the quantifiable measurement of the sharpness or clearness of vision when identifying black optotypes on a white background using specific optotype sizes at a standardized distance.
- Optotype-based screening should be conducted with evidence-based tools.
 - The choice and arrangement of optotypes can significantly affect the visual acuity score obtained (Bailey, 2012). See Table 1.
 - Refer to Appendix B for recommended evidence-based screening tools;
 - Refer to Appendix C for tools that are **not** recommended.

Table 1 National and International Eye Chart Design Guidelines

1. Optotypes should be of approximate equal legibility.
2. Each line on an eye chart should have the same number of optotypes.
3. Horizontal spacing between optotypes should be equal to the width of the optotypes on the line.
4. Vertical spacing between lines should be the height of the optotypes in the next line down.
5. The size of the optotypes should progress geometrically up or down a chart by approximately 0.1 log units.
6. Optotypes should be black on a white background under good lighting conditions.

Source: Committee on Vision (1980), International Council of Ophthalmology (1984); World Health Organization (2003). Recommendations are to help achieve eye chart standardization.

- Optotype-based screening has two approaches:
 1. Threshold screening: Moving down a full eye chart with several lines until a child can no longer correctly identify the majority of optotypes on a line.
 - Table 1 summarizes national and international guidelines for standardized eye chart design when conducting threshold screening.
 2. Critical line screening: Using only the line that a child should pass according to the child's age. Critical line screening (Donahue et al., 2016):
 - is the age-dependent line a child is expected to pass (e.g., an 8-year-old child should be able to identify the majority of optotypes on the 20/32 line),
 - is an alternative to threshold screening for detecting children with vision problems, and can be administered more quickly than threshold screening.

Tips for ensuring eye charts for threshold screening include:

- Charts will be designated for a screening distance of 10 feet instead of 20 feet.
- Charts will include a 20/32 line instead of a 20/30 line.
- If you drew a line around the outside of optotypes, the image would appear as an inverted triangle (Figure 1) and not a rectangle (Figure 2).

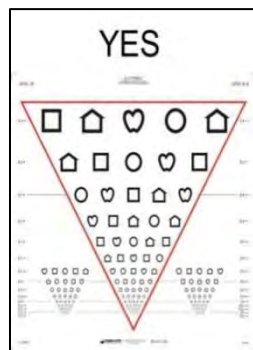


Figure 1



Figure 2

- The size of 9-inch x 14-inch charts (Figure 3) preclude using 5 optotypes per line, but meet remaining national and international eye chart design guidelines.
- Line sizes 20/50 and below must have 5 optotypes per line.
 - For children ages 3, 4, and 5 years, LEA SYMBOLS® or HOTV letters (see Figures 4 and 5) are the preferred optotypes (Cotter et al., 2015; Donahue et al., 2016).

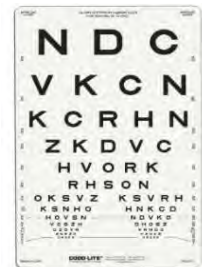
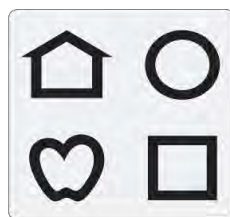


Figure 3



LEA SYMBOLS®

Figure 4



HOTV

Figure 5

- Preferred tools are for a screening distance of 5 or 10 feet.
- Preferred formats for optotypes:
 - For children ages 3, 4, and 5 years, the National Expert Panel to the National Center for Children's Vision and Eye Health at Prevent Blindness recommends critical line charts using single optotypes surrounded by four crowding bars at a 5-foot screening distance or critical line booklets with one line of 5 optotypes per page surrounded by a crowding rectangle and administered at 10 feet (Cotter et al., 2015). See Figures 6 and 7 as examples.

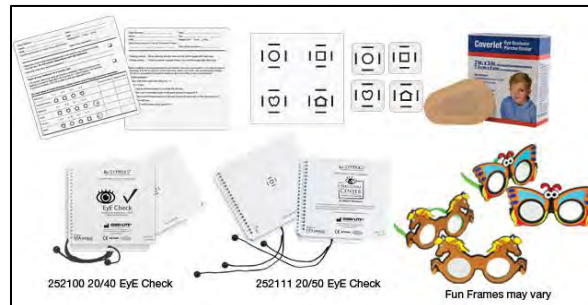


Figure 6



Figure 7

- Single optotypes **without** crowding bars (Figure 8) can overestimate visual acuity and are **not** recommended (Cotter et al., 2015; Donahue et al., 2016). However, individual cards included with charts can be placed on a tabletop in front of a child or on the floor in front of a child for matching when a child does not want to verbally identify optotypes.
- Charts with lines of optotypes for threshold screening or single, surrounded optotypes at 10 feet for critical line screening (Figures 9 and 10) are recommended in the joint statement from the American Academy of Pediatrics, American Association of Certified Orthoptists, the American Association for Pediatric Ophthalmology and Strabismus, and the American Academy of Ophthalmology (Donahue et al., 2016).



Figure 8

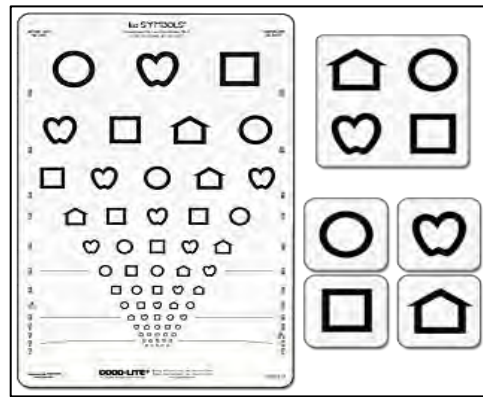


Figure 9



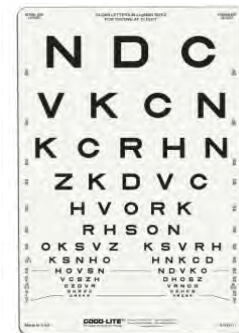
Figure 10

- For children ages 6 years and older, Sloan Letters are the preferred optotypes as shown in Figures 11 and 12 (Donahue et al., 2016; American Academy of Ophthalmology, 2017).
- Screening distance is 10 feet between the chart and the child's eyes.



Top chart is an example of a critical line chart with Sloan Letters

Figure 11



Sloan Letters

Figure 12

Screening distance between chart and child's eyes

- Whether using an optotype-based screening tool at 5 or 10 feet, the distance is between the chart and the child's eyes.
 - The age line a child should pass should be at eye level with the child (e.g., 20/32 for an 8-year-old child).
 - The child may stand during screening or sit on a chair.
 - If child stands, position the arches of the child's feet on the line 5 or 10 feet from the chart (see Figure 13).
 - If child sits in a chair, position the back of the chair 5 or 10 feet from the chart (see Figure 14) and with child sitting with his or her back against the back of the chair.



Figure 13



Figure 14

Pointing at Optotypes

Pointing at optotypes for the child to identify is **not** recommended.

- Isolating an optotype with a pointer (see Figure 15), or masking all optotypes but one on a line, can lead to under-referrals or missing children who should be referred because the optotype is easier for the child to identify (Donahue et al., 2016).
- If a child requires assistance knowing which optotype to identify, briefly point to the optotype and immediately remove the pointer.
- If using optotypes inside of crowding bars or rectangles, stay outside the box when briefly pointing (National Center for Children's Vision and Eye Health at Prevent Blindness [NCCVEH], 2017).

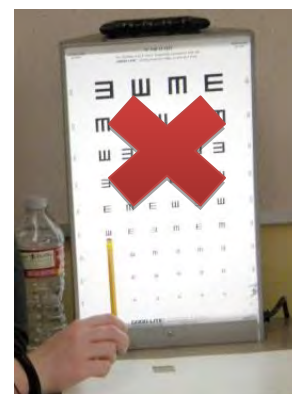


Figure 15

Recommended Room Lighting

Visual acuity screening is best performed with good illumination and maximum contrast (at least 85%) between the black optotype and the white background of an eye chart.

- Insufficient illumination of an eye chart (less than 80 cd/m² luminance) and competing light sources that create glare or uneven illumination (e.g., testing performed beside a window) can negatively affect visual acuity measurements and should be avoided (Cotter et al., 2015).
 - Room lighting should be between 80 and 160 cd/m² luminance and should be uniform between the child being screened and test of visual acuity.
 - For screeners who are unable to measure luminance, screening should occur in a well-lit environment similar to lighting in a primary care practice examination room.
 - If the lighting in a room is similar to dim outdoor lighting near dusk, or lighting is bright in parts of the room and darker in other parts of the room, the room is too dark for screening.

- Lighting should come from overhead and not from the side (e.g., avoid a lamp or window near the chart); otherwise, one side of the chart will be lighter than the other side and could affect visual acuity measurements.
- An option for appropriate, even lighting is an illuminated cabinet with LED lights (see Figure 16), which can be placed on a stand with casters or mounted onto a wall.



ESV1200

Figure 16

Approved Occluders

Children can easily peek when given responsibility for their own occlusion (e.g., using a hand to cover the eye and paper or plastic cups).

- Recommended occluders for children ages 3, 4, and 5 years (see Figure 17) include (Cotter et al., 2015):
 - adhesive patches,
 - 2-inch wide, hypoallergenic surgical tape,
 - occluder glasses, or
 - occluder glasses for smaller faces (these occluder glasses are not included in the list from the National Center for Children's Vision and Eye Health, but would be appropriate for smaller faces).



Figure 17

- Occluders **not** recommended for children ages 3, 4, and 5 years (Cotter et al., 2015):
 - hands,
 - tissues,
 - paper or plastic cups, or
 - cover paddles.
- Recommended occluders for children ages 6, 7, 8, and 9 years (see Figure 18):
 - adhesive patches,
 - 2-inch wide, hypoallergenic surgical tape, or
 - occluder glasses.

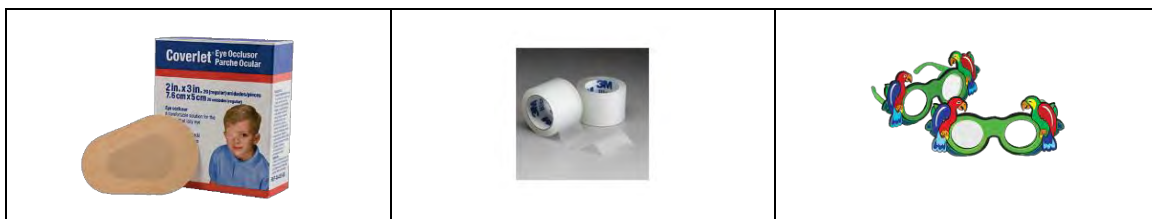


Figure 18

- Recommended occluders for children ages 10 years and older (see Figure 19):
 - “Mardi Gras” mask occlude, and
 - “Lollypop” occluders (held with handle pointing toward temple).

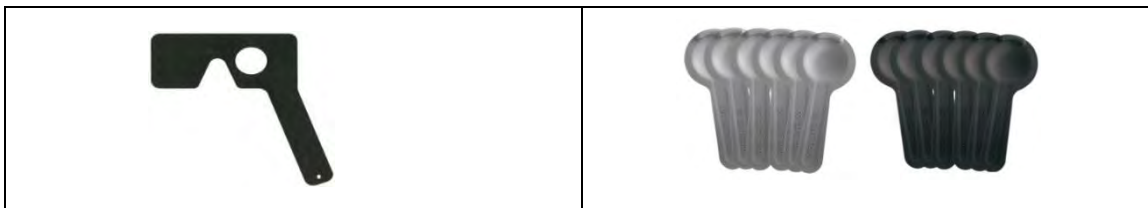


Figure 19

- Occluders **not** recommended for children of all ages:
 - hands,
 - tissues, or
 - paper/plastic cups.
- Recommendations for this age group are based on occluders included with a vision screening kit created with the American Association for Pediatric Ophthalmology and Strabismus: adhesive patches, occluder glasses, and black mask.
- Donahue et al. (2016) and the American Academy of Ophthalmology (2017) recommend adhesive eye patches and tape.

Instrument-Based Screening (Nottingham Chaplin, Baldonado, Hutchinson, & Moore, 2015):

Instrument-based screening devices can be used for children:

- At ages 1 and 2 years;
- At ages 3, 4, and 5 years as an alternative to optotype-based vision screening; and
- At ages 6 years and older **only** when children cannot participate in optotype-based screening (American Academy of Ophthalmology, 2017; Cotter et al., 2015; Donahue et al., 2016).

Instrument-based screening devices do not provide *any* information about visual acuity. Only tests of visual acuity using eye charts or optotypes displayed on a computer monitor provide information about visual acuity.

- Most of the present instrument-based screening devices produce digital images of the eyes to provide **estimates** of refractive error (hyperopia, myopia, astigmatism, and anisometropia), anisocoria (unequal pupil size), and eye misalignment.
- Certain magnitudes of refractive error are risk factors for amblyopia and certain levels are associated with reduced visual acuity.
- Either may result in a referral to an eye care professional for further assessment, diagnosis, and treatment.
- The primary purpose of conducting instrument-based vision screening with devices is to identify the presence of refractive errors that are either associated with amblyopia or typically result in reduced visual acuity that require a referral to an eye care professional.
- Instrument-based screening results **cannot, and should not**, be converted to a 20/XX visual acuity Snellen notation.

- The printed refractive error estimate is NOT a formal prescription for eyeglasses and cannot be used to produce lenses.
 - Instrument-based screening results are recorded only as pass/refer.
- Currently, four instruments are approved by the National Center for Children’s Vision and Eye Health at Prevent Blindness (NCCVEH, n.d.). Two are used in this manual.
 - Monitor this website because the list of approved instruments will likely change as additional research emerges:
<https://nationalcenter.preventblindness.org/instrument-based-vision-screening>
- Currently approved instruments include (see Figures 20 and 21):



Welch Allyn® Spot™ Vision
Screener

Figure 20



Plusoptix S12C Vision
Screener

Figure 21

Parent/Guardian Engagement and Education for Follow-Up to Eye Care

Parent/Guardian engagement and education begins with informing parents of the vision screening process prior to its occurrence in the school, along with the process for parents to follow if they wish to refuse the screening (see Chapter 1, Parent/Guardian Consent/Refusal for Vision Screening). In addition, vision screeners play an important role in ongoing parent engagement by ensuring that a child, referred to an eye care professional following a failed vision screening, is able to access that care. Various barriers (e.g., cultural beliefs about wearing glasses, lack of insurance, lack of transportation, and lack of access to eye care) often prevent parents and caregivers from following up with eye care professionals when their children do not pass vision screening. Refer to Appendix E for Vision Education/Resources.

Referral and Follow-Up

Vision screening is only the first step in detecting possible vision problems in children who require a comprehensive eye examination from an eye care professional for confirmation, diagnosis, and treatment. Vision screening is of limited value if follow-up eye examinations do not occur and treatment plans are not followed. The referral process begins with notifying parents and caregivers of the need for a professional eye examination. Depending on the size of the screener’s caseload, notification may occur through the use of phone communication, emails, and/or referral forms and letters sent home with the student.

- Refer to Appendix D for sample referral letters including the *Kansas Vision Screening Referral and Eye Care Professional Report* and the *Eye Care Professional Referral Follow-Up* form.

- Obtaining and paying for a comprehensive eye examination, treatment, and ongoing eye care is the responsibility of the parent/guardian.
- In the event a parent/guardian waives vision screening, retain a signed and dated written statement in the child's health record.
- Vision screening personnel, with administrative support, are responsible for following up on referrals to assist with barriers to care and to encourage follow-up eye care.
- If a child requires eye care and the parent/guardian is unable to obtain the needed comprehensive eye examination, the vision screening entity may apply to a court of competent jurisdiction for an order directing appropriate action.
- Completion of a vision referral for a comprehensive eye examination or determination of the parent/guardian refusal or inability to arrange and attend an eye examination should occur within 4 months after the original referral notification to the parent/guardian.
- After evaluation and treatment by an eye care professional, if visual acuity cannot be corrected to near normal, a child/student might meet criteria for referral to Part B special education in a public school system or Part C Infant-Toddler developmental evaluation.
 - Special assistance in either of these settings, with appropriate accommodations for the child's learning, may be warranted. Currently, the KSDE, provides the following criteria for blindness/visual impairment (2017b, p. 32):

For meeting this prong of eligibility, the team must consider information and have data to support at least 1 indicator from each of the following numbered categories:

1. Records contain information which provides evidence of blindness/visual impairment.
 - Measures of blindness indicate the following:
 - a visual impairment that requires dependence on tactile and auditory media for learning
 - a chronic condition exists which interferes with the visual learning mode
 - ocular motor deficit (e.g., muscle imbalance)
 - any other vision condition that, even with correction, adversely affects a child's educational performance
 - Measures of visual Impairment indicate the following:
 - a chronic or progressive condition exists which interferes with the visual learning mode
 - ocular motor deficit (e.g., muscle imbalance)
 - anophthalmus (absence of actual eyeball in one eye)
 - any other vision condition that, even with correction, adversely affects a child's educational performance
2. Measures, record review, interviews, observations, and/or tests show that the child's impairment adversely impacts his/her educational performance.
 - Information from multiple sources of data indicates that the child exhibits a visual impairment, whether permanent, fluctuating or progressive, that adversely affects his/her educational performance.
 - Evidence of any other vision condition that results in impairment that, even with correction, adversely affects a child's educational performance

For the most current version of this document, refer to the Special Education Resources page at <http://www.ksde.org>

- Additional guidance, with definitions of blindness and impairment, is available from the American Optometric Association (AOA). It is rare for someone to be totally without sight. Instead, visual impairments exist in varying degrees, and visual acuity alone is not a good predictor of a person's vision problems. Advancements in rehabilitation services and equipment have greatly improved quality of life for individuals with low vision (National Eye Institute, 2016).
 - In the United States, legally blind is defined as any person with vision that cannot be corrected to better than 20/200 in the better eye, or who has 20 degrees or less of visual field remaining (AOA, 2018).
 - Additionally, classification of visual impairment based on visual acuity and light perception include the following (AOA, 2018):
 - When the vision in the better eye with best possible glasses correction is:
 - 20/30 to 20/60, this is considered mild vision loss, or near-normal vision.
 - 20/70 to 20/160, this is considered moderate visual impairment, or moderate low vision.
 - 20/200 to 20/400, this is considered severe visual impairment, or severe low vision.
 - 20/500 to 20/1,000, this is considered profound visual impairment, or profound low vision.
 - less than 20/1,000, this is considered near-total visual impairment, or near-total blindness.
 - no light perception, this is considered total visual impairment, or total blindness.

Infection Control

Sanitation practices are an important part of the vision screening procedures. Be sure to take appropriate measures to minimize the spread of infection and disease. Suggested steps for infection control include:

- Wash hands with soap and water before beginning screening.
 - Antimicrobial hand gel may also be used.
- Use a low-PH germicidal, quaternary ammonia chloride-based cleaner for general equipment cleaning (e.g., Sani-Cloth®).
 - This type of cleaner is a broad-level disinfectant with disinfectant ability against bacteria, fungi, and viruses.
- Occluders should be disinfected after contact with each child.
- Cleaning the Stereoacuity Polarized Glasses:
 - Avoid touching the lenses.
 - Wipe lenses with a soft, dry cloth.
 - Clean the stems and frames in the between uses with antibacterial wipes.
- Cleaning devices for instrument-based devices:
 - Follow manufacture recommendations.
- Children whose eyes are red or draining should not be screened until clear.

Chapter 3

Infants and Children with Special Considerations

Children Who Are Unable to be Screened

Children who are unable or refuse to participate in the vision screening **are to be referred** for a comprehensive eye examination conducted by an eye care professional (e.g., optometrist or ophthalmologist). These children are more likely to have vision problems than testable children. The same individuals who are difficult to screen may be difficult to examine when referred for professional eye care. Screeners may need to assist the parents in locating an eye care professional who has experience examining difficult-to-screen students. Once the child is under the care of an eye care professional, parents or caregivers should be encouraged to continue periodic comprehensive eye examinations per the eye care professional's recommended schedule.

Infants and Children at High Risk of Vision and Eye Disorders

Many conditions interfere with normal visual development. The most common conditions are described in the paragraphs below. Children diagnosed with these conditions should **not** be screened. Instead, a relationship with an eye care professional should be established and schedule of periodic eye examinations maintained as set by the eye care professional.

Genetic Syndromes

Some vision problems are part of a group of conditions (syndrome). Some syndromes, such as Marfan and Usher, run in the student's family. Other syndromes, such as Down syndrome, are caused by a genetic problem that occurs at the time of conception.

- **Marfan syndrome-** is a disorder that affects connective tissue in the body of varied onset. It can affect vision by causing a dislocated lens in one or both eyes (National Institutes of Health [NIH], 2018).
- **Usher syndrome-** is a disorder that causes hearing and vision loss that continues to worsen over time. This disorder causes the retina to deteriorate with night vision loss typically being the first sign followed by blind spots, tunnel vision, and sometimes cataract formation. The retina deterioration is caused by retinitis pigmentosa or retina deterioration (NIH, 2017).
- **Down syndrome-** is a chromosomal condition associated with intellectual disability, cognitive delays, characteristic facial appearance, and increased risk for development of a variety of medical conditions including vision problems. Examples include a wide range of visual acuity errors, amblyopia, strabismus, nystagmus, lid anomalies and infections, cataracts, and other various visual concerns (NIH, 2012).

Prenatal Exposures and Illnesses

Certain chemical exposures and/or medications taken during pregnancy may lead to cataracts in children. Vitamin deficiency or Fetal Alcohol Syndrome can lead to

nystagmus. Likewise, some illnesses that a mother may have while she is pregnant can cause vision problems. Examples include toxoplasmosis, rubella (e.g., German or three-day measles), cytomegalovirus, genital herpes, syphilis, and Zika.

- **Toxoplasmosis** is caused by congenital or acquired infection with a protozoan intracellular parasite called *Toxoplasma gondii*. Symptoms for congenital cases may include retinal scarring, strabismus, microphthalmia, cataract, optic atrophy, and nystagmus. Acquired cases are typically from animal feces, most often from cats (American Association for Pediatric Ophthalmology and Strabismus [AAPOS], 2016f).
- **Congenital Rubella** is a viral infection acquired by the mother during pregnancy that may cause cataracts and retinopathy (Caserta, 2015b).
- **Congenital and Perinatal Cytomegalovirus (CMV)** is a viral infection acquired prenatally or perinatally causing many symptoms including chorioretinitis or may be asymptomatic without concerns. Although hearing loss is the most common impairment in otherwise asymptomatic neonates, vision disturbances can be an eventual symptom (Caserta, 2015a).
- **Herpes Simplex Virus Type 2 (Genital)** is a common virus that can be passed from the mother to the newborn causing central nervous system and other organ threats including vision problems and corneal scarring (AAPOS, 2014).
- **Congenital Syphilis** is an infection transmitted through the placenta to the fetus that can cause optic atrophy sometimes leading to blindness (Caserta, 2015c).
- **Zika** is a virus that can be transmitted during pregnancy causing microcephaly and eye abnormalities (Levison, 2016).

Perinatal Conditions

Problems that occur around the time a baby is born can cause difficulties with vision. Some examples of perinatal problems are prematurity, low birth weight, problems that cause a baby not to get enough oxygen at birth, or being on a ventilator. Of primary concern to premature infants is the development of Retinopathy of Prematurity (ROP). ROP is defined as an abnormal development of retinal blood vessels in premature infants that can cause retina damage and blindness.

Those babies with birth weight of 1250 grams or below and birth before 31 weeks gestation are at highest risk for ROP although other risk factors include anemia, poor weight gain, blood transfusion, respiratory distress, and overall infant health. Continuous close monitoring of infants has decreased the impact of oxygen use in the development of ROP. Long-term follow-up with ophthalmology is essential to vision health outcomes for the infant with ROP (AAPOS, 2016e). Laser surgery, injections, and other treatments can be used in some infants to treat the retina and prevent retinal detachment. Sometimes the retina detaches despite these interventions, and more extensive surgery is required. ROP increases risk for:

- amblyopia,
- strabismus,
- development of visual acuity concerns,
- retinal concerns, and
- cortical visual impairment (AAPOS, 2016e).

Family History

A child's family history of vision problems assists in determining which infants, toddlers, and preschool-aged children should be automatically referred for an eye examination by an eye care professional. Typically, family is interpreted as a first-degree relative (e.g., parents and siblings). Family history of any one or more of the following warrants a referral:

- a parent wearing glasses before the age 6 years;
- a sibling wearing glasses before the age 6 years;
- amblyopia;
- congenital cataract;
- congenital glaucoma;
- retinoblastoma (a malignant intraocular tumor); and
- strabismus (American Academy of Ophthalmology, 2017; Cotter et al., 2015; Donahue et al., 2016).

Other Conditions/Illnesses

Several conditions/illnesses place children at greater risk for vision problems. As mentioned in the introduction to this section, children with these conditions/ illnesses should **not** be screened. Instead, a relationship with an eye care provider should be established and a schedule of periodic eye examinations should be maintained as set by the provider.

Some of these conditions/illnesses include:

- autism spectrum disorders;
- birth anomaly of head or face;
- cerebral palsy;
- cognitive impairments;
- developmental disabilities/delays (e.g., global speech delay);
- droopy eye lid (ptosis);
- hearing impairment;
- neurodevelopmental disabilities (e.g., hydrocephalus, nystagmus, seizures);
- parents/caregivers who believe their child has a vision-related problem; and
- systemic diseases or using medications known to cause eye disorders (e.g., diabetes, meningitis/encephalitis) (Children's Cranial Facial Association, 2011-2019; Cotter et al., 2015).

Injuries

Eye injuries can include an injury directly to the eye or eye socket, as well as severe head injuries. Such injuries place the individual at risk for retinal detachment, although retinal detachment can also be caused by high myopia, as well as other health conditions (Boyd, 2016).

- **Retinal detachment** occurs when part of the retina separates from the back of the eye and loses its source of nourishment. Blindness may develop in the area of the visual field directly related to the part of the retina that is separated. Surgery, as recommended, is performed to restore vision.

Children with Special Health Care Needs

The importance of healthy vision for children and youth with disabilities cannot be overemphasized. Some consider vision the most important sensory modality surrounding childhood development (Salt & Sargent, 2014). Children with complex or multiple disabilities have a substantially higher percentage of vision problems than the general population of students (Salt & Sargent).

Because special education and Section 504 services in Kansas often are provided by *tiny-k* programs and/or special education cooperatives, there is occasional confusion as to how vision health should be maintained. Screeners in regular education programs should not assume that students who receive special education or Section 504 services are being screened by appropriate staff members in the *tiny-k program*, cooperative, local education agency, education services center, or interlocal learning center. Communication and coordination of screenings and follow-up duties among sites in the above situations are critical to ensure that students with disabilities are not overlooked. Vision screenings conducted on children and youth with developmental disabilities, with the exception of those at high risk of eye problems discussed earlier in this chapter, should follow the same vision screening procedures and referral criteria recommended for use with their typically developing peers. Any individual whose mental and/or physical disabilities prevent them from performing standard screening tests **are to be referred** for a comprehensive eye examination conducted by an eye care professional.

Additionally, screeners can provide suggestions to teachers, parents, and other caregivers to prepare students with disabilities for an upcoming eye examination. Once the student is under the care of an eye care professional, parents or caregivers should be encouraged to continue periodic comprehensive eye examinations per the eye care professional's recommended schedule. The screener or the education team may need to provide additional follow-up services for the students with disabilities, including training programs for the wearing and care of glasses or connecting families and caregivers to low vision services for children with identified vision loss. Finally, the eye care professional may need to explain the results of an eye examination to teachers, parents, and other caregivers so that they can better plan for the developmental and educational needs of students with disabilities.

Chapter 4 Birth to Age 3 Years

Procedure Guidance

Recommended vision screening procedures for Early Intervention services under Part C are based on the following guidelines or documents:

- Struble Jr., R. D., House, R. R., Trower, J., & Lawrence, L. M. (2016). Efficacy of a vision-screening tool for birth to 3 years early intervention programs. *Journal of AAPOS*, 20(5), 431-434.
- A 2016 joint statement from the American Academy of Pediatrics, the American Association for Pediatric Ophthalmology and Strabismus, the American Academy of Ophthalmology, and the American Association of Certified Orthoptists (Donahue et al., 2016).
- A 2017 Preferred Practice Pattern paper for pediatric eye evaluations in primary care and community settings from the American Academy of Ophthalmology (American Academy of Ophthalmology, 2017).
- A 2014 guidebook from the American Academy of Pediatrics titled: *Caring for Your Baby and Young Child: Birth to Age 5* (Trubo, 2014).
- A 2018 observation paper tool – Eight Key Vision Development Milestones to Monitor from Birth to First Birthday – from the National Center for Children’s Vision and Eye Health at Prevent Blindness (NCCVEH, 2018).

Tests/Assessments

Tests/Assessments to perform for this age group if **not** doing instrument-based screening during ages 1 and 2 years:

- Family History and Medical Risk Factors.
- External Observations.
- Vision Developmental Milestones (birth to first birthday).
- Fixate (3 months and up).
- Tracking (3 months and up).
- Pupillary Reflex (6 months and up).
- Hirschberg Corneal Light Reflection (6 months and up).

Tests/Assessments if doing instrument-based screening for ages 12 months to 3 years:

- Family History and Medical Risk Factors.
- External Observations.
- Instrument-Based Screening (12 months to 36 months).

1. Family History and Medical Risk Factors

Note:

- A referral to an eye care professional with training and experience to assess infants may be based on the family and infant’s history. Many vision and eye conditions are hereditary.

Purpose:

- To check for infant/family history risk factors for vision and eye health disorders.

Screening Location:

- Examination room.

Equipment Needed:

- Kansas *tiny-k* Vision Screening Record (Appendix D, Document 1).

Procedure:

- Collect detailed family history of vision problems, including:
 - Strabismus?
 - Amblyopia?
 - Congenital cataract?
 - Congenital glaucoma?
 - Retinoblastoma?
 - Siblings wearing glasses before age 6 years?
 - Parents wore glasses before age 6 years?
- Collect answers to questions about the child regarding known medical risk factors for developing vision disorders or other risk factors, including:
 - Prematurity <32 weeks
 - Birth weight <3.3 pounds
 - Needed oxygen >4 days as a newborn
 - Birth anomaly of head or face
 - Maternal history of infection during pregnancy (e.g., CMV, genital herpes, rubella, syphilis, toxoplasmosis, Zika)
 - Down syndrome
 - Marfan syndrome
 - Hearing loss
 - Neuropsychological conditions (e.g., cerebral palsy, seizure disorder, hydrocephalus, etc.)

Pass:

- No family history or medical risk factors are checked.

Refer for comprehensive eye examination that includes dilating drops:

- One or more history or risk factors are checked.

2. External Observations

Purpose:

- To check for external abnormalities of eyes.

Screening Location:

- Examination room.

Equipment Needed:

- Kansas *tiny-k* Vision Screening Record (Appendix D, Document 1).

Procedure:

Answer the following questions:

- Cornea (outer covering of eye) is clear?
- Corneas of both eyes are the same size without appearing enlarged?
- Sclerae (white of the eyes) are clear with no redness or unusual spots?

- Irises are complete circles?
- Pupils are round and same size?
- Pupils are black with no white discoloration or cloudiness? (White pupil = urgent referral)
- Eyelids are not droopy?
- Eyelids remain open without one eyelid tending to close?
- Eyelids are free from lumps (e.g., styne)?
- Eyes and eyelids are free of watering, redness, or crusty matter?
- Eyes are free of squinting when looking at objects?
- Eyes are free of frequent blinking?
- Eyes are steady without unusual eye movements (constant movement or shaking)?

Pass:

- All answers are “yes”.

Refer for comprehensive eye examination that includes dilating drops:

- One or more answers are not “yes”.

3. Vision Developmental Milestones – birth to the first birthday

Purpose:

- To check for missed vision development milestones.

Screening Location:

- Examination room.

Equipment Needed:

- Kansas *tiny-k* Vision Screening Record (Appendix D, Document 1).
- Penlight.

Procedure:

- Verify age of infant in months. From birth to the first birthday, answer the following questions per age groupings:

Greater than 2 months of age:

- Stable eye contact when awake and alert and initiated by parent or caregiver?

Greater than 4 months of age (all of the above plus):

- Lively, social smile?
- Demonstrates awareness of hands and explore hands with mouth?
- Watches hand movements of other children and adults?
- Eyes straight and do not constantly drift, wander, or appear to be misaligned? (Eyes constantly appearing misaligned age 4 months = urgent referral.)

Greater than 7 months of age (all of the above plus):

- Goal-directed hand/arm movements?

Greater than 9 months of age, all of the above plus:

- Recognizes family and caregiver faces?
- If exposed to books at home, points to individual pictures in a book?
- If not exposed to books at home, uses thumb and first finger to pick up objects?

Pass:

- All answers are “yes” for age.

Refer for comprehensive eye examination that includes dilating drops:

- One or more answers are not “yes”.

4. Fixate – 3 Months to 3 Years

Purpose:

- To check if both eyes fixate on an object at eye level placed in front of child's nose.

Screening Location:

- Examination room.

Equipment Needed:

- Kansas *tiny-k* Vision Screening Record (Appendix D, Document 1).
- For infants less than age 4 months, the human face can be a target.
- For infants and children older than age 4 months, small, colorful toys or finger puppets; fixation cubes on a stick, etc., that do not make noise.

Procedure:

- Facing the infant at eye level, present a small toy approximately 14 to 16 inches in front of child's nose and observe the child's eyes.
- Both of the infant's eyes should be directed toward the object for at least two (2) seconds. It is acceptable to use noise at the start of the test to gain attention; however, do not provide continuous sound stimulation to keep attention.

Pass:

- Child fixes on object with both eyes for at least 2 seconds.

Rescreen Within 2 Weeks or Refer:

- Child does not fixate on object or fixates with one eye only. Eye drifting may continue at age 3 months but is a concern for immediate referral by the 5th month.

5. Eye Tracking – 3 Months to 3 Years

Purpose:

- To check movements of both eyes when following a continuously moving target to determine if both eyes work together and are symmetric when following an object.

Screening Location:

- Examination room.

Equipment Needed:

- Kansas *tiny-k* Vision Screening Record (Appendix D, Document 1)
- For infants less than age 4 months, the human face can be a target.
- For infants and children older than age 4 months, small, colorful toys or finger puppets; fixation cubes on a stick, etc., that do not make noise.

Procedure:

- Begin with baby's head staring straight ahead, gently held steady, and not moving to provide best vantage point for observing any deviation in the infant or child's eye movements. The parent or caregiver can help gently steady the infant or child's head.
- **Binocular Horizontal Tracking:**
 - Hold target 14 to 16 inches away from infant's eyes, centered in front of the infant's eyes.
 - Slowly move the target horizontally to your right until the infant's eyes are in their extreme left viewing position.

- Slowly move the target to your left, crossing midline until the eyes are in the extreme right viewing position.
- Return target to center point.
- **Binocular Vertical Tracking:**
 - Hold target 14 to 16 inches away from infant's eyes, centered in front of the infant's eyes.
 - Slowly raise the target until the infant's eyes reach the extreme up viewing position.
 - Slowly lower the target past the center point of the infant's eyes until the eyes reach the extreme down viewing position.
 - Return target to center point.

Pass:

- Eyes follow smoothly both horizontally and vertically.

Refer for comprehensive eye examination that includes dilating drops:

- Eyes do not follow in unison.
- Movements are jerky or uneven.

6. Pupillary Reflex – 6 Months to 3 Years

Purpose:

- To check for the presence or absence of the pupillary reflex to a light source.
- To assess for size, shape, and symmetry of pupils.

Screening Location:

- Examination room.

Equipment Needed:

- Kansas *tiny-k* Vision Screening Record (Appendix D, Document 1).
- Penlight.
- Distant target for child fixation.

Procedure:

- **To assess for pupillary reflex to a light source:**
 - Dim the room lights
 - Facing the child at eye level hold the penlight in “off” position directly in front of the right eye about 3” away. Direct the child’s attention to a toy/object that is stationed away from the penlight. While the penlight is off, observe the size and shape of both pupils (should be round and equal in size).
 - Turn the penlight on, shining it directly into the right eye and watch to see if the pupil size in both eyes quickly decreases in size (constricts).
 - Move the penlight away from the eyes and watch for an increase in pupil size in both eyes (dilates).
 - Repeat the three steps above for the left eye, watching to see if the pupil size in both eyes quickly constricts.
 - Shine the penlight in the right eye again and observe the pupil size. It should remain small. Repeat the swinging motion of the penlight between each eye 2 to 3 times.

Pass:

- Both pupils constrict quickly to light and are round, black, and equal in size.

Refer for comprehensive eye examination that includes dilating drops:

- Either pupil dilates when light is shined on eye.
- Either pupil remains the same in light and dark conditions.
- Either pupil reaction to light is sluggish, jerky, or asymmetrical.

7. Corneal Light Reflection (Hirschberg Test) – 6 Months to 3 Years

Purpose:

- To check for milder forms of constant strabismus.

Screening Location:

- Examination room.

Equipment Needed:

- Kansas *tiny-k* Vision Screening Record (Appendix D, Document 1).
- Penlight.
- Target for child fixation.

Procedure:

- Use normal or lower light level.
 - Minimize light sources (e.g., windows, overhead lights).
 - Ensure no other light sources reflect from infant's pupils.
- With penlight off, hold the penlight 14 to 16 inches from the infant's head.
- Hold the fixation target beneath the penlight.
- Turn on penlight and shine the penlight at the center of the infant's forehead directly above and between the infant's eyes.
- Ensure the infant is focused on the target.
- Observe the pupils and check the position of the light reflection from each eye.

Pass:

- Reflected light appears to be in a symmetrical position near the center of the pupil of each eye (see A in diagram to right).

Refer for comprehensive eye examination that includes dilating drops:

- Reflected light appears to be near the center of the pupil of one eye and displaced nasally, temporally, or vertically away from the pupil in the second eye (see B, C, and D in diagram to right).

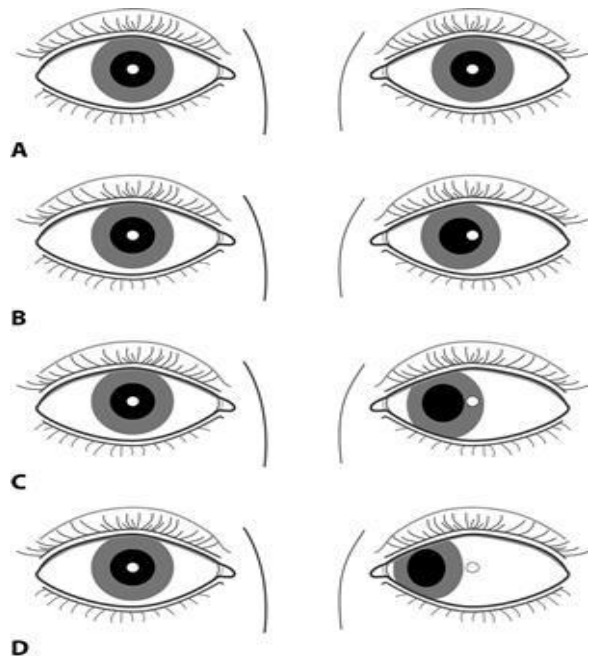


Diagram of Hirschberg Test Examples

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8. Instrument-Based Screening – 12 Months to 36 Months

Notes:

- If performing Instrument Screening on child 1 year or older, SKIP tests 4 through 7 above.
- Instruments do not provide information about visual acuity.
 - Instrument results may **not** be converted to visual acuity values (e.g., 20/20).
 - The printed refractive error estimate is **not** a formal prescription for eyeglasses and cannot be used to produce lenses.
- Hold instrument at the child's eye level; the child's head should be straight and level.
- Once instrument results are displayed, use the instrument's referral criteria.
- Instruments for this manual have been vetted by the National Center for Children's Vision and Eye Health at Prevent Blindness (National Center for Children's Vision and Eye Health, n.d.), meaning they have sufficient research to support usage with this age group.
- Monitor the NCCVEH website for updates on instruments (<https://nationalcenter.preventblindness.org/recommended-tools-and-tests>).

Tips:

- When receiving "pupils too small" message:
 - Reduce room lighting, if possible.
 - Hold a magazine or stiff 8" x 11.5" cardboard at child's forehead to reduce lighting over child's eyes.
- If the child wears glasses, screen with glasses on and lower the child's head about 1 inch to prevent instrument lights from reflecting off glasses.
- If a screener successfully captured readings on 10 or 15 students, the "wheel" on the instrument's results screen continues to spin on the 11th or 16th student, no error message appears on the screen (e.g., pupils too small), and the device times out, refer the student. Something about the eye may be preventing the instrument from receiving information from the eye (Nottingham Chaplin, Baldonado, Bradford, Cotter, & Moore, 2018).

Purpose:

- The goal of instrument-based screening is to identify amblyopia risk factors:
 - Significant refractive error (e.g., hyperopia, myopia, and astigmatism).
 - Anisometropia.
 - Eye misalignment.

Screening Location:

- Examination room or screening area.

Equipment Needed:

- Kansas *tiny-k* Vision Screening Record (Appendix D, Document 1, page 4).
- Instrument.
- Magazine or stiff 8" x 11.5" cardboard.

Procedure:

- Refer to the manufacturer instruction links provided below, as instructions could change.

- Links to instructions for two instruments are provided because the two instruments are currently approved by the National Center for Children's Vision and Eye Health at Prevent Blindness (NCCVEH, n.d.).
 - Monitor this website because the list of approved instruments could change as additional research emerges:
<https://nationalcenter.preventblindness.org/instrument-based-vision-screening>
- Currently approved instruments include:

Welch Allyn® Spot™ Vision Screener

- Instructions – Welch Allyn® Spot™ Vision Screener:

<https://www.welchallyn.com/content/dam/welchallyn/documents/sap-documents/LIT/80019/80019495LITPDF.pdf>



Plusoptix S12C Vision Screener

- Instructions – Plusoptix S12C Vision Screener:

<https://plusoptix.com/images/support-downloads/user-manual-s12c-s12r-english.pdf>



Pass:

- Instrument results will indicate if all readings are within range.

Refer for comprehensive eye examination that includes dilating drops:

- Instrument results will indicate if an eye examination is recommended.

Chapter 5 Early Childhood – Ages 3, 4, and 5 Years

Procedure Guidance

Recommended procedures for school-aged screening are based on the following guidelines or documents:

- A 2016 joint statement from the American Academy of Pediatrics, the American Association for Pediatric Ophthalmology and Strabismus, the American Academy of Ophthalmology, and the American Association of Certified Orthoptists (Donahue et al., 2016).
- A 2017 Preferred Practice Pattern paper for pediatric eye evaluations in primary care and community settings from the American Academy of Ophthalmology (American Academy of Ophthalmology, 2017).
- A 2016 paper with recommendations for screening children ages 3, 4, and 5 years from the National Expert Panel to the National Center for Children’s Vision and Eye Health at Prevent Blindness (Cotter et al., 2015).
- A 2015 position statement from Prevent Blindness on school-based vision screening and eye health programs (Prevent Blindness, 2015).

In addition to the legal requirement for distance visual acuity, the following screenings are recommended for this age group. Refer to Appendix A, Document 2 for a matrix of tool choices for vision screening procedures. School nurses should also review local district requirements.

1. ABCs of Vision
2. Distance Visual Acuity - Optotype-Based Screening
3. Optional: Near Visual Acuity – Optotype-Based Screening
4. Instrument-Based Screening
5. Stereoacuity Screening
6. Optional: Color Vision Deficiency Screening

1. ABCs of Vision

Purpose:

- To check for signs of a possible vision problem.

Screening Location:

- Well-lit room free from distractions.

Equipment Needed:

ABCs of Vision Checklist from Appendix D, Document 2.

Procedure:

- Observe student using ABCs of Vision Checklist.
- Continue to screen the student’s vision, whether or not the student exhibits any of the signs on the checklist.

Pass:

- No signs of possible vision disorders from the checklist.

Refer for comprehensive eye examination that includes dilating drops:

- Student exhibits signs of possible vision disorders from the checklist, even if the student passes vision screening.

2. Distance Visual Acuity – Optotype-Based Screening

Notes:

- Attempt optotype-based (visual acuity) screening at age 3 years. If unsuccessful or unable to screen a child, use instrument-based screening. Note: Current preference for this age is optotype-based screening. Instrument screening, if available, is acceptable as an alternative (Donahue et al., 2016).
- Review Chapter 2 for evidence-based charts, appropriate occluders, how to point correctly at optotypes if necessary, room arrangement, positioning of student, along with other principles of vision screening.
- For children ages 3, 4, and 5 years, LEA SYMBOLS® or HOTV letters (Figure 20 and 21) are the preferred optotypes (Cotter et al., 2015; Donahue et al., 2016).

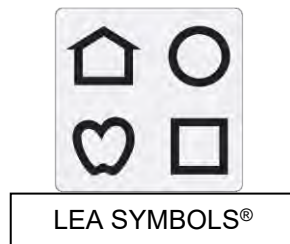


Figure 20



Figure 21

- Preferred tools are designed for a screening distance of 5 or 10 feet.
- See Appendix C for vision screening tools that are **not** recommended for this age group.

Purpose:

- To check visual acuity at distance.

Screening Location:

- Well-lit room that is free from distractions.

Equipment Needed:

- A distance visual acuity screening tool from one of the 7 options:
 - Option 1: EyeCheck Screener with LEA SYMBOLS®
 - 20/50 Flipbook for 3-Year-Old Children
 - 20/40 Flipbook for 4- and 5-Year-Old Children
 - Option 2: Sight Line Kit
 - Option 3: AAPOS Basic Vision Screening Kit – Threshold Screening chart
 - Option 4: AAPOS Basic Vision Screening Kit – Critical Line chart
 - Option 5: LEA SYMBOLS® Proportionally Spaced Chart
 - Option 6: HOTV Proportionally Spaced Chart
 - Option 7: EyeSpy 20/20™ Computerized Vision Screening
- Appropriate occluders

Procedure:

- Each of the 7 options describes how to arrange the environment and use the tool.

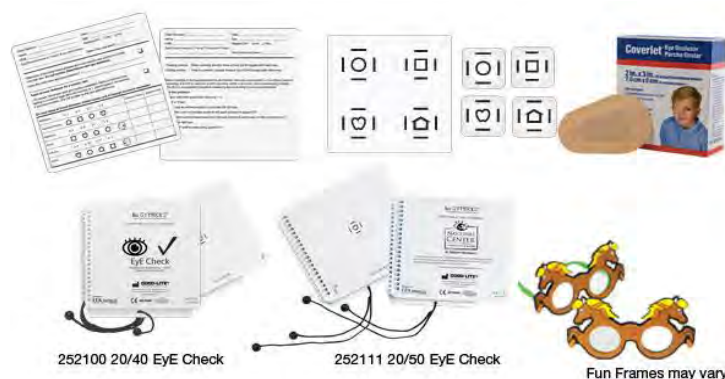
Pass:

- Each of the 7 options describes passing criteria.

Refer for comprehensive eye examination that includes dilating drops:

- Each of the 7 options describes referral criteria.

Option 1: Eye Check Screener with LEA SYMBOLS® – 5 Feet



Set Includes:

- 20/50 Booklet for 3-year-old children.
- 20/40 Booklet for 4- and 5-year-old children.
- Response panel for matching.
- Individual cards for matching.
- Adhesive eye patches.
- 1 set of occluder glasses.

Instructions for 20/50 Flipbook for 3-Year Old Children

Use the 20/50 vision screening flipbook with children aged 3 years; a separate 20/40 flipbook is available for children ages 4 and 5.

- Measure a 5-foot screening distance between flipbook and child's eyes using the attached cord.
- Begin by familiarizing the child with the screening task.
 - Hold the flipbook 16 inches from child's face.
 - With child's eyes uncovered, ask child to name the symbols (pictures) on cards 1 through 4.
 - Accept whatever name the child uses to identify each symbol.
- Occlude child's left eye, using an adhesive patch or specially constructed occluder glasses included in the kit. (Ensure child does not peek if using occluder glasses.)
- At 5 feet, and with child's left eye occluded, present flipbook at child's eye level.

- Ensure flipbook cards do not have glare from nearby windows or other light sources.
- Beginning with flipbook card 5, ask child to identify (by verbally naming or matching) each symbol on flipbook cards 5 through 8.
 - If matching, the child can use the lap card or the four individual cards to select the optotype that corresponds with the optotype to identify. Cards can be placed on a tabletop or on the floor in front of the child and child can point to, or lift the tabletop cards or step on the card on the floor.
- Circle correct responses, and mark an “X” through incorrect responses on the 3-Year-Old (20/50) Vision Screening Results Recording Form (See Appendix D, Document 3).
- Patch the child’s right eye (with same adhesive patch) or switch occluder glasses.
- Repeat screening and recording steps for the left eye, using flipbook cards 9 through 12.

Pass:

- Correct identification of 3 or 4 symbols with each eye.

Refer (or rescreen the same day, as soon as possible, or no later than 6 months):

- Correct identification of only 0, 1, or 2 symbols with either or both eyes.

Instructions for 20/40 Flipbook for 4- and 5-Year Old Children

Use this 20/40 vision screening flipbook with children aged 4 and 5 years; a separate 20/50 flipbook is available for children aged 3 years.

- Measure a 5-foot screening distance between flipbook and child’s eyes using the attached cord.
- Begin by familiarizing the child with the screening task.
 - Hold the flipbook 16 inches from child’s face.
 - With child’s eyes uncovered, ask child to name the symbols (pictures) on cards 1 through 4.
 - Accept whatever name the child uses to identify each symbol.
- Occlude child’s left eye, using an adhesive patch or specially constructed occluder glasses included in the kit (Ensure child does not peek if using occluder glasses).
- At 5 feet, and with child’s left eye occluded, present flipbook at child’s eye level.
 - Ensure flipbook cards do not have glare from nearby windows or other light sources.
- Beginning with flipbook card 5, ask child to identify (by verbally naming or matching) each symbol on flipbook cards 5 through 8.
 - If matching, the child can use the lap card or the four individual cards to select the optotype that corresponds with the optotype to identify. Cards can be placed on a tabletop or on the floor in front of the child and child can point to, or lift, the tabletop cards or step on the card on the floor.
- Circle correct responses, and mark an “X” through incorrect responses on the Vision Screening Results Recording Form (See Appendix D, Document 4).

- Patch the child's right eye (with same adhesive patch) or switch occluder glasses.
- Repeat screening and recording steps for the left eye, using flipbook cards 9 through 12.

Pass:

- Correct identification of 3 or 4 symbols with each eye individually.

Refer (or rescreen the same day or within 6 months):

- Correct identification of only 0, 1, or 2 symbols with either or both eyes.

Option 2: Sight Line Kit – 10 Feet



Set Includes:

- Booklet with 20/50 critical lines for children ages 3 years, 20/40 for ages 4 and 5 years, 20/32 for age 6 years.
- Parrot Frosted Occluder Glasses.
- Kay Pictures Sunflower Occluder Glasses.
- Response panel for matching.
- Four individual cards for matching.
- Cord to measure 10-foot distance.

Instructions

- This Sight Line flipchart is a “critical line” test of recognition visual acuity, which means each eye is screened separately using only the line a child should pass according to the child's age. Results are recorded as pass/refer.
- Use the 20/50 cards for screening children ages 3 years and the 20/40 cards for children ages 4 and 5 years (Note: the flipchart includes a 20/32 card for 6 years and older).
- Select a screening location that is at least 12 feet in length, and is quiet, free of distractions, and evenly lit.
- Measure 10 feet between the flip chart and the child's eyes with the cord included in the kit.
 - If placing a mark on the floor to maintain the 10-foot screening distance, ensure the child stands with the arch of his or her feet on the mark (Figure 22).
 - If using a chair, measure 10 feet to the back of the chair seat and ensure the child is seated with their back against the back of the chair (Figure 23).



Figure 22



Figure 23

- Begin by familiarizing the child with the screening task.
 - Hold the flipbook 16 inches from the child's face.
 - With the child's eyes uncovered, ask the child to name the symbols on the 20/100 card.
 - Accept whatever name the child uses to identify each symbol.
- Occlude the child's left eye, using a set of the specially constructed occluder glasses included in kit (Figure 24).
 - Sunflower occluder glasses can be used for smaller faces.
 - If the child is wearing prescription glasses, the occluder glasses go over the prescription glasses.

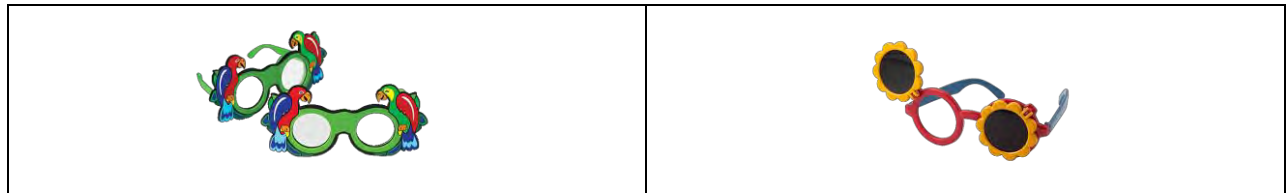


Figure 24

- Turn the flipbook to the RIGHT EYE card that matches the child's age (e.g. 20/50 or 20/40 right eye card).
- At 10 feet, and with the child's left eye occluded, present the flipbook at the child's eye level.
 - Ensure the flipbook cards do not have glare from nearby windows or other lighting sources.
 - Hold the flipbook perpendicular to the floor. Do not tilt the flipbook up or down (Figure 25).
- Ask the child to identify (by verbally naming or matching on the provided lap card) each symbol on the *right* eye card that matches the child's age (e.g., 20/50 if 3 years of age or 20/40 card if 4 years of age).
 - Alternatively, the child can use the four individual cards to select the optotype that corresponds with the optotype to identify (Figure 26).

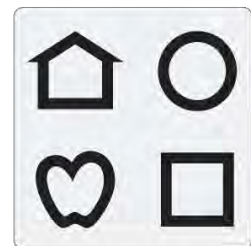


Figure 25

- Cards can be placed on a tabletop or on the floor in front of the child and child can point to, or lift, the tabletop cards or step on the card on the floor.
- Switch occluder glasses so that the child's *right* eye is occluded.
- Turn the flipbook to the *left* eye card that matches the child's age (i.e. 20/50 if 3 years of age or 20/40 card if 4 years of age).
- Ask the child to identify (by verbally naming or matching) each symbol on the *left* eye card that matches the child's age.
- Record the results as pass or refer.

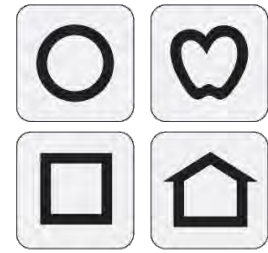


Figure 26

Pass:

- Correct identification of 3, 4, or 5 of 5 symbols with each eye individually.

Refer (or rescreen the same day, as soon as possible, or no later than 6 months):

- Correct identification of only 0, 1, or 2 symbols with either or both eyes.

Options 3 and 4 – AAPOS Basic Vision Screening Kit – 10 Feet – Threshold or Critical Line Formats

Kit Includes:

- LEA SYMBOLS® for children ages 3, 4, and 5 years in threshold and critical line formats.
- Sloan Letters for children beginning at ages 6 or 7 years, depending on when children can identify letters out of sequence, in threshold and critical line formats.
- Cord to measure 10 feet between chart and child's eyes.
- Occluder glasses.



AAPOS Basic Vision Screening Kit

Instructions for Option 3: LEA SYMBOLS® – Threshold Screening

Note:

- 10/xx on left side of chart is screening distance; 20/xx on right side of chart is the visual acuity value to record.
- Use with preschoolers beginning at age 3 years, until children can identify letters out of sequence, in threshold and critical line formats.

- Use 10-foot cord from Kit to measure screening distance between chart and child's eyes.
 - Child may stand during screening or sit on a chair.
 - If placing a mark on the floor to maintain the 10-foot screening distance, ensure the child stands with the arch of his or her foot on the mark (Figure 27).
 - If child sits in a chair, the 10-foot distance from the chart is the back of the chair and child sits with back against the back of the chair (Figure 28).



Figure 27



Figure 28

- Hold, or hang, chart at child's eye level.
- With both eyes uncovered, ask child to identify symbols on the 20/100 line to ensure child understands the screening task (Figure 29).
 - Accept whatever name the child uses to identify the LEA SYMBOLS® (e.g., circle may be a hula-hoop, etc.).
 - If child says "I don't know", screener can provide two choices and ask child to select one. For example, for the circle, the screener could say, "Some children think this is a circle; others think it is a ball. What do you think?"
- Children may use response panel to match symbols by pointing at the symbol, matching the symbol to correspond with the optotype on the chart.
 - Cover *left* eye with adhesive patch. Use occluder glasses only if patches are unavailable or are not tolerated.
 - Starting at the top line, ask child to identify the first symbol on the *right* side of each line and move down the chart until a symbol is missed.
 - Avoid pointing to, and holding pointer, at the symbols to be identified.
 - Isolating an optotype with a pointer, or masking all optotypes but one on a line, can lead to under-referrals or missing children who should be referred because the optotype is easier for the child to identify.
 - Instead, briefly point to the symbol and quickly remove pointer.
- When child misidentifies a symbol, return to the line above the missed symbol and ask child to identify each symbol on that line.
- Continue asking child to identify each optotype on each lower line until child misses 3 optotypes on one line (continue asking child to identify the full line even when 3 or more are missed, but stop screening after this line).

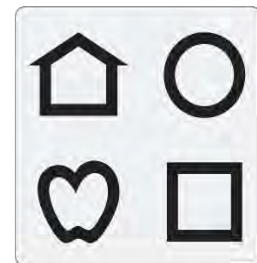


Figure 29

- Always say “good job” or other supportive words, even when child responds incorrectly.
- Repeat with *right* eye covered, using the first symbol on the *left* side of each line.

Visual acuity score:

- The last line on which the child correctly identified 3 of 5 symbols.

Age	Pass	Refer or Rescreen Within 6 Months
3 years	Correctly identifying 3 of 5 symbols on the 20/50 line with each eye separately	Missing 3 or more symbols on the 20/50 line, or any line above the 20/50 line, with either eye
4 years	Correctly identifying 3 of 5 symbols on the 20/40 line with each eye separately	Missing 3 or more symbols on the 20/40 line, or any line above the 20/40 line, with either eye
≥5 years	Correctly identifying 3 of 5 symbols on the 20/32 line with each eye separately	Missing 3 or more symbols on the 20/32 line, or any line above the 20/32 line, with either eye
3, 4, and ≥5 years		Two-line difference between the eyes, even within the passing range – e.g., 10/10 (20/20) and 10/16 (20/32)

Instructions for Option 4: LEA SYMBOLS® – Critical Line Screening

- Use with preschoolers beginning at age 3 years, until children can identify letters out of sequence, in threshold and critical line formats.
- Select the chart to match the child’s age; one chart is for ages 36-47 months, one is for ages 48-59 months, and one is for ages 5 years and older.
- Use 10-foot cord from Kit to measure screening distance between chart and child’s eyes.
 - Child may stand during screening or sit on a chair.
 - If placing a mark on the floor to maintain the 10-foot screening distance, ensure the child stands with the arch of his or her foot on the mark (Figure 30).
 - If child sits in a chair, the 10-foot distance from the chart is the back of the chair and child sits with back against the back of the chair (Figure 31).



Figure 30



Figure 31

- Hold, or hang, chart with critical passing line at child's eye level.
- With both eyes uncovered, ask child to identify symbols on the 20/100 line to ensure child understands the screening task (Figure 32).
 - Accept whatever name the child uses to identify the LEA SYMBOLS® (e.g., circle may be a hula-hoop, etc.).
 - If child says "I don't know", screener can provide two choices and ask the child to select one. For example, the screener could say, "Some children think this is a circle; others think it is a ball. What do you think?"
 - Children may use response panel to match symbols by pointing at the symbol matching the symbol to correspond with the optotype on the chart.
 - Cover *left* eye with patch and bottom boxed line on chart with your hand or paper. Use occluder glasses only if patches are unavailable or are not tolerated.
 - Ask child to identify symbols on top boxed line on chart.
 - Avoid pointing to, and holding pointer, at the symbols to be identified.
 - Isolating an optotype with a pointer, or masking all optotypes but one on a line, can lead to under-referrals or missing children who should be referred because the optotype is easier for the child to identify.
 - Instead, briefly point to the symbol and quickly remove pointer.
 - Repeat with *right* eye covered and top boxed line covered. Ask child to identify symbols on lower boxed line on chart.

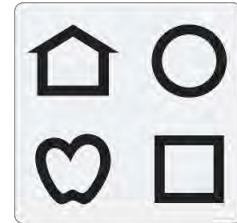
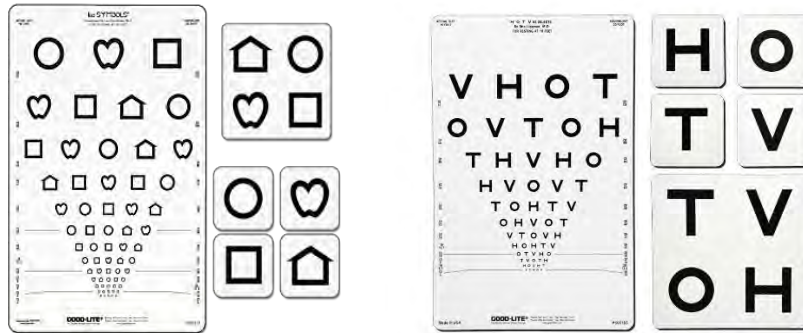


Figure 32

Age	Pass	Refer or Rescreen Within 6 Months
3 years	Correctly identifying 3 of 5 symbols on the 20/50 line with each eye separately	Missing 3 or more symbols on the 20/50 line with either eye
4 years	Correctly identifying 3 of 5 symbols on the 20/40 line with each eye separately	Missing 3 or more symbols on the 20/40 line with either eye
≥5 years	Correctly identifying 3 of 5 symbols on the 20/32 line with each eye separately	Missing 3 or more symbols on the 20/32 line with either eye

Options 5 and 6 – LEA SYMBOLS® or HOTV Proportionally Spaced Charts, 10 Feet



Instructions for Either Chart

- 10/xx on left side of chart is screening distance; 20/xx on right side of chart is the visual acuity value to record.
- Use with children beginning at age 3 years, if possible, and ages 4 and 5 years, or until children can identify letters out of sequence, and, then, switch to a Sloan Letters chart.
- Hang the chart, in a quiet, undistracted, well-lit area, with the 20/40 line at child's eye level.
 - Measure 10 feet between the chart and the child's eyes with the cord included in the kit.
 - If placing a mark on the floor to maintain the 10-foot screening distance, ensure the child stands with the arch of his or her foot on the mark (Figure 33).
 - If using a chair, measure 10 feet to the back of the chair seat and ensure the child is seated with their back against the back of the chair (Figure 34).



Figure 33



Figure 34

- Explain the screening task to child and say you are playing a game instead of saying you are testing their eyes.
- Place the lap card (square with all 4 optotypes) at 16 inches from child and ask child to name optotypes (Figure 35).

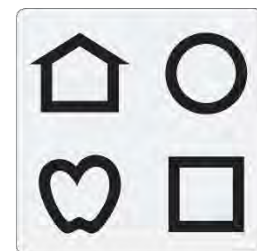


Figure 35

- If using LEA Symbols, accept whatever name the child uses to identify each symbol. The “square”, for example, could be a box or the “circle” a ball.
- Cover left eye with adhesive patch or fun frames occluder glasses and return to chart (Figure 36).

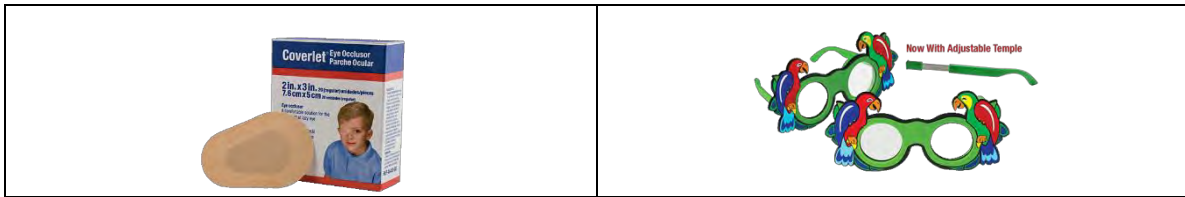


Figure 36

- For children wearing prescription glasses, the adhesive patch goes over the *left* eye first and beneath prescription glasses and the same adhesive patch may be used to cover the right eye. If using occluder glasses, place the occlude glasses over the child’s prescription glasses.
- Screen one eye at a time (monocularly); do not screen with both eyes open and uncovered.
- Starting at the top line on the *right* side of the chart, as child faces chart, ask child to identify the first optotype on the *right* side of each line and move down the chart until an optotype is missed (Figure 37).
- Avoid pointing to, and holding pointer, at the optotypes to be identified.
 - Isolating an optotype with a pointer, or masking all optotypes but one on a line, can lead to under-referrals or missing children who should be referred because the optotype is easier for the child to identify.
 - Instead, briefly point beneath the optotype and quickly remove pointer.
- Children may use the lap card (4 optotypes on one card) as a matching game (Figure 38).
- Alternatively, the child can use the four individual cards to select the optotype that corresponds with the optotype to identify (Figure 39).

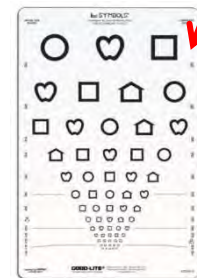


Figure 37

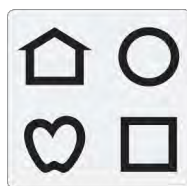


Figure 38

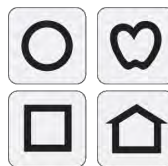


Figure 39

- Cards can be placed on a tabletop or on the floor in front of the child and child can point to, or lift, the tabletop cards or step on the card on the floor.
- When the child misidentifies an optotype, return to the line above the missed optotype and ask child to identify each optotype on that line, reading *left to right*.

- Continue asking child to identify each optotype on each lower line until child misses 3 optotypes on one line (continue asking child to identify the full line even when 3 or more are missed, but stop screening after this line).
- The smallest line of optotypes where at least 3 optotypes were identified correctly is the visual acuity value for that eye.
- On lines 20/125 and 20/160, the individual must correctly identify each optotype.
- Record your screening results for the right eye, using the 20/XX measurement.
- Occlude the *right* eye and begin screening the left eye.
- Starting at the top line on the *left* side of the chart, as child faces chart, ask child to identify the first optotype on the *left* side of each line (Figure 40).
- When the child misidentifies an optotype and returns to the line above the missed optotype to read the full line, the child identifies symbols from *left to right*.
- Record your screening results for the left eye, using the 20/XX measurement.

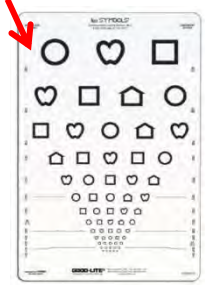


Figure 40

Visual acuity value:

- The smallest line of optotypes on which the child correctly identified at least 3 of 5 optotypes.
- Acuity values are written separately for each eye.

Age	Pass	Refer or Rescreen Within 6 Months
3 years	Correctly identifying 3 of 5 symbols on the 20/50 line with each eye separately	Missing 3 or more symbols on the 20/50 line, or any line above the 20/50 line, with either eye
4 years	Correctly identifying 3 of 5 symbols on the 20/40 line with each eye separately	Missing 3 or more symbols on the 20/40 line, or any line above the 20/40 line, with either eye
≥5 years	Correctly identifying 3 of 5 symbols on the 20/32 line with each eye separately	Missing 3 or more symbols on the 20/32 line, or any line above the 20/32 line, with either eye
3, 4, and ≥5 years		Two-line difference between the eyes, even within the passing range – e.g., 10/10 (20/20) and 10/16 (20/32)

Note:

To ensure appropriate illumination, this chart can be used with an ESV1200 LED- illuminated cabinet, which can be placed on a stand with casters or mounted on a wall (Figure 41).



Figure 41

Option 7: EyeSpy 20/20™ Computerized Vision Screening, 10 Feet



Note:

- Children play a 3-minute video matching game.
- Provides report with vision screening results in English or Spanish.
- Integrates with electronic medical records.

Instructions

- Available at: <https://www.good-lite.com/downloads/EyeSpyUserGuide.pdf>

3. Optional: Near Visual Acuity – Optotype-Based Screening

Notes:

- Near vision screening should include charts with attached 16-inch cords to ensure the screening distance is maintained.
- The 16-inch cord should remain near the student's temple during screening.
- The 16-inch cord should remain tight during screening to ensure the screening distance is maintained.
- Because no national guidelines are available for near vision screening, screeners may choose between 2 options:
 - Monocular threshold screening, or
 - Binocular critical line screening.

Purpose:

- To check visual acuity at near.

Screening Location:

- Well-lit room, free from distractions.

Equipment Needed:

- Screening tool from 2 options:
 1. LEA SYMBOLS® or HOTV Near Charts – Monocular Threshold Screening.
 2. LEA SYMBOLS® or HOTV Near Charts – Binocular Critical Line Screening.
- Appropriate occluders.

Procedure:

- Each of the 2 options describes how to arrange the environment and use the tool.

Pass:

- Each of the 2 options describes passing criteria.

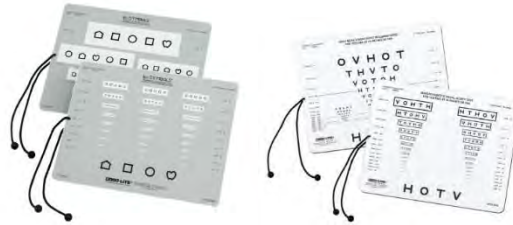
Refer for comprehensive eye examination that includes dilating drops:

- Each of the 2 options describes referral criteria.

Option 1: LEA SYMBOLS® or HOTV Near Charts – Monocular Threshold Screening

Note:

- 20/xx on right side of chart is Snellen equivalency and the number to record.
- Use with preschoolers beginning at age 3 years until children can identify letters out of sequence and can participate with a Sloan Letters chart.
- Student may stand or sit in a chair during screening.
- Use the attached cord to measure 16 inches between the chart and the temple near the student's right eye.
- With both eyes uncovered, ask the student to identify the symbols on the 20/200 line to ensure the student understands the screening task.
 - Accept whatever name students call the optotypes (e.g., circle may be a ball or a hula-hoop, etc.).
 - Students may point to the 4 symbols at the bottom of the chart as a matching game or use individual cards if included with the chart.
- Cover the student's *left* eye with adhesive patch. Use occluder glasses if patches are unavailable or are not tolerated.
- Starting at the 20/100 line, ask the student to identify the first optotype on the *right* side of each line, from the child's perspective, and move down the chart until a symbol is missed.
 - Avoid pointing to, and holding pointer, at the optotypes to be identified.
 - Isolating an optotype with a pointer, or masking all optotypes but one on a line, can lead to under-referrals or missing children who should be referred because the optotype is easier for the child to identify.
 - Instead, briefly point to the optotype and quickly remove pointer.
- When the student misidentifies an optotype, return to the line above the missed optotype and ask the student to identify each optotype on that line.
- Continue asking child to identify each optotype on each lower line until child misses 3 optotypes on one line (continue asking child to identify the full line even when 3 or more are missed, but stop screening after this line).
- Repeat with *right* eye covered, using the first symbol on the *left* side of each line.



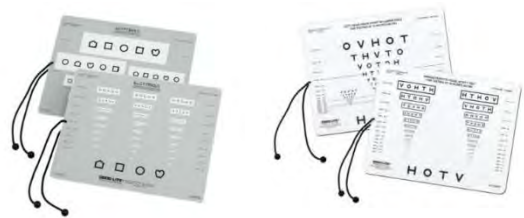
Visual acuity value for each eye:

- The last line on which child correctly identified 3 of 5 optotypes.

Age	Pass	Refer or Rescreen Within 6 Months
3 years	Correctly identifying 3 of 5 symbols on the 20/50 line with each eye separately	Missing 3 or more symbols on the 20/50 line, or any line above the 20/50 line, with either eye
4 years	Correctly identifying 3 of 5 symbols on the 20/40 line with each eye separately	Missing 3 or more symbols on the 20/40 line, or any line above the 20/40 line, with either eye
≥5 years	Correctly identifying 3 of 5 symbols on the 20/32 line with each eye separately	Missing 3 or more symbols on the 20/32 line, or any line above the 20/32 line, with either eye

Option 2: LEA SYMBOLS® or HOTV Near Charts – Binocular Critical Line Screening

- Use with preschoolers beginning at age 3 years until children can identify letters out of sequence and can participate with a Sloan Letters chart.
- Student may stand or sit in a chair during screening.
- Use the attached cord to measure 16 inches between the chart and the temple near the student's right eye.
- With both eyes uncovered, ask the student to identify the symbols on the 20/200 line to ensure the student understands the screening task.
 - Accept whatever name the students call the optotypes (e.g., circle may be a ball or a hula-hoop, etc.).
 - Students may point to the 4 symbols at the bottom of the chart as a matching game or use individual cards if included with the chart.
- With both eyes open, ask the student to identify the optotypes on the line that matches the student's age:
 - Aged 3 years = 20/50 line.
 - Aged 4 years = 20/40 line.
 - Aged 5 years and older = 20/32 line.



Age	Pass	Refer or Rescreen Within 6 Months
3 years	Correctly identifying 3 of 5 symbols on the 20/50 line	Missing 3 or more symbols on the 20/50 line
4 years	Correctly identifying 3 of 5 symbols on the 20/40 line	Missing 3 or more symbols on the 20/40 line
≥5 years	Correctly identifying 3 of 5 symbols on the 20/32 line	Missing 3 or more symbols on the 20/32 line

4. Instrument-Based Screening

Notes:

- Instruments do **not** provide information about visual acuity or vision functioning.
 - Instrument results may **not** be converted to visual acuity values (e.g., 20/20).
 - The printed refractive error estimate is **not** a formal prescription for eyeglasses and cannot be used to produce lenses.
- Hold instrument at the child's eye level; the child's head should be straight and level.
- Once instrument results are displayed, use the instrument's referral criteria.
- Instruments for this manual have been vetted by the National Center for Children's Vision and Eye Health at Prevent Blindness (National Center for Children's Vision and Eye Health, n.d.), meaning they have sufficient research to support usage with this age group.
- Monitor the NCCVEH website for updates on instruments (<https://nationalcenter.preventblindness.org/recommended-tools-and-tests>).

Tips:

- When receiving "pupils too small" message:
 - Reduce room lighting, if possible.
 - Hold a magazine at child's forehead to reduce lighting over child's eyes.
- If the child wears glasses screen with glasses on and lower the child's head about 1 inch to prevent instrument lights from reflecting off glasses.
- If a screener successfully captured readings on 10 or 15 students, the "wheel" on the instrument's results screen continues to spin on the 11th or 16th student, no error message appears on the screen (e.g., pupils too small), and the device times out, refer the student. Something about the eye may be preventing the instrument from receiving information from the eye (Nottingham Chaplin, Baldonado, Bradford, Cotter, & Moore, 2018).

Purpose:

- The goal of instrument-based screening is to identify amblyopia risk factors:
 - Significant refractive error (e.g., hyperopia, myopia, and astigmatism).
 - Anisometropia.
 - Eye misalignment.

Screening Location:

- Examination room or screening area.

Equipment Needed:

- Instrument.
- Magazine.

Procedure:

- Refer to the manufacturer instruction links provided below, as instructions could change.
- Links to instructions for two instruments are provided because the two instruments are currently approved by the National Center for Children's Vision and Eye Health at Prevent Blindness (NCCVEH, n.d.).

- Monitor this website because the list of approved instruments could change as additional research emerges:

<https://nationalcenter.preventblindness.org/instrument-based-vision-screening>

- Currently approved instruments include:

Welch Allyn® Spot™ Vision Screener

- Instructions – Welch Allyn® Spot™ Vision Screener:

<https://www.welchallyn.com/content/dam/welchallyn/documents/sap-documents/LIT/80019/80019495LITPDF.pdf>



Plusoptix S12C Vision Screener

- Instructions – Plusoptix S12C Vision Screener:

<https://plusoptix.com/images/support-downloads/user-manual-s12c-s12r-english.pdf>



Pass:

- Instrument results indicate all readings are within the normal range.

Refer for comprehensive eye examination:

- Instrument results will indicate if an eye examination is recommended.

5. Stereoacuity Screening

Pass Test 2 – Preschool Assessment of Stereopsis with a Smile



Tool includes:

- Card A = Demonstration card with smiling face.
- Card B = Ages 3 and 4 years.
- Card C = Ages 5 years and older.
- Blank card.
- Small polarized glasses.
- Intermediate polarized glasses.
- Measuring cord.
- Carrying pouch.

Notes:

- Conduct the stereoacuity screening only in conjunction with optotype-based screening.

- Stereoacuity screening is not required if doing instrument-based screening.
- The arrow on the back of each card must point upward.
- If cards are dirty or smudged, clean the cards with a soft, damp, lint-free cloth.
 - Dampen cloth with glass cleaner or mild detergent and water.
- Handle cards with fingertips on edges of cards.
- Store the stereo test in a cool dry place when not in use. High heat and humidity may cause the test to fade.
- This screening tool is included in recommendations from the National Expert Panel to the National Center for Children’s Vision and Eye Health at Prevent Blindness (Cotter et al., 2015).

Purpose:

- To determine if both eyes work together.

Screening Location:

- Well-lit area with no distractions.
- Prior to screening, the screener should ensure area to be used is free of glare by standing or sitting where the student will stand or sit during screening and holding a blank card and either card B or C at a 10-degree angle (top of cards away from eyes) at eye level. If a glare is present, select a different location.
- Inspect all cards to ensure each card is clean and free of smudges.

Procedure:

- Use the 16-inch string to measure the distance between the student’s eyes and where the cards will be held during screening.
- Place the polarized glasses on the child.
 - If the student is wearing glasses, place polarized glasses over the student’s glasses.
 - If the student cannot point to Card B during screening while wearing prescription glasses beneath the polarized glasses, remove prescription glasses and rescreen with the student wearing only the polarized glasses.
- If the student cannot point to Card B during screening wearing only the polarized glasses and not prescription glasses, rescreen within 6 months or refer.
- Show the student Card A (demonstration card with smiling face).
 - The back of each card is labeled.
 - Arrows on back of cards must point upward.
 - Hold cards with edges of fingertips.
- Tell the student a picture is “popping” off the card.
- Ask the student to name the picture.
- Ask the student to point to the picture on the card.
- After showing the student the demonstration card, show both the blank card and Card A (the demonstration card).
 - Hold Card A and the blank card in front of the student, 16 inches from the student’s eyes, and at a 10-degree angle (top of cards tilted toward the screener).
 - Hold the blank card and the card with the stereo image at the exact same distance from the student, but allowing a space of about one inch between

cards to assist in determining which card the student selects as having the smile face.

- Ask the student to point to the card with the smiling face.
 - Watch the student's eyes to determine if the student is looking at both cards before identifying the card with the smiling face.
 - If necessary, remind the student each time to look at both cards before pointing.
- Present the blank card and Card B.
- Tell the student the image is hiding in one of the cards.
- Ask the student to point to the card with the smiling face (or name the student used for the smiling face [e.g., moon]).
 - If the student cannot point to Card B, stop screening and either rescreen within 6 months or refer.
- Present Card B and the blank card a maximum of 5 times.
 - Shuffle cards behind back before each presentation.
 - Avoid creating patterns of presentation (e.g., right, left, right, left, or right, right, left, left).
- For students aged 5 years and older, if the student correctly identifies Card B 4 of 4 or 4 of 5 presentations, replace Card B with Card C, and repeat the screening steps.

Age	Pass	Refer or Rescreen Within 6 Months
3 and 4 years	Correctly identifies the smiling face 4 of 4 or 4 of 5 presentations with Card B.	Does not correctly identify the smiling face 4 of 4 or 4 of 5 presentations with Card B
≥5 years	Correctly identifies the smiling face 4 of 4 or 4 of 5 presentations with both Cards B and C	Does not correctly identify the smiling face 4 of 4 or 4 of 5 presentations with both Cards B and C

6. Optional: Color Vision Deficiency Screening

Notes:

- Color vision deficiency disorders are usually hereditary.
- The early detection of color vision deficiency disorders is important because many classrooms use color-oriented and/or color-coded learning activities and educational supplies.
- A color vision deficiency disorder is not treatable.
- Awareness of color vision deficiency disorders is helpful for parents and teachers to make accommodations for the home and classroom, if required.
- Awareness of color vision deficiency disorders can help students choose careers that do not rely on normal color vision.
- Use paintbrush or cotton-tipped swab for tracing; oil from fingertips will desaturate colors.

- When not in use, store color vision deficiency screening books in a dark area (e.g., cabinet drawer).
- Color vision deficiency screening books should be replaced every 5 to 7 years because colors desaturate over time.

Purpose:

- To check for color vision deficiencies that may interfere with the child's learning.

Screening Location:

- Well-lit room, free from distractions, and with supplemental lighting.
 - To ensure accurate color vision screening results, use natural daylight lamps, such as the Foldi™ LED Lamp, a Color Test Daylight Illuminator, or a Twist Portable Lamp.
 - Do not use lights that give off a yellow tinted illumination.

Equipment Needed:

- Screening tool from 2 options:
 - ColorCheck Complete Vision Screener.
 - HRR Standard Pseudoisochromatic Test, 4th Edition.
- Table.
- Chair.
- Paintbrush or cotton-tipped swab for tracing symbols or numbers.
- Color Vision Deficiency Screening Results Letter for Parents/Caregivers (Appendix D, Document 7).

Option 1: ColorCheck Complete Vision Screener

Notes:

- Includes LEA SYMBOLS® for young students and LEA NUMBERS® for older students.
- Plates are numbered at the bottom left and upper right corners of each page.
- Plates 19-26 are pediatric symbols to use with children who do not know their numbers.
 - Plate 19 is a demonstration card and all children should be able to identify 3 symbols on the demo plate, regardless of whether a student has a color vision deficiency.
- Plates 1-8 are numbers to use with students who know their numbers.
 - Plate 1 is a demonstration card and all individuals being screened should be able to identify the number on the demo card, regardless of whether a color vision deficiency is present.
- Plates 9-15 are optional and used for additional screening.
- Plate 16 is optional and screens for severity of color vision deficiency.
 - Plates 17 and 18 are optional to help screen for the tritanopia type of color vision deficiency (confusing blue with green and yellow with violet).
- Store the cards in a dark drawer when not in use.



Procedure:

- Hold plates 24-30 inches from the face and at a right angle to the child's line of sight.
- Allow 3 seconds for the child to identify each plate.
 - Hesitation is an indication the child may have a color vision deficiency.
- Students may verbally identify the symbols or numbers, or trace symbols or numbers with a small paint brush or cotton swab.
 - Do not trace symbols or numbers with fingers; oil from fingertips will desaturate colors.

Color Plates	Pass	Refer or Rescreen Within 6 Months
Pediatric – 19-26	Correctly identifying all symbols on plates 19-26	Incorrectly identifying or not seeing all symbols on plates 19-26
Number – 1-8	Correctly identifying all numbers on plates 1-8	Incorrectly identifying or not seeing all numbers on plates 1-8

Option 2: HRR Standard Pseudoisochromatic Test, 4th Edition

Notes:

- Includes 24 plates.
 - 4 demonstration plates.
 - 6 screening plates.
 - 14 diagnostic plates.
- Use the 4 demonstration and 6 screening plates for color vision deficiency screening.



Procedure:

- Show the first 4 plates to the child demonstrating how the screening tool works.
- Starting with the first of the 6 screening plates:
 - Hold plates 24-30 inches from the child's face at a right angle to the line of sight.
 - Allow 3 seconds for the child to identify each plate.
 - Hesitation is an indication that the child may have a color vision deficiency.
- Students may verbally identify the symbols, or trace symbols with a small paint brush or cotton swab.
 - Do not trace the numbers or symbol plates with fingers; oil from fingertips will desaturate colors.

Plates	Pass	Refer or Rescreen Within 6 Months
4 Demonstration plates	Correctly identifying 4 demonstration plates	Incorrectly identifying symbols on 4 demonstration plates
6 Screening plates	Correctly identifying all symbols on 6 screening plates	Incorrectly identifying or not seeing all symbols on 6 screening plates

Chapter 6

6 Years and Older

Instrument-based screening is **not** recommended for children ages 6 years and older unless children cannot participate in optotype-based screening (Donahue et al., 2016).

Procedure Guidance

Recommended procedures for school-age screening are based on the following guidelines or documents:

- A 2016 joint statement from the American Academy of Pediatrics, the American Association for Pediatric Ophthalmology and Strabismus, the American Academy of Ophthalmology, and the American Association of Certified Orthoptists (Donahue et al., 2016).
- A 2017 Preferred Practice Pattern paper for pediatric eye evaluations in primary care and community settings from the American Academy of Ophthalmology (American Academy of Ophthalmology, 2017).
- A 2015 position statement from Prevent Blindness on school-based vision screening and eye health programs (Prevent Blindness, 2015).

Procedures:

In addition to the legal requirement for distance visual acuity, the following screenings are recommended for this age group (School nurses should also review local district requirements.):

1. ABC's of Vision.
2. Distance Visual Acuity – Optotype-Based Screening.
3. Optional: Near Visual Acuity – Optotype-Based Screening.
4. Instrument-Based Screening – Only for children who cannot participate in optotype-based screening.
5. Stereoacuity Screening.
6. Optional: Color Vision Deficiency Screening.

1. ABCs of Vision

Purpose:

- To check for signs of a possible vision problem.

Screening Location:

- Well-lit room free from distractions.

Equipment Needed:

- ABCs of Vision Checklist from Appendix D, Document 2.

Procedure:

- Observe student using ABCs of Vision Checklist
- Continue to screen the student's vision, whether or not the student exhibits any of the signs on the checklist.

Pass:

- No signs of possible vision disorders from the checklist.

Refer for comprehensive eye examination that includes dilating drops:

- Student exhibits signs of possible vision disorders from the checklist, even if the student passes vision screening

2. Distance Visual Acuity – Optotype-Based Screening

Notes:

- Evidence-based charts should be used during optotype-based screening because the design of the chart can significantly affect visual acuity scores (Bailey, 2012).
- Review Chapter 2 for evidence-based charts, occluders, how to point correctly at optotypes if necessary, room arrangement, positioning of student, along with other principles of vision screening.
- For children ages 6 years and older, Sloan Letters are the preferred optotypes (Donahue et al., 2016; American Academy of Ophthalmology, 2017).
- The preferred screening distance in this age group is 10 feet.
- See Appendix C for vision screening tools that are **not** recommended.

Purpose:

- To check visual acuity at distance.

Screening Location:

- Well-lit room, free from distractions.

Equipment Needed:

- Screening tool from 4 options:
 - Option 1: Sloan Letters Proportionally Spaced logMAR Chart 20/50.
 - Option 2: AAPOS Basic Vision Screening Kit – Threshold Screening chart.
 - Option 3: AAPOS Basic Vision Screening Kit – Critical Line chart.
 - Option 4: EyeSpy 20/20™ Computerized Vision Screening.
- Appropriate occluders.

Procedure:

- Each of the options describes how to arrange the environment and use the tool.

Pass:

- Each of the options describes passing criteria

Refer for comprehensive eye examination:

- Each of the options describes referral criteria.

Option 1: Sloan Letters Proportionally Spaced logMAR Chart

Note:

- 10/xx on left side of chart is screening distance; 20/xx on right side of chart is Snellen equivalency and the number to record.



- Use when children recognize letters out of sequence and with adolescents and adults.
- Hang the chart, in a quiet, undistracted, well-lit area, with the 20/32 line at the individual's eye level.
- Measure 10-feet between chart and individual's eyes.
- Individual may stand during screening, or sit on a chair.
 - If the individual stands on a line, position the *arch of each foot* on the line (Figure 42)
- If seated, measure 10 feet to the back of the chair seat and ensure the individual sits with his or her back against back of chair (Figure 43).



Figure 42



Figure 43

- Explain the screening task to the individual.
 - Tell the individual you are checking their eyes one at a time to make sure they can see well with each eye.
 - Depending on the age of the individual, words such as, “I will cover one of your eyes at a time and ask you to name the letters on the chart” could be used.
- Cover *left* eye with adhesive patch, tape, or occluder glasses before age 10 years and either a “lolly pop” or a “Mardi Gras mask” occluder for ages 10 year and older to screen the right eye (Figure 44).
 - If the individual is wearing prescription glasses:
 - The occluder glasses go over the glasses,
 - The “lollypop” occluder goes over the eye beneath prescription glasses, and
 - The “Mardi Gras mask” goes over glasses.

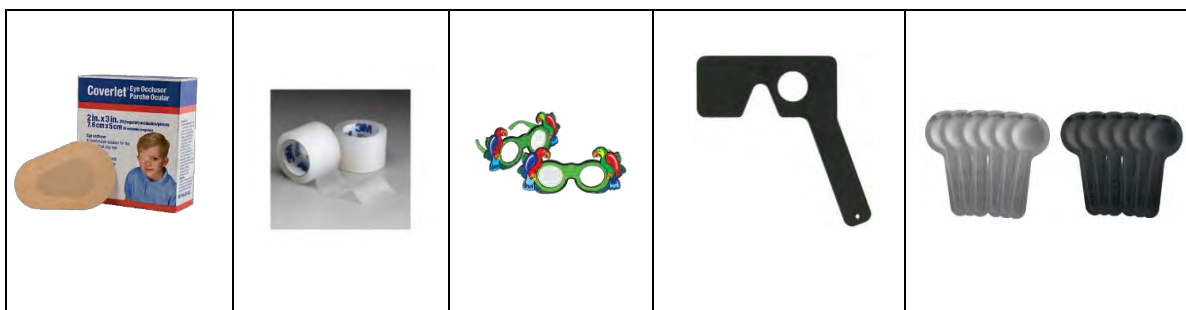


Figure 44

- Screen one eye at a time (monocularly); do not screen with both eyes open and uncovered.
- Starting at the top line on the *right* side of the chart, from the child's perspective, ask the individual to identify the first letter on the *right* side of each line and move down the chart until a letter is missed (Figure 45).
- Avoid pointing to, and holding pointer, at the letters to be identified.
 - Isolating an optotype with a pointer, or masking all optotypes but one on a line, can lead to under-referrals or missing children who should be referred because the optotype is easier for the child to identify.
 - Instead, briefly point beneath the letter and quickly remove pointer.
- When the individual misidentifies a letter with the right eye, return to the line above the missed letter and ask the individual to identify each letter on that line, reading *left to right*.
- If the individual correctly identifies the first letter on the last line of the chart, ask the individual to identify all letters on that line of the chart. If the individual correctly identifies at least 3 of 5 letters, 20/10 is the visual acuity value for that eye.
- If the individual misses 3 or more letters on the 20/10 line of the chart, move to the next line up, the 20/12.5 line, and ask the individual to identify each letter on that line.
- If the individual misses 3 or more letters on the 20/12.5 line, move up to the 20/16 line.
- Continue moving up a line until the individual correctly identifies at least 3 of 5 letters. That line is the visual acuity value for that eye.
- On lines 20/125 and 20/160, the individual must correctly identify each letter.
- Record screening results for the right eye, using the 20/XX measurement.
- Occlude the *right* eye and begin screening the left eye.
- Starting at the top line on the *left* side of the chart, as individual faces chart, ask the individual to identify the first letter on the *left* side of each line (Figure 46).
- When the individual misidentifies a letter and returns to the line above the missed letter to read the full line, the individual identifies letters from *left to right*.
- Record screening results for the left eye, using the 20/XX measurement.
- **NOTE:** On the 20/40 line, the lines split into 2 smaller charts, or columns, of 5 optotypes (Figure 47).



Figure 45

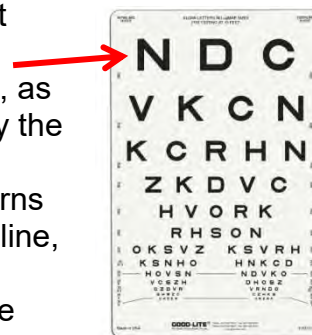


Figure 46

- Use the *right* column for the *right* eye, as individual faces the chart, and the *left* column for the *left* eye.
 - Example: When the left eye is covered and the individual misidentifies the first letter on the *right* side of the 20/25 line of the *right* column, move up to the 20/32 line and ask the individual to identify all 5 letters on that line, reading *left to right*.
 - Example: When the right eye is covered and the individual misidentifies a letter on the *left* side of the 20/25 line of the *left* column, move up to the 20/32 line and ask the individual to identify all 5 letters, reading *left to right*.

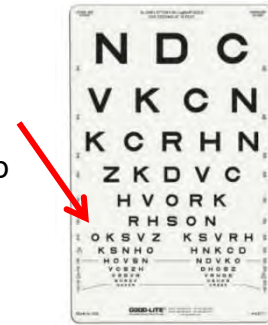


Figure 47

Visual acuity value:

- The smallest line of letters on which the individual correctly identified at least 3 of 5 letters. The acuity value is written for each eye.

Pass:

- Correctly identifying at least 3 of 5 letters on the 20/32 line, or any line below the 20/32 line, with each individual eye.

Refer:

- Missing 3 or more letters on the 20/32 line, or any line above the 20/32 line, with either eye.

Refer:

- Two-line difference between the eyes, even within the passing range (e.g., 20/20 and 20/32).

Options 2 and 3 – AAPOS Basic Vision Screening Kit – Threshold or Critical

Line Formats (Note: The AAPOS kit is listed in Chapters 5 and 6 because this kit is for all ages. Charts with LEA SYMBOLS® are for children ages 3, 4, and 5 years or until they know their letters out of sequence and are ready for Sloan Letters. This chapter describes Sloan Letters.)

Includes Sloan Letters for children ages 5 years and older in threshold and critical line screening formats. Begin using Sloan Letters only when children know their letters out of sequence.



Option 2: Sloan Letters – Threshold Screening

10/xx on left side of chart is screening distance; 20/xx on right side of chart is Snellen equivalency and the number to record.

- Use with children beginning at age 6 years or when children comfortably recognize letters out of sequence.
- Use 10-foot cord from Kit to measure screening distance between chart and child's eyes.
 - Child may stand during screening or sit on a chair.
 - If child stands, position the arches of the feet on the line 10-feet from the chart (Figure 48).
- If child sits in a chair, measure 10 feet from the chart to the back of the chair and ensure the child sits with their back against the back of the chair (Figure 49).



Figure 48



Figure 49

- Hold, or hang, chart with the 20/32 line at the child's eye level.
- Cover left eye with adhesive patch. Use occluder glasses only if patches are unavailable or are not tolerated. Use black occluder ("Mardi Gras" mask) in kit only for children aged 10 years and older (Figure 50).



Figure 50

- Starting at the top line, ask child to identify the first optotype on the right side of each line, from the child's perspective, and move down the chart until an optotype is missed.
 - Avoid pointing to, and holding pointer, at the optotypes to be identified.
 - Isolating an optotype with a pointer, or masking all optotypes but one on a line, can lead to under-referrals or missing children who should be referred because the optotype is easier for the child to identify.
 - Instead, briefly point to the optotype and quickly remove pointer.
- When child misidentifies an optotype, return to the line above the missed optotype and ask child to identify each optotype on that line.

- Continue asking child to identify each optotype on each lower line until child misses 3 optotypes on one line (continue asking child to identify the full line even when 3 or more are missed, but stop screening after this line).
 - Always say “good job” or other supportive words, even when child responds incorrectly.
- Repeat with right eye covered, using the first optotype on the left side of each line, from the child’s perspective.

Visual acuity score:

- The last line on which the child correctly identified 3 of 5 symbols.

Pass:

- Ages 6 years and older = correctly identifying 3 of 5 symbols on the 20/32 line, or any line below the 20/32 line, with each eye.

Refer:

- Ages 6 years and older = missing 3 or more symbols on the 20/32 line, or any above the 20/32 line, with either eye, **OR**

Refer:

- Two-line difference between the eyes, even within the passing range – e.g., 10/10 (20/20) and 10/16 (20/32).

Option 3: Sloan Letters – Critical Line Screening

Use when children know their letters.

- Select chart for children ages 6 years and older.
- Use 10-foot cord from Kit to measure screening distance between chart and child’s eyes.
 - Child may stand during screening or sit on a chair.
 - If child stands, position the arches of the feet on the line 10-feet from the chart (Figure 51).
- If child sits in a chair, measure 10 feet to the back of the chair and ensure the child sits with back against the back of the chair (Figure 52).



Figure 51



Figure 52

- Hold, or hang, chart with critical passing line at child’s eye level.
- Cover left eye with patch and bottom boxed line on chart with your hand or paper. Use occluder glasses only if patches are unavailable or are not tolerated. Use black (“Mardi Gras” mask) occluder in kit only for children aged 10 years and older (Figure 53).

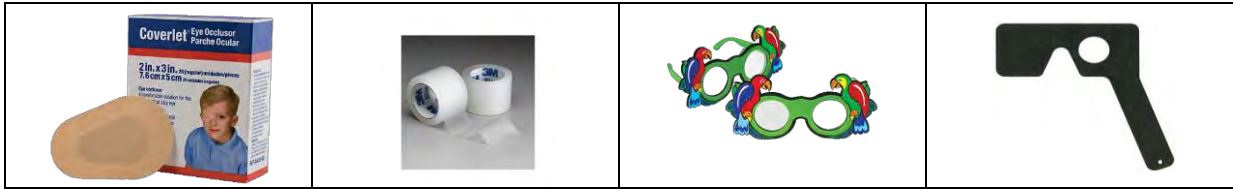


Figure 53

- Ask child to identify optotypes on top boxed line on chart.
 - Avoid pointing to, and holding pointer, at the optotypes to be identified.
 - Isolating an optotype with a pointer, or masking all optotypes but one on a line, can lead to under-referrals or missing children who should be referred because the optotype is easier for the child to identify.
 - Instead, briefly point to the symbol and quickly remove pointer.
 - Repeat with right eye covered and top boxed line covered. Ask child to identify symbols on lower boxed line on chart.

Pass:

- Ages 6 years and older = correctly identifying 3 of 5 symbols on the 20/32 line with each eye.

Refer:

- Ages 6 years and older = missing 3 or more symbols on the 20/32 line with either eye.

Option 4: EyeSpy 20/20™ Computerized Vision Screening (with Sloan Letters)

Note:

- Children play a 3-minute video matching game.
- Provides report with vision screening results in English or Spanish.
- Integrates with electronic medical records.

**Instructions:**

- Available at: <https://www.good-lite.com/downloads/EyeSpyUserGuide.pdf>

3. Optional: Near Visual Acuity – Optotype-Based Screening

Notes:

- Near vision screening should include charts with attached 16-inch cords to ensure the screening distance is maintained.
- The 16-inch cord should remain near the student's temple during screening.
- The 16-inch cord should remain tight during screening to ensure the screening distance is maintained.
- Because no national guidelines are available for near vision screening, screeners may choose between 2 options:
 - Monocular threshold screening, or
 - Binocular critical line screening.

- If conducting monocular threshold screening, the following occluders are recommended:

Occluders

- Recommendations are based on occluders included with a vision screening kit created with the American Association for Pediatric Ophthalmology and Strabismus – adhesive patches, occluder glasses, and black mask.
- Donahue et al. (2016) and the American Academy of Ophthalmology (2017) recommend adhesive eye patches and tape.
- Recommended occluders for children ages 6, 7, 8, and 9 years include (Figure 54):
 - Adhesive patches,
 - 2-inch wide, hypoallergenic surgical tape, and
 - Occluder glasses.



Figure 54

- Recommended occluders for children ages 10 years and older include (Figure 55):
 - “Mardi Gras” mask occluder, or
 - “Lollypop” occluders (held with handle pointing toward temple).



Figure 55

Purpose:

- To check visual acuity at near.

Screening Location:

- Well-lit room, free from distractions.

Equipment Needed:

- Sloan Letters Near Card with cord.
- Appropriate occluder.

Procedure:

- Two options for using the Sloan Letters Near Card describe how to arrange the environment and use the tool.

Pass:

- Each of the 2 options for using the Sloan Letters Near Card provides passing criteria.

Rescreen within 6 months or refer:

- Each of the 2 options for using the Sloan Letters Near Card describes referral criteria.

Option 1 – Sloan Letters – Monocular Threshold Screening

Note:

- 20/xx on right side of chart is Snellen equivalency and the number to record.
- Use when children can recognize letters out of sequence.
- Student may stand or sit in a chair during screening.
- Use the attached cord to measure 16 inches between the chart and the temple near the student's right eye.
- Cover *left* eye with adhesive patch, tape, or occluder glasses before age 10 years and either a “lolly pop” or a “Mardi Gras mask” occluder for ages 10 year and older to screen the right eye (Figure 56).
- If the individual is wearing prescription glasses:
 - The occluder glasses go over the glasses,
 - The “lolly pop” occluder goes over the eye beneath prescription glasses, and
 - The “Mardi Gras mask” goes over glasses.

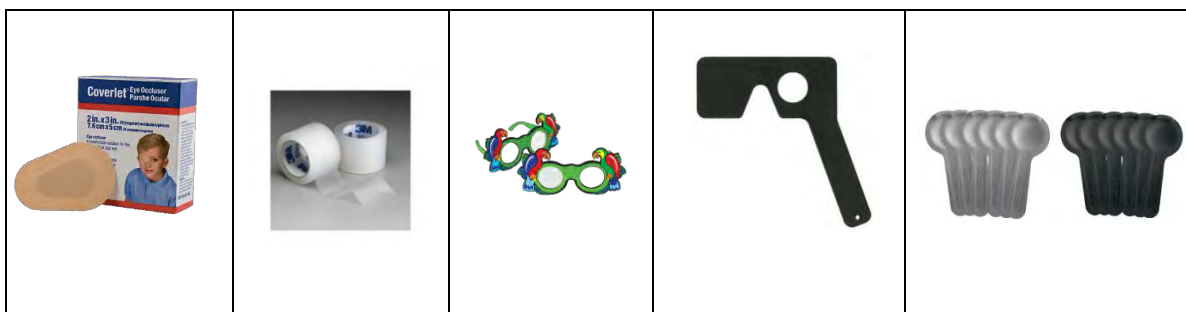


Figure 56

- Starting at the 20/100 line, ask the student to identify the first optotype on the *right* side of each line, from the child's perspective, and move down the chart until a symbol is missed.
 - Avoid pointing to, and holding pointer, at the optotypes to be identified.

- Isolating an optotype with a pointer, or masking all optotypes but one on a line, can lead to under-referrals or missing children who should be referred because the optotype is easier for the child to identify.
- Instead, briefly point to the optotype and quickly remove pointer.
- When the student misidentifies an optotype, return to the line above the missed optotype and ask the student to identify each optotype on that line.
- Continue asking child to identify each optotype on each lower line until child misses 3 optotypes on one line (continue asking child to identify the full line even when 3 or more are missed, but stop screening after this line).
- Repeat with *right* eye covered, using the first symbol on the *left* side of each line from the child's perspective.

Visual acuity value for each eye:

- The last line on which child correctly identified 3 of 5 optotypes.

Pass:

- Ages 6 years and older = correctly identifying 3 of 5 optotypes on the 20/32 line with each eye.

Rescreen within 6 months or refer:

- Ages 6 years and older = missing 3 or more optotypes on the 20/32 line, or any line above the 20/32 line, with either eye.

Option 2 – Sloan Letters – Binocular Critical Line Screening

- Use when students can recognize letters out of sequence.
 - Student may stand or sit in a chair during screening.
 - Use the attached cord to measure 16 inches between the chart and the temple near the student's right eye.
 - With both eyes open, ask the student to identify the optotypes on the 20/32 line.



Pass:

- Aged 6 years and older = correctly identifying 3 of 5 optotypes on the 20/32 line.

Rescreen within 6 months or refer:

- Aged 6 years and older = missing 3 or more optotypes on the 20/32 line.

4. Instrument-Based Screening – Only for children who cannot participate in optotype-based screening

Notes:

- Instruments do not provide information about visual acuity or vision functioning.

- Instrument results may **not** be converted to visual acuity values (e.g., 20/20).
- The printed refractive error estimate is **not** a formal prescription for eyeglasses and cannot be used to produce lenses.
- Hold instrument at the child's eye level; the child's head should be straight and level.
- Once instrument results are displayed, use the instrument's referral criteria.
- Instruments for this manual have been vetted by the National Center for Children's Vision and Eye Health at Prevent Blindness (National Center for Children's Vision and Eye Health, n.d.), meaning they have sufficient research to support usage with this age group.
- Monitor the NCCVEH website for updates on instruments (<https://nationalcenter.preventblindness.org/recommended-tools-and-tests>).

Tips:

- When receiving "pupils too small" message:
 - Reduce room lighting, if possible.
 - Hold a magazine at child's forehead to reduce lighting over child's eyes.
- If the child wears glasses screen with glasses on and lower the child's head about 1 inch to prevent instrument lights from reflecting off glasses.
- If a screener successfully captured readings on 10 or 15 students, the "wheel" on the instrument's results screen continues to spin on the 11th or 16th student, no error message appears on the screen (e.g., pupils too small), and the device times out, refer the student. Something about the eye may be preventing the instrument from receiving information from the eye (Nottingham Chaplin, Baldonado, Bradford, Cotter, & Moore, 2018).

Purpose:

- The goal of instrument-based screening is to identify amblyopia risk factors:
 - Significant refractive error (e.g., hyperopia, myopia, and astigmatism).
 - Anisometropia.
 - Eye misalignment.

Screening Location:

- Examination room or screening area.

Equipment Needed:

- Instrument.
- Magazine.

Procedure:

- Refer to the manufacturer instruction links provided below, as instructions could change.
- Links to instructions for two instruments are provided because the two instruments are currently approved by the National Center for Children's Vision and Eye Health at Prevent Blindness (NCCVEH, n.d.).
 - Monitor this website because the list of approved instruments could change as additional research emerges:
<https://nationalcenter.preventblindness.org/instrument-based-vision-screening>

- Currently approved instruments include:

Welch Allyn® Spot™ Vision Screener

- Instructions – Welch Allyn® Spot™ Vision Screener:

<https://www.welchallyn.com/content/dam/welchallyn/documents/sap-documents/LIT/80019/80019495LITPDF.pdf>



Plusoptix S12C Vision Screener

- Instructions – Plusoptix S12C Vision Screener:

<https://plusoptix.com/images/support-downloads/user-manual-s12c-s12r-english.pdf>



Pass:

- Instrument results indicate all readings are within the normal range.

Refer for comprehensive eye examination:

- Instrument results will indicate if an eye examination is recommended.

5. Stereoacuity Screening

Pass Test 2 – Preschool Assessment of Stereopsis with a Smile



Tool includes:

- Card A = Demonstration card with smiling face.
- Card B = Ages 3 and 4 years.
- Card C = Ages 5 years and older.
- Blank card.
- Small polarized glasses.
- Intermediate polarized glasses.
- Measuring cord.
- Carrying pouch.

Notes:

- Conduct the stereoacuity screening only in conjunction with optotype-based screening.
- Stereoacuity screening is not required if doing instrument-based screening.
- The arrow on the back of each card must point upward.
- If cards are dirty or smudged, clean the cards with a soft, damp, lint-free cloth.
- Dampen cloth with glass cleaner or mild detergent and water.
- Handle cards with fingertips on edges of cards.

- Store the stereo test in a cool dry place when not in use. High heat and humidity may cause the test to fade.
- This screening tool is included in recommendations from the National Expert Panel to the National Center for Children's Vision and Eye Health at Prevent Blindness (Cotter et al., 2015).

Purpose:

- To determine if both eyes work together.

Screening Location:

- Well-lit area with no distractions.
- Prior to screening, the screener should ensure area to be used is free of glare by standing or sitting where the student will stand or sit during screening and holding a blank card and either card B or C at a 10-degree angle (top of cards away from eyes) at eye level. If a glare is present, select a different location.
- Inspect all cards to ensure each card is clean and free of smudges.

Procedure:

- Use the 16-inch string to measure the distance between the student's eyes and where the cards will be held during screening.
- Place the polarized glasses on the child.
 - If the student is wearing glasses, place polarized glasses over the student's glasses.
 - If the student cannot point to Card B during screening while wearing prescription glasses beneath the polarized glasses, remove prescription glasses and rescreen with the student wearing only the polarized glasses.
 - If the student cannot point to Card B during screening wearing only the polarized glasses and not prescription glasses, rescreen within 6 months or refer.
- Show the student Card A (demonstration card with smiling face).
 - The back of each card is labeled.
 - Arrows on back of cards must point upward.
 - Hold cards with edges of fingertips.
- Tell the student a picture is "popping" off the card.
- Ask the student to name the picture.
- Ask the student to point to the picture on the card.
- After showing the student the demonstration card, show both the blank card and Card A (the demonstration card).
 - Hold Card A and the blank card in front of the student, 16 inches from the student's eyes, and at a 10-degree angle (top of cards tilted toward the screener).
 - Hold the blank card and the card with the stereo image at the exact same distance from the student, but allowing a space of about one inch between cards to assist in determining which card the student selects as having the smile face.
- Ask the student to point to the card with the smiling face.
 - Watch the student's eyes to determine if the student is looking at both cards before identifying the card with the smiling face.

- If necessary, remind the student each time to look at both cards before pointing.
- Present the blank card and Card B.
- Tell the student the image is hiding in one of the cards.
- Ask the student to point to the card with the smiling face (or name the student used for the smiling face [e.g., moon]).
 - If the student cannot point to Card B, stop screening and either rescreen within 6 months or refer.
- Present Card B and the blank card a maximum of 5 times.
 - Shuffle cards behind back before each presentation.
 - Avoid creating patterns of presentation (e.g., right, left, right, left, or right, right, left, left).
- For students aged 5 years and older, if the student correctly identifies Card B 4 of 4 or 4 of 5 presentations, replace Card B with Card C, and repeat the screening steps.

Age	Pass	Refer or Rescreen Within 6 Months
3 and 4 years	Correctly identifies the smiling face 4 of 4 or 4 of 5 presentations with Card B.	Does not correctly identify the smiling face 4 of 4 or 4 of 5 presentations with Card B
≥5 years	Correctly identifies the smiling face 4 of 4 or 4 of 5 presentations with both Cards B and C	Does not correctly identify the smiling face 4 of 4 or 4 of 5 presentations with both Cards B and C

6. Optional: Color Vision Deficiency Screening

Notes:

- Color vision deficiency disorders are usually hereditary.
- The early detection of color vision deficiency disorders is important because many classrooms use color-oriented and/or color-coded learning activities and educational supplies.
- A color vision deficiency disorder is not treatable.
- Awareness of color vision deficiency disorders is helpful for parents and teachers to make accommodations for the home and classroom, if required.
- Awareness of color vision deficiency disorders can help students choose careers that do not rely on normal color vision.
- Use paintbrush or cotton-tipped swab for tracing; oil from fingertips will desaturate colors.
- When not in use, store color vision deficiency screening books in a dark area (e.g., cabinet drawer).
- Color vision deficiency screening books should be replaced every 5 to 7 years because colors desaturate over time.

Purpose:

- To check for color vision deficiencies that may interfere with the child's learning.

Screening Location:

- Well-lit room, free from distractions, and with supplemental lighting.
 - To ensure accurate color vision screening results, use natural daylight lamps, such as the Foldi™ LED Lamp, a Color Test Daylight Illuminator, or a Twist Portable Lamp.
 - Do not use lights that give off a yellow tinted illumination.

Equipment Needed:

- Screening tool from 2 options:
 - ColorCheck Complete Vision Screener.
 - HRR Standard Pseudoisochromatic Test, 4th Edition
- Table.
- Chair.
- Paintbrush or cotton-tipped swab for tracing symbols or numbers
- Color Vision Deficiency Screening Results Letter for Parents/Caregivers (Appendix D, Document 7).

Option 1: ColorCheck Complete Vision Screener

Notes:

- Includes LEA SYMBOLS® for young students and LEA NUMBERS® for older students.
- Plates are numbered at the bottom left and upper right corners of each page.
- Plates 19-26 are pediatric symbols to use with children who do not know their numbers.
 - Plate 19 is a demonstration card and all children should be able to identify 3 symbols on the demo plate, regardless of whether a student has a color vision deficiency.
- Plates 1-8 are numbers to use with students who know their numbers.
 - Plate 1 is a demonstration card and all individuals being screened should be able to identify the number on the demo card, regardless of whether a color vision deficiency is present.
- Plates 9-15 are optional and used for additional screening.
- Plate 16 is optional and screens for severity of color vision deficiency.
- Plates 17 and 18 are optional to help screen for the tritanopia type of color vision deficiency (confusing blue with green and yellow with violet).
- Store the cards in a dark drawer when not in use.



Procedure:

- Hold plates 24-30 inches from the face and at a right angle to the child's line of sight.
- Allow 3 seconds for the child to identify each plate.
 - Hesitation is an indication the child may have a color vision deficiency.
 - Students may verbally identify the symbols or numbers, or trace symbols or numbers with a small paint brush or cotton swab.

- Do not trace symbols or numbers with fingers; oil from fingertips will desaturate colors.

Color Plates	Pass	Refer or Rescreen Within 6 Months
Pediatric – 19-26	Correctly identifying all symbols on plates 19-26	Incorrectly identifying or not seeing all symbols on plates 19-26
Number – 1-8	Correctly identifying all numbers on plates 1-8	Incorrectly identifying or not seeing all numbers on plates 1-8

Option 2: HRR Standard Pseudoisochromatic Test, 4th Edition

Notes:

- Includes 24 plates.
 - 4 demonstration plates.
 - 6 screening plates.
 - 14 diagnostic plates.
- Use the 4 demonstration and 6 screening plates for color vision deficiency screening.



Procedure:

- Show the first 4 plates to the child demonstrating how the screening tool works.
- Starting with the first of the 6 screening plates:
 - Hold plates 24-30 inches from the child's face at a right angle to the line of sight.
 - Allow 3 seconds for the child to identify each plate.
 - Hesitation is an indication that the child may have a color vision deficiency.
- Students may verbally identify the symbols, or trace symbols with a small paint brush or cotton swab.
 - Do not trace the numbers or symbol plates with fingers; oil from fingertips will desaturate colors.

Plates	Pass	Refer or Rescreen Within 6 Months
4 Demonstration plates	Correctly identifying 4 demonstration plates	Incorrectly identifying symbols on 4 demonstration plates
6 Screening plates	Correctly identifying all symbols on 6 screening plates	Incorrectly identifying or not seeing all symbols on 6 screening plates

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Appendices

Appendix A – Summary of Vision Screening

1. Ages at Which Vision Screening Should Occur

No national guideline exists mandating ages at which vision screening should occur at school. Currently, Kansas legislation requires screening every 2 years.

The American Academy of Pediatrics and Bright Futures have a Periodicity Schedule recommending ages at which vision screening should occur during well-child visits in the medical home (Bright Futures/American Academy of Pediatrics, 2017).

For these guidelines, with regard to **birth up through age 5**, vision screening should occur minimally no less than 1 time from birth to 1st birthday and ages 1, 2, 3, 4 and 5 years.



School nurses could use the Periodicity Schedule as a template for determining when to screen at school for students ages 6 through 15 years. Recommended ages for screening **school age children** are as follows:




- 6 years,
- 8 years,
- 10 years,
- 12 years, and
- 15 years.


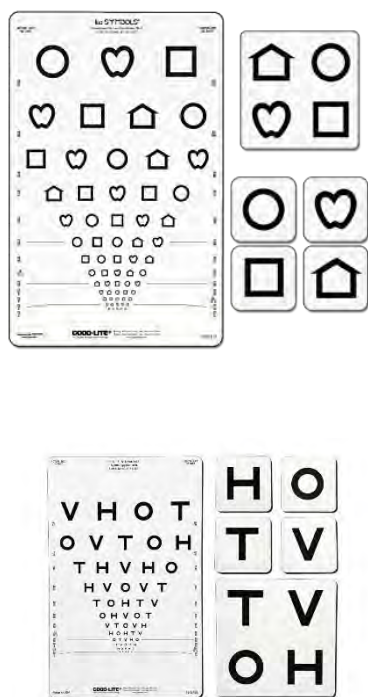
2. Kansas Vision Screening Matrix with Procedures and Ages




Page(s) in Guide	Vision Screening Procedure	Birth to 1 year	1 and 2 years	3, 4, and 5 years	6 to 21 years
32	Family History	✓	✓		
32	Medical Risk Factors	✓	✓		
33	External Observations	✓	✓		
34	Visual Developmental Milestones	✓			
35	Fixate	✓ ≥ 3 months	No if doing instrument- based screening		
35	Eye Tracking (Follow)	✓ ≥ 3 months	No if doing instrument- based screening		
36	Pupillary Reflex	✓ ≥ 6 months	No if doing instrument- based screening		
37	Corneal Light Reflection (Hirschberg Test)	✓ ≥ 6 months	No if doing instrument- based screening		
40 & 62	ABCs of Vision (checklist)			✓	✓
41 & 63	Distance Visual Acuity (<i>threshold or critical line format charts, or computer software</i>)			✓ State required	✓ State required
53 & 69	Near Visual Acuity (<i>monocular threshold or binocular critical line formats</i>)			✓ Optional	✓ Optional
38, 56, & 72	Instrument-Based Screening		✓	✓ Option to distance and near visual acuity screening	<u>Only</u> if student cannot do optotype-based screening
57 & 74	Stereoacuity Screening			✓ If doing optotype- based screening No – If doing instrument- based screening	✓ Upon initial entry into school district No – if doing instrument-based screening on students unable to do optotype- based screening
59 & 76	Color Vision Deficiency Screening			✓ Optional	✓ Optional

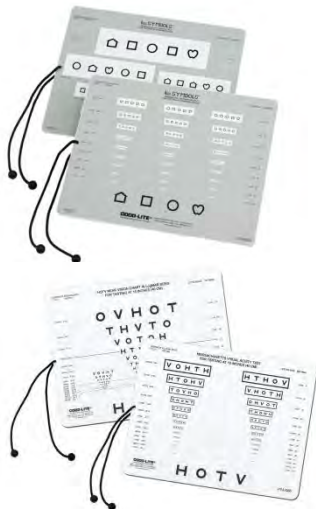


3. Summary of Vision Screening Procedures and Referral Criteria




Age	Type	Procedure or Tool	Referral
All	Family history and External Observation	Pre-Screening	Refer for any risk factor, missed vision development milestone, or appearance, behavior concerns, or complaints.
3 months to 3 years	External Observation	Fixate	Does not fixate on object or fixates with one eye only. Eye drifting is abnormal.
3 months to 3 years	External Observation	Tracking	Eyes do not follow in unison or tracking is jerky or not present.
6 months to 3 years	External Observation	Pupillary Reflex	Either pupil dilates when light is shined on eye, remains the same in light and dark conditions, or pupil reaction to light is sluggish, jerky, or asymmetrical.
6 months to 3 years	External Observation	Corneal Light Reflection (Hirschberg Test)	Reflected light appears to be near the center of the pupil of one eye and displaced nasally, temporally, or vertically away from the pupil in the second eye.
12 months to 6 years ≥6 years ONLY if student cannot do optotype-based screening	Instrument-Based Screening Tool Choice 1	Welch Allyn® Spot™ Vision Screener 	Instrument results on screen indicate when an eye examination is recommended.
12 months to 6 years ≥6 years ONLY if student cannot do optotype-based screening	Instrument-Based Screening Tool Choice 2	Plusoptix S12C Vision Screener 	Instrument results on screen indicate when an eye examination is recommended.

Age	Type	Procedure or Tool	Referral
3, 4, and 5 years	Distance Visual Acuity Screening Tool Choice 1	EyE Check Screener with LEA SYMBOLS® (5 feet) 	Refer (or rescreen the same day, as soon as possible, or no later than 6 months) = Correct identification of only 0, 1, or 2 symbols with either or both eyes.
3, 4, 5, and 6 years	Distance Visual Acuity Screening Tool Choice 2	Sight Line Kit (10 feet) 	Refer (or rescreen the same day, as soon as possible, or no later than 6 months) = Correct identification of only 0, 1, or 2 symbols with either or both eyes.
3 years to 21 years	Distance Visual Acuity Screening Tool Choice 3 Both threshold and critical line formats in same kit.	AAPOS Basic Vision Screening Kit (threshold format – 10 feet) 	Refer (or rescreen no later than age 6 months) = <ul style="list-style-type: none"> • 3 years - Missing 3 or more symbols on the 20/50 line, or any line above the 20/50 line, with either eye. • 4 years - Missing 3 or more symbols on the 20/40 line, or any line above the 20/40 line, with either eye. • ≥5 years - Missing 3 or more symbols on the 20/32 line, or any line above the 20/32 line, with either eye. • All ages - Two-line difference between the eyes, even within the passing range – e.g., 10/10 (20/20) and 10/16 (20/32).

Age	Type	Procedure or Tool	Referral
3 years to 21 years	Distance Visual Acuity Screening Tool Choice 3 Both threshold and critical line formats in same kit.	AAPOS Basic Vision Screening Kit (<i>critical line format – 10 feet</i>) 	Refer (or rescreen no later than age 6 months) = <ul style="list-style-type: none"> • 3 years - Missing 3 or more symbols on the 20/50 line with either eye. • 4 years - Missing 3 or more symbols on the 20/40 line with either eye. • ≥5 years - Missing 3 or more symbols on the 20/32 line with either eye.
3, 4, and 5 years, or until children can identify letters out of sequence, and, then, switch to a Sloan Letters chart	Distance Visual Acuity Screening Tool Choices 4 and 5	LEA SYMBOLS® or HOTV Proportionally Spaced Charts (10 feet) 	Refer (or rescreen no later than age 6 months) = <ul style="list-style-type: none"> • 3 years - Missing 3 or more symbols on the 20/50 line, or any line above the 20/50 line, with either eye. • 4 years - Missing 3 or more symbols on the 20/40 line, or any line above the 20/40 line, with either eye. • ≥5 years - Missing 3 or more symbols on the 20/32 line, or any line above the 20/32 line, with either eye. <p>All ages - Two-line difference between the eyes, even within the passing range – e.g., 10/10 (20/20) and 10/16 (20/32).</p>

Age	Type	Procedure or Tool	Referral
3 years to 21 years	Distance Visual Acuity Screening Choice 6 Optional color vision deficiency and stereoacuity screening available	EyeSpy 20/20™ Computerized Vision Screening (10 feet) 	Software automatically captures screening results and determines when eye examination referrals should occur.
6 years to 21 years (when children can identify letters out of sequence)	Distance Visual Acuity Screening Choice 1 in this format for this age group.	Sloan Letters Proportionally Spaced logMAR Chart (10 feet) 	Refer (or rescreen no later than age 6 months) = <ul style="list-style-type: none"> Missing 3 or more symbols on the 20/32 line, or any line above the 20/32 line, with either eye. Two-line difference between the eyes, even within the passing range – e.g., 10/10 (20/20) and 10/16 (20/32).
3, 4, and 5 years, or until children can identify letters out of sequence, and, then, switch to a Sloan Letters chart	Near Visual Acuity Screening – Monocular Threshold Choices 1 and 2 Can do both threshold and critical line screening with either tool.	LEA SYMBOLS® or HOTV Near Chart (Monocular threshold format – 16 inches) 	Refer (or rescreen no later than age 6 months) = <ul style="list-style-type: none"> 3 years - Missing 3 or more optotypes on the 20/50 line, or any line above the 20/50 line, with either eye. 4 years - Missing 3 or more optotypes on the 20/40 line, or any line above the 20/40 line, with either eye. ≥5 years - Missing 3 or more optotypes on the 20/32 line, or any line above the 20/32 line, with either eye.

Age	Type	Procedure or Tool	Referral
3, 4, and 5 years, or until children can identify letters out of sequence, and, then, switch to a Sloan Letters chart	<p>Near Visual Acuity Screening – Binocular Critical Line</p> <p>Choices 1 and 2</p> <p>Can do both threshold and critical line screening with either tool.</p>	<p>LEA SYMBOLS® or HOTV Near Chart (Binocular critical line format – 16 inches)</p> 	<p>Refer (or rescreen no later than age 6 months) =</p> <ul style="list-style-type: none"> • 3 years - Missing 3 or more optotypes on the 20/50 line. • 4 years - Missing 3 or more optotypes on the 20/40 line. • ≥5 years - Missing 3 or more optotypes on the 20/32 line.
6 years to 21 years (when children can identify letters out of sequence)	<p>Near Visual Acuity Screening – Monocular Threshold</p> <p>Choice 1</p> <p>Can use for threshold or critical line screening.</p>	<p>Sloan Letters (Monocular threshold format – 16 inches)</p> 	<p>Refer (or rescreen no later than age 6 months) =</p> <ul style="list-style-type: none"> • ≥5 years - Missing 3 or more optotypes on the 20/32 line, or any line above the 20/32 line, with either eye.
6 years to 21 years (when children can identify letters out of sequence)	<p>Near Visual Acuity Screening – Binocular Critical Line</p> <p>Choice 1</p> <p>Can use for threshold or critical line screening.</p>	<p>Sloan Letters (Binocular critical line format – 16 inches)</p> 	<p>Refer (or rescreen no later than age 6 months) =</p> <ul style="list-style-type: none"> • ≥5 years - Missing 3 or more optotypes on the 20/32 line.





Age	Type	Procedure or Tool	Referral
3 years to 21 years	Stereoacuity Screening	PASS TEST 2 – Preschool Assessment of Stereopsis with a Smile (16 inches) 	Refer (or rescreen no later than age 6 months) = <ul style="list-style-type: none"> • 3 and 4 years – Does not correctly identify the smiling face of 4 of 4 or 4 of 5 presentations with Card B. • ≥5 years – Does not correctly identify the smiling face of 4 of 4 or 4 of 5 presentations with both Cards B and C.
3 years to 21 years	<u>Optional:</u> Color Vision Deficiency Screening Choice 1	ColorCheck Complete Vision Screener 	Refer (or rescreen no later than age 6 months) = <ul style="list-style-type: none"> • Incorrectly identifying all symbols on plates 19-26 for students who do not know their numbers. • Incorrectly identifying all numbers on plates 1-8 for students who know their numbers.
3 years to 21 years	<u>Optional:</u> Color Vision Deficiency Screening Choice 2	<u>Optional:</u> Color Vision Deficiency Screening HRR Standard Pseudoisochromatic Test, 4 th Edition 	Refer (or rescreen no later than age 6 months) = <ul style="list-style-type: none"> • Incorrectly identifying or not seeing all symbols on 4 demo and 6 screening plates

Appendix B – Recommended Vision Screening Tools

States, and even separate school districts within states, have varying vision screening procedures and protocols. The following information provides recommendations from currently available evidence-based sources, including the National Expert Panel to the National Center for Children's Vision and Eye Health, Prevent Blindness, and Bright Futures.





OPTOTYPE-BASED SCREENING APPROACH

TEST	AGES	TOOLS	OPTOTYPES	PASS	NOTES
Distance	3, 4, 5, and 6 years old	<p>Tests of visual acuity:</p> <ul style="list-style-type: none"> Single, surrounded optotypes in wheels or flip charts at 5 feet.  Flip charts with crowded lines of 5 optotypes per page at 10 feet in critical line or full threshold formats.  Tests of visual acuity screening software with single, surrounded optotypes at 5 or 10 feet.  	<p>LEA SYMBOLS® or HOTV letters</p> 	<p>3yo – 20/50 line</p> <p>4 and 5yo – 20/40 line</p> <p>6yo – 20/32 line</p>	<p>Screen annually.</p> <p>Screening distance is between chart and child's eyes. Place arch of the child's foot on the line when measuring proper distance.</p> <p>Screen one eye at a time.</p> <p>Rescreen – within 6 months with the same screening tool.</p> <p>Refer – to an eye care professional (pediatric optometrist, optometrist, pediatric ophthalmologist, or ophthalmologist) with training and experience examining young children.</p>

 EyeSpy 20/20





OPTOTYPE-BASED SCREENING APPROACH (Continued)

TEST	AGES	TOOLS	OPTOTYPES	PASS	NOTES
Distance	6 years and older	<p>Tests of visual acuity at 10 feet, using standardized format.</p> <p>If you draw a line around the outside of the optotypes, the line will resemble an upside down pyramid and not a rectangle.</p> <p>No more than 5 optotypes per line, unless using a 9" x 14" chart.</p> <p>Test of visual acuity should be 10 feet, not 20 feet, AND should contain 20/32 (10/16) line, not 20/30.</p>	<p>Sloan Letters or LEA NUMBERS®</p>  	Majority of optotypes on 20/32 line with each eye	<p>Bright Futures recommends vision screening for well-child medical visits at ages 8, 10, 12, and 15 years. Screening distance is between chart and child's eyes. Place arch of the child's foot on the line when measuring proper distance.</p> <p>Screen one eye at a time.</p> <p>Rescreen – Within 6 months with the same screening tool.</p> <p>Refer – to an eye care professional (pediatric optometrist, optometrist, pediatric ophthalmologist, or ophthalmologist) with experience examining children.</p>




Instrument-based screening is appropriate for children ages 1 and 2 years, as an alternative to optotype-based screening for ages 3, 4, and 5 years, and ages 6 years and older **only for children who cannot participate** in optotype-based screening. This age range may expand as high quality, peer-reviewed, published research emerges. All individuals, including community groups, screening children ages 6 years and older should follow this guideline until such research emerges.





Donahue, S. P., Baker, C. N., & AAP Committee on Practice and Ambulatory Medicine, AAP Section on Ophthalmology, American Association of Certified Orthoptists, American Association for Pediatric Ophthalmology and Strabismus, American Academy of Ophthalmology (2016). Procedures for the evaluation of the visual system by pediatricians. *Pediatrics*, 137(1), e20153597. Retrieved from <http://pediatrics.aappublications.org/content/pediatrics/early/2015/12/07/peds.2015-3597.full.pdf>

INSTRUMENT-BASED SCREENING APPROACH

TEST	AGES	TOOLS	OPTOTYPES	PASS	NOTES
Estimates of refractive error and eye misalignment	1 year to 6 years old	<p>Allyn Spot™ Vision Screener </p> <p>Welch Allyn SureSight® Vision Screener – Version 2.25 </p> <p>Plusoptix S12C </p> <p>Righton Retinomax </p>	None	According to device settings	<p>Vision screening instruments do not measure visual acuity.</p> <p>Consult local eye care provider for referral criteria settings in programmable devices.</p> <p>Insufficient data currently exists to support instrument-based screening for ages 6 years and older. Monitor the NCCVEH website for additional approved devices.</p> <p>https://nationalcenter.preventblindness.org/instrument-based-vision-screening</p>

RECOMMENDATIONS FOR MISCELLANEOUS MANDATED SCREENING COMPONENTS

TEST	AGES	TOOLS	OPTOTYPES	PASS	NOTES
Near visual acuity	All	<p>Near charts with 16-inch measuring cord.</p>  <p>Sloan Letters near chart with cord.</p>  <p>LEA SYMBOLS near chart with 16-inch measuring cord.</p> 	<p>Ages 3 to 6 years:</p> <p>LEA SYMBOLS® or HOTV letters</p> <p>Ages 6 years and older:</p> <p>Sloan Letters or LEA NUMBERS®</p>	<p>3yo – majority of optotypes on 20/50 line with each eye separately or both eyes open</p> <p>4yo – majority of optotypes on 20/40 line with each eye separately or both eyes open</p> <p>5yo – majority of optotypes on 20/40 line with each eye separately or both eyes open</p> <p>6yo and older – majority of optotypes on 20/32 line with each eye separately or both eyes open</p>	<p>Plus lens testing is <i>not</i> a near visual acuity test.</p> <p>Can screen age/critical line with each eye individually or with both eyes open.</p> <p>Hold cord at child's temple.</p> <p>Ensure cord remains tight to prevent child from moving closer to or farther away from chart.</p>

TEST	AGES	TOOLS	OPTOTYPES	PASS	NOTES
Stereoacuity	All	PASS Test™ 2 	NA	3yo – pass Card B (no testing with Card C) 4yo – pass Card B (no testing with Card C) 5yo and older – pass Cards B and C	If student wears prescription glasses for distance viewing, remove prescription glasses and screen only with polarized glasses. If student wears prescription glasses for near viewing, or full time, place polarized glasses over prescription glasses when screening. you may need a larger set of polarized glasses. If student wears prescription glasses and you do not know the reason, place polarized glasses over prescription glasses when screening. you may need a larger set of polarized glasses. If the child cannot see the 3-D image, then try conducting the test without the child wearing their glasses. Ensure no glare or shadow on cards. Hold cards with edges of fingertips. Tilt cards slightly backward – about a 10-degree tilt.
Color Vision Deficiency Screening	Upon entry to school system	Book with pseudoisochromatic plates 	Symbols and numbers	Follow manufacturer instructions	Replace book every 7 years; colors desaturate over time. Use cotton swab or brush for pointing or tracing the image as oil from fingertips will desaturate colors.
Occluders	3 to 10 years	Adhesive patches, 2-inch wide hypoallergenic surgical tape, or occluder glasses 	NA	NA	<u>Unacceptable</u> occluders include: Tissues, hands, paper or plastic cups, paper occluders, adults holding occluders over child's eyes, and occluder paddles.
Occluders	10 years and older	"Lollypop" or "Mardi Gras mask" occluders 	NA	NA	Hold "Lollypop" occluders with handle toward temple, not chin. <u>Unacceptable</u> occluders include: Tissues, hands, paper or plastic cups, paper occluders, adults holding occluders over child's eyes.

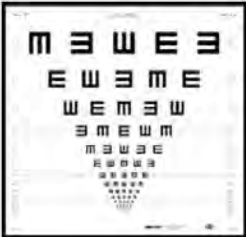
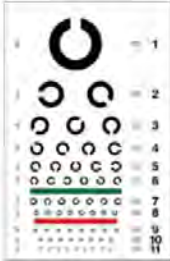


Appendix C – Vision Screening Tools NOT Recommended


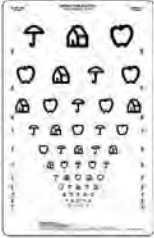





Characteristics of Tests of Recognition Visual Acuity for Screening the Vision of Children Ages 3, 4, and 5 Years Old (36 to <72 Months)

List of optotype-based tests that are **NOT** recommended at any distance for children aged 3, 4, and 5 years.

Chart Name	Image
Sailboat (Kindergarten Chart)	A vertical chart with a sailboat at the top. Below it are various optotypes (geometric shapes) arranged in a grid, including circles, crosses, stars, and triangles, used for visual acuity testing.
Birthday cake (Allen Pictures)	A vertical chart with nine pictures arranged in a 3x3 grid. The pictures include a skull and crossbones, a birthday cake, a group of people, a tree, a car, a telephone, a bird, a house, and a hand.
Allen Pictures as single, isolated optotypes	A horizontal chart showing the same nine pictures from the 'Birthday cake (Allen Pictures)' chart, but each picture is isolated and presented as a single optotype on a white background.

<p>Tumbling E</p>	 <p>A chart for visual acuity testing featuring the letter 'E' in various sizes and orientations (upright, inverted, left-facing, right-facing) arranged in a grid. The chart is used to determine the smallest 'E' that can be correctly identified.</p>
<p>Landolt C</p>	 <p>A chart for visual acuity testing featuring the letter 'C' in various sizes and orientations (upright, inverted, left-facing, right-facing) arranged in a grid. The chart is used to determine the smallest 'C' that can be correctly identified.</p>
<p>Flying crows (Blackbird Wall Chart)</p>	 <p>A chart for visual acuity testing featuring stylized blackbird silhouettes in various sizes and orientations arranged in a grid. The chart is used to determine the smallest blackbird that can be correctly identified.</p>
<p>Sjögren Hand Chart</p>	 <p>A chart for visual acuity testing featuring stylized hand silhouettes in various sizes and orientations arranged in a grid. The chart is used to determine the smallest hand that can be correctly identified.</p>

Wright figures [®]	 <p>A vertical chart of Wright figures, which are complex geometric patterns. The top figure is a large house-like shape, and the others are smaller, more intricate designs arranged in rows of decreasing size.</p>
"House, Apple, Umbrella" (Lighthouse symbols)	 <p>A vertical chart of Lighthouse symbols, which are simple geometric shapes like triangles, circles, and squares, arranged in rows of decreasing size. The symbols are used to test visual discrimination.</p>
Snellen "E" Chart	 <p>A vertical chart of the Snellen "E" chart, featuring the letter 'E' in various sizes and orientations (upright, inverted, left, right) arranged in rows of decreasing size.</p>
Broken Wheel Test	 <p>A chart for the Broken Wheel Test, showing a series of small, broken wheel-like shapes arranged in a grid. The shapes are designed to test visual discrimination and pattern recognition.</p>
Optotypes in Color	 <p>A chart of Optotypes in Color, featuring a variety of colorful geometric shapes and patterns arranged in rows of decreasing size. The colors include red, blue, green, yellow, and black.</p>

Patti Pics Visual Acuity Chart	 A visual acuity chart featuring a grid of various geometric shapes (squares, circles, triangles) arranged in rows, used for testing visual acuity.
Kay Pictures®	 A collection of small, colorful picture cards showing various objects and scenes, used for visual discrimination tests.
Michigan Preschool Test	 A test card featuring a central grid of small squares, surrounded by illustrations of a boy, a girl, a dog, and a cat, used for preschool screening.
Titmus Vision Screening Machine	 A white, handheld vision screening machine with a viewing port and a base, used for quick vision screening.
Optec® Vision Screeners	 A white, handheld vision screening device with a viewing port and a base, used for vision screening.
Keystone Vision Screener	 A small, black and white vision screening device with a viewing port and a base, used for vision screening.

The tests of visual acuity are not acceptable for children aged 36 to <72 months for one or more of the following reasons:

1. Machines prevent observation of the child's face and eyes and insufficient data exist to support using machines in this age group;
2. Charts do not adhere to national and international guidelines for standardized eye chart design;
3. Charts may meet the design standards but the optotypes require orientation and directional cognitive skills that are not yet developed in this targeted age group (i.e., Tumbling E);
4. The optotypes are not equal in discriminability; or
5. Some of the optotypes have a cultural bias and others are outdated, making the pictures not readily recognizable by all children.

National and International Eye Chart Design Guidelines recommend:



1. Optotypes should be of approximate equal legibility.
 2. Each line on an eye chart should have the same number of optotypes.
 3. The horizontal spacing between optotypes should be equal to the width of the optotypes on that line.
 4. The vertical spacing between lines should be the height of the optotypes in the next line down.
 5. The size of optotypes should progress geometrically up or down the chart by 0.1 log units between rows (20/32 vs. 20/30).
 6. Optotypes should be black on a white background under good lighting conditions (luminance between 80 cd/m² and 160 cd/m²).
-


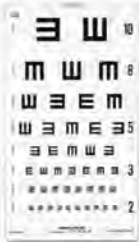
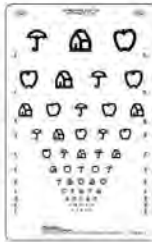
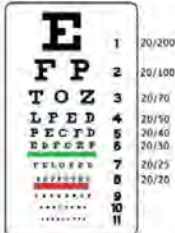
References:

- American National Standards, Inc., (2010). ANSI Z80.21-1992 (R2004). Approved May 27, 2010.
- Candy, T. R., Mishoulam, S. R., Nosofsky, R. M., & Dobson, V. (2011). Adult discrimination performance for pediatric acuity test optotypes. *Investigative Ophthalmology & Visual Science*, 52(7), 4307-4313.
- Committee on Vision. (1980). Recommended standard procedures for the clinical measurement and specification of visual acuity. Report of working group 39. Assembly of Behavioral and Social Sciences, National Research Council, National Academy of Sciences, Washington, DC. *Advances in Ophthalmology*, 41, 103-148.

World Health Organization. (2003). Consultation on development of standards for characterization of vision loss and visual functioning. Retrieved from http://whqlibdoc.who.int/hq/2003/WHO_PBL_03.91.pdf

The joint statement reads, "Although the traditional Snellen chart remains in wide usage, Sloan letter charts present letters in a standardized fashion and should be used for acuity testing if they are available" (Donahue et al., 2016, p. 4).

Chart Name	Image
Sailboat (Kindergarten Chart)	
Birthday cake (Allen Pictures)	

Allen Pictures as single, isolated optotypes	
Tumbling E	
"House, Apple, Umbrella" (Lighthouse symbols)	
Snellen "E" Chart	

References:

Donahue, S. P., & Baker, C. N., AAP Committee on Practice and Ambulatory Medicine, AAP Section on Ophthalmology, American Association of Certified Orthoptists, American Association for Pediatric Ophthalmology and Strabismus, American Academy of Ophthalmology (2016). Procedures for the evaluation of the visual system by pediatricians. *Pediatrics*, 137(1), e20153597. Retrieved from <http://pediatrics.aappublications.org/content/pediatrics/early/2015/12/07/peds.2015-3597.full.pdf>

Appendix D – Letters/Forms

Kansas *tiny-k* Vision Screening Record – Birth to Age 3

v6.30.2018

Screening Professional:

Screening Date:

Family:

Address:

Child's Name:

E-mail:

DOB:

Phone:

1. Family History (parent or sibling)

Check all that apply

- ☐ Strabismus
- ☐ Amblyopia
- ☐ Congenital cataract
- ☐ Congenital glaucoma
- ☐ Retinoblastoma
- ☐ Siblings wearing glasses before age 6 years
- ☐ Parents wore glasses before age 6 years

Medical Risk Factors

Check all that apply

- ☐ Prematurity < 32 weeks
- ☐ Birth weight < 3.3 pounds
- ☐ Needed oxygen > 4 days as a newborn
- ☐ Birth anomaly of head or face
- ☐ Maternal history of infection during pregnancy (e.g. CMV, genital herpes, rubella, syphilis, toxoplasmosis, Zika)
- ☐ Down syndrome
- ☐ Marfan syndrome
- ☐ Hearing Loss
- ☐ Neuropsychological conditions (e.g. cerebral palsy, seizure disorder, hydrocephalus, etc.)

☐ **Pass:** No family history or medical risk factors are checked☐ **Refer:** One or more history or risk factors are checked.

2. External Observations

Yes

- ☐ Cornea (outer covering of eye) is clear?
- ☐ Corneas are the same size without appearing enlarged?
- ☐ Sclerae (white of the eyes) are clear with no redness or unusual spots?
- ☐ Irises are complete circles?
- ☐ Pupils are round and same size?
- ☐ Pupils are black with no white discoloration or cloudiness? (White pupil = urgent referral)
- ☐ Eyelids are not droopy?
- ☐ Eyelids remain open without one eyelid tending to close?
- ☐ Eyelids are free from lumps (e.g. styne)?
- ☐ Eyes and eyelids are free of watering, redness, or crusty matter?
- ☐ Eyes are free of squinting when looking at objects?
- ☐ Eyes are free of frequent blinking?
- ☐ Eyes are steady without unusual eye movements (constant movement or shaking)?

☐ **Pass:** All answers are "yes".☐ **Refer:** One or more answers are not "yes".

Kansas *tiny-k* Vision Screening Record – Birth to Age 3

v6.30.2018

3. Visual Developmental Milestones (2 to 12 months of age)

Infant's age in months: _____

Yes

Greater than 2 months of age:

- ☐ Stable eye contact when awake and alert and initiated by parent or caregiver?

Greater than 4 months of age (all of the above plus):

- ☐ Lively, social smile?
☐ Demonstrates awareness of hands and explore hands with mouth?
☐ Watches hand movements of other children and adults?
☐ Eyes straight and do not constantly drift, wander, or appear to be misaligned? (Eyes constantly appearing misaligned > age 4 months = urgent referral.)

Greater than 7 months of age (all of the above plus):

- ☐ Goal-directed hand/arm movements?

Greater than 9 months of age, all of the above plus:

- ☐ Recognizes family and caregiver faces?
☐ If exposed to books at home, points to individual pictures in a book?
☐ If not exposed to books at home, uses thumb and first finger to pick up objects?

- ☐ **Pass:** All answers are "yes" for age.

- ☐ **Refer:** One or more answers are not "yes".

If performing Instrument-based Screening on child 1 year or older, SKIP tests 4 through 7.

4. Fixate (3 months and up)

Materials Needed: Small Toy

Facing the child at eye level, present a small toy approximately 14 to 16 inches in front of child's nose and observe the child's eyes. Both eyes should be directed toward the object for at least two (2) seconds. It is acceptable to use noise at the start of the test to gain attention, however do not provide continuous sound stimulation to keep attention.

- ☐ **Pass:** Child fixes on object with both eyes for at least 2 seconds.
☐ **Rescreen or Refer:** Child does not fixate on object or fixates with one eye only. Eye drifting is abnormal.

5. Eye Tracking (3 months and up)

Materials Needed: Small Toy/or Penlight

Position a toy or light about 14 to 16 inches from the child's eyes. Move the object to get the child's attention and let him look at it for 2-3 seconds. Slowly move the object in an arc first to the far left, then to the far right, returning to the center point, to observe horizontal tracking. Then slowly move the object in an arc up to several inches above the child's head, and then down below his chin several inches to observe vertical tracking.

Record Results

Horizontal: ☐ Smooth ☐ Jerky ☐ Not Present Vertical: ☐ Smooth ☐ Jerky ☐ Not Present

- ☐ **Pass:** Smooth Tracking

- ☐ **Rescreen or Refer:** Eyes do not follow in unison or tracking is jerky or not present

Kansas *tiny-k* Vision Screening Record – Birth to Age 3

v6.30.2018

6. Pupillary Reflex (6 months and up)

Materials Needed: Penlight & Object in Room

Dim the room lights.

- 1) *Facing the child at eye level hold the penlight in “off” position directly in front of the right eye about 3” away. Direct the child’s attention to a toy/object that is stationed away from the penlight. While the penlight is off, observe the size and shape of the pupils (should be round and equal in size).*
- 2) *Turn the penlight on, shining it directly into the right eye, and watch to see if the pupil size in both eyes quickly decreases in size (constricts).*
- 3) *Move the penlight away from the eyes and watch for an increase in pupil size in both eyes (dilates).*
- 4) *Shine the penlight directly into the left eye, and watch to see if the pupil size in both eyes quickly decreases in size (constricts).*
- 5) *Shine the penlight in the right eye again and observe the pupil size. It should remain small. Repeat the swinging motion of the penlight between each eye 2-3 times.*

*Pupils should be round, black, and equal in size. They should change size, by getting smaller with light and larger in a darkened room. Seizure medications, neurological problems, & other medications can inhibit this response. **Both eyes should react equally to changes in light at the same time.***

Record Results

Right Eye: Response to light: ☐ Absent ☐ Sluggish ☐ Quick
 Round, black and equal in size to left eye? ☐ YES ☐ NO

Left Eye: Response to light: ☐ Absent ☐ Sluggish ☐ Quick
 Round, black and equal in size to right eye? ☐ YES ☐ NO

☐ **Pass:** Both pupils constrict quickly and are round, black and equal in size

☐ **Rescreen or Refer:** Absent or sluggish response to light in either eye or either pupil is not round/black/equal in size.

7. Corneal Light Reflection (Hirschberg) (6 months and up) **Materials Needed:** Small Toy/Penlight

Use normal or lower light levels in the room. Facing the child, position yourself so that your line of vision, the penlight, and the small toy are level with the child’s eyes. The penlight and toy should be 14”-18” from the child’s head. Use the toy to gain attention, then with the light off, place the penlight directly on top of the toy. With the penlight resting on the toy, shine the light in-between the child’s eyebrows (not into the eyes). With the child focusing on the toy or light observe how the light is reflected in each pupil. The reflection should be equally centered and appear slightly toward the nose. Sensitivity to light, rapid eye movement, and poor fixation observed during this test are also reasons for referral.

Record Results

- ☐ Centered in BOTH eyes
☐ Equally centered SLIGHTLY nasal in BOTH eyes
☐ Not centered in one or both eyes

☐ **Pass:** Reflected light appears to be in a symmetrical position near the center of the pupil of each eye.

☐ **Rescreen or Refer:** Reflected light appears to be near the center of the pupil of one eye and displaced nasally, outward, or upward from the pupil in the second eye.

Kansas *tiny-k* Vision Screening Record – Birth to Age 3

v6.30.2018

8. Instrument-based Screening (1 year up to 36 months)

Recommended screeners include Plusoptix S12C Vision Screener or Welch Allyn® Spot™ Vision Screener. Monitor this website because the list of approved instruments could change as additional research emerges: <https://nationalcenter.preventblindness.org/instrument-based-vision-screening>

Refer to the operating manual for pass/refer criteria. ***Attach the print out results to this form.***

- ☐ **Pass**
☐ **Refer**

Screening Results/Actions

- ☐ **No further action required at this time. Rescreen annually:**
- No items noted as a concern on assessments 1 through 3 **and**
 - Passed assessments 4 through 7 **or** passed instrument screening
- ☐ **Rescreen within two-weeks** (unless parent prefers referral to appropriate medical professional* for evaluation):
- No items noted as a concern on assessments 1 through 3, **but**
 - **Did not pass** one or more assessments 4 through 7
- ☐ **Refer to appropriate medical professional* for evaluation:**
- One or more items **noted as a concern** on assessments 1 through 3 **and/or**
 - **Instrument screening** indicates referral **and/or**
 - **Parent preference** for referral

**Medical professional includes medical home, ophthalmologist, or optometrist.*

Required Follow-Up

Rescreening date (if applicable):

Staff member responsible for rescreening:

Anticipated medical professional exam date (if applicable):

Staff member assisting/following-up on referral:

Notes:

2. ABCs of Vision Checklist

Check all that apply (Prevent Blindness, 2015).

Appearance Signs

- ☐ Crossed eye or “wall” eye (eye turning in, out, up or down). Eye turn may be continuous or intermittent, particularly when the child is tired.
- ☐ Continually watering eyes.
- ☐ Red-rimmed, encrusted, or swollen eyelids.
- ☐ Cloudiness/haze.
- ☐ Unequal pupil size.
- ☐ Drooping eyelid(s). Ptosis, commonly called drooping eyelid, is observed as the sagging of an upper eyelid to touch or partially cover the pupil of the eye.
- ☐ Sties or infections on eyelids.
- ☐ Presence of white pupil. This can be associated with a rare but serious eye disease. The white pupil may be observed when looking directly at the individual's eyes, or in his or her photograph.
- ☐ Possible eye injury. Watch for eyes that are reddened, bloodshot, blackened, bruised or swollen, or show evidence of lacerations or abrasions.

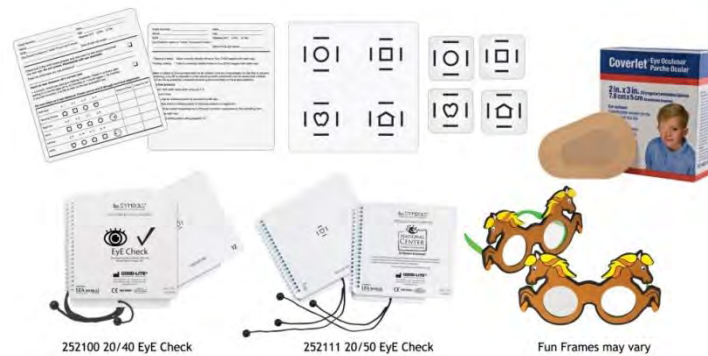
Behavior Signs

- ☐ Body rigid when looking at distant objects.
- ☐ Clumsiness or decreased coordination.
- ☐ Thrusting head forward or backward while looking at distant objects.
- ☐ Tilting head to one side most of the time.
- ☐ Squinting or frowning when trying to focus.
- ☐ Excessive blinking.
- ☐ Closing or covering one eye while doing near work.

Complaint Signs

- ☐ Headaches, nausea, or dizziness.
- ☐ Blurred or double vision.
- ☐ Burning, scratchy, or itchy eyes.
- ☐ Sees blur when looking up after close work or when looking at whiteboard.
- ☐ Unusual sensitivity to light.















3. Recording Form - Eye Check Screener with LEA SYMBOLS® - 20/50 Flipbook for 3 year olds



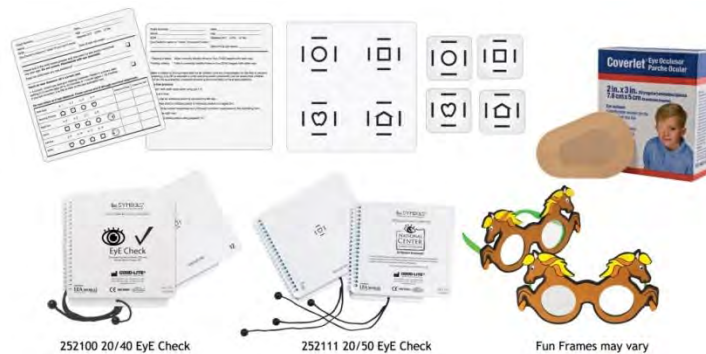
Child's Name:	DOB:	Age:
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Mark screening results in the box below (refer to inside flipbook cover for screening instructions).

- Circle correct responses and mark an "X" through incorrect responses.
 - PASS** = Correct identification of 3 or 4 symbols with each eye.
 - FAIL** = Correct identification of only 0, 1, or 2 symbols with either or both eyes.
- If child cannot identify 3 or 4 symbols with each eye on flipbook cards 5 through 12 at 5 feet (1.5 meters), rescreen on the same day, or as soon as possible, but no later than 6 months from the first screening attempt. If a rescreen is not possible, it is appropriate to refer the child to an eye care provider now.

Both Eyes	Card 1	Card 2	Card 3	Card 4	Check for Pass	Check for Fail
Teaching Optotypes						
Right Eye 	Card 5	Card 6	Card 7	Card 8		
20/50						
Left Eye 	Card 9	Card 10	Card 11	Card 12		
20/50						

4. Recording Form - Eye Check Screener with LEA SYMBOLS® - 20/40 Flipbook for 4 and 5 year olds



Child's Name:	DOB:	Age:
---------------	------	------

Mark screening results in the box below (refer to inside flipbook cover for screening instructions).

- Circle correct responses and mark an "X" through incorrect responses.
 - **PASS** = Correct identification of 3 or 4 symbols with each eye.
 - **FAIL** = Correct identification of only 0, 1, or 2 symbols with either or both eyes.
- If child cannot identify 3 or 4 symbols with each eye on flipbook cards 5 through 12 at 5 feet (1.5 meters), rescreen on the same day, or as soon as possible, but no later than 6 months from the first screening attempt. If a rescreen is not possible, it is appropriate to refer the child to an eye care provider now.

Both Eyes	Card 1	Card 2	Card 3	Card 4	Check for Pass	Check for Fail
Teaching Optotypes						
Right Eye	Card 5	Card 6	Card 7	Card 8		
20/40						
Left Eye	Card 9	Card 10	Card 11	Card 12		
20/40						

5. Vision Screening Parent Information Letter

[School Letterhead]

Date: _____

To: Parent(s)/Guardian(s)

Vision screenings will be administered on _____ to children in grades _____.

Vision screening **does not** replace a complete vision exam conducted by an eye care professional (optometrist or ophthalmologist). If your child has been seen by an optometrist or ophthalmologist this school year, please obtain a copy of the results to share with the school.

Why is it important for schools to provide vision screening?

Children with vision problems may not know they are having trouble seeing. Without early detection and treatment, children's vision problems can lead to permanent vision loss and learning difficulties.

Vision screening will consist of one or more of the following:

1. Distance visual acuity - ability to see objects/print far away
2. Binocular vision - how well the eyes work together
3. Color vision - ability to see colors
4. Near visual acuity - ability to see objects/print up close
5. Instrument-based screening – provides *estimates* of seeing objects far away and close, blurred vision, unequal vision between the two eyes, and eye misalignment

How will the results be shared?

[If your school has a system for notifying the parents of students who pass vision screenings, inform parents here, e.g. "If your child passes the vision screening, you will be notified by email within a few days of the screening."]

If your child does not pass the vision screening, the school nurse or other staff members will contact you to share the results and may make a recommendation for further evaluation by an eye care professional.

If you have any questions about the school vision screening program, please call the school nurse or school contact person. Also, if you have concerns about your student's eye health or academic progress, a complete examination by an eye care professional is highly recommended.

School Nurse or Screening Contact Person

Phone/Fax/Email

6. School Vision Screening Referral Letter

[School Letterhead]

Kansas School Vision Screening Referral to an Eye Care Professional

Student's Name _____ Date _____

School _____ Grade _____

Dear Parent/Guardian:

Your child's vision was recently screened at school to identify if he/she might have a vision problem or might be at risk for vision problems. The results of the screening indicate the need for an eye examination by an eye care professional. The findings from the screening are recorded on the top of the attached referral form. The bottom of the referral form is to be completed by your child's eye care professional (optometrist or ophthalmologist).

It is important to complete this referral soon, as uncorrected vision problems can affect learning. Even when a child has no complaints, he/she may be experiencing vision problems.

- Let us know if your child is already receiving eye care from an eye care professional, and provide the date he/she was last examined.
- **Let us know if you need help finding a local eye care professional.** Services may be available for those unable to pay.
- Please take the attached form with you when you take your child to the eye care professional.
- Sign the "**Release of Information**" on the bottom left of the attached form.
- Have your child's eye care professional complete the form.
- **Please return the completed form to the school nurse or school contact.**

Sincerely,

School Nurse or School Contact

Phone Number/Email

7. Kansas Vision Screening Referral & Eye Care Professional Report

(Return completed report to school health clinic or nurse)

Child's Name:	Date of Birth:	Date of Referral:
School:	Grade:	
Met referral criteria (check applicable boxes): <input type="checkbox"/> With Glasses/Contacts <input type="checkbox"/> Without Correction <input type="checkbox"/> Unable to Screen <input type="checkbox"/> Based on Observation. Provide Symptoms/Concerns: <input type="checkbox"/> Distance Visual Acuity <input type="checkbox"/> R <input type="checkbox"/> L Circle screening tool/distance: Sloan Chart, LEA Symbols, HOTV Symbols, Chart 5 or 10 feet <input type="checkbox"/> Near Visual Acuity <input type="checkbox"/> R <input type="checkbox"/> L (or) if Near Binocular Testing <input type="checkbox"/> Both <input type="checkbox"/> Stereopsis (PASS 2)		
Instrument Screening (screener may attach instrument report): <input type="checkbox"/> With Glasses/Contacts <input type="checkbox"/> Without Correction Circle Instrument (WA Spot™ / Plusoptix S12C / WA SureSight 2.25) Met referral criteria: <input type="checkbox"/> R <input type="checkbox"/> L		

Eye Care Professional Findings

Date of Exam: _____ <input type="checkbox"/> Normal	Without Correction R _____ L _____	With Current Prescription R _____ L _____	With New Prescription R _____ L _____
Summary of vision problem & diagnosis: <input type="checkbox"/> Hyperopia: Indicate eye R _____ L _____ <input type="checkbox"/> Myopia: Indicate eye? R _____ L _____ <input type="checkbox"/> Astigmatism: Indicate eye R _____ L _____ <input type="checkbox"/> Amblyopia: Indicate eye R _____ L _____ <input type="checkbox"/> Eye Alignment: Indicate eye? R _____ L _____ Esophoria / Esotropia / Exophoria / Exotropia / Other <input type="checkbox"/> Binocularity (Stereovision, Near Point of Convergence): _____ <input type="checkbox"/> Other Ocular Conditions or Neurological/ Cortical Vision Impairment – Explain: _____			
Recommendations & Treatment: Glasses Prescribed: <input type="checkbox"/> No <input type="checkbox"/> Yes ➡ <input type="checkbox"/> Constant Wear <input type="checkbox"/> Near Vision Only <input type="checkbox"/> Far Vision Only <input type="checkbox"/> May Remove for Physical Education <input type="checkbox"/> Glasses Other _____ <input type="checkbox"/> Contact Lenses _____ <input type="checkbox"/> Medical /Surgical Treatment (e.g., patching, Atropine drops, etc.) _____			
Additional Instructions for Teachers - Upon completion of any needed eye care treatment, I expect there will be: <input type="checkbox"/> No significant visual problems that may interfere with learning. <input type="checkbox"/> Visual problems/impairment that may interfere with learning. Explain (see below): _____ <input type="checkbox"/> Preferential seating <input type="checkbox"/> Low vision evaluation <input type="checkbox"/> Assistive technology <input type="checkbox"/> Lighting conditions <input type="checkbox"/> Other: _____ <input type="checkbox"/> Currently receives services through local Teacher of Students who are Blind or Visually Impaired or Kansas State School for the Blind <input type="checkbox"/> If a child has both a vision and hearing loss, refer family to the Kansas Deaf-Blind Project https://www.kansasdeafblind.org			
Next appointment scheduled? <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, when _____			

Consent of Parent or Guardian

I agree to release the above information on my child or ward to appropriate school or health authorities.

Parent or Guardian Signature Date

Send completed report to:
(Place school name, address, fax #, etc. here.)

Eye Care Professional

Signature

Date

Printed Name

Address

City

State

Zip

Phone Number

This form is intended for the sole use of the intended recipient and may contain privileged, sensitive, or protected health information.

If you are not the intended recipient, be advised that the unauthorized use, disclosure, copying, distribution or action taken reliant on the contents of this communication is prohibited. Document Source: Adapted from Ohio Department of Health Vision Screening Requirements and Guidelines for Preschool and School-Aged Children, 2017

8. School Color Vision Screening Results Letter

[School Letterhead]

Kansas School Color Vision Screening Results

Date: _____

To: Parent(s)/Guardian of _____

The result of your child's color vision screening indicates that he/she is having difficulty in telling between certain colors.

During the early years of school, the use of colors with learning concepts in math and other subjects is sometimes a problem for children with color vision concerns. As your child gets older, career choices may require his/her ability to correctly identify colors.

An eye exam, by an Eye Care Professional (optometrist/ophthalmologist), can confirm if your child has color vision concerns.

Accommodations for this can easily be made. Schools are required to do so by federal law if there is a properly documented diagnosis. The following website provides information and advice to parents as well as to teachers in areas such as formal diagnosis for color blindness and how to support students in the classroom and in sports: <http://www.colourblindawareness.org/>

If you have any questions or need help in anyway, please contact:

Screening (Contact Person)

Phone/FAX/email

9. Eye Care Professional Referral Follow-Up

[School Letterhead]

Kansas School Vision Screening Eye Care Professional Referral Follow-Up

Date: _____ **To the Parent(s)/Guardian of:** _____

Earlier in the school year, a vision referral letter was sent home with an attached **Eye Care Professional Report** form to be completed by an optometrist or ophthalmologist. The purpose of this letter is to determine the results of the referral.

Please check a statement(s) below regarding your child's referral:

_____ The form has been lost. Please send another one.

_____ No appointment was made.

_____ We do not have vision insurance; please send information on possible financial vision assistance for eye examinations.

_____ We do have vision insurance; however, please send information on possible financial vision assistance for eye examinations.

_____ An appointment is scheduled on _____ (date). We will bring the Eye Care Professional Report to the school upon completion.

_____ The examination was done. I have notified the _____
(name of eye care professional) and requested they send The Eye Care Professional Report to the school.

_____ Other: _____

If you have any questions or need assistance in scheduling an appointment, please contact:

Screening (Contact Person)

Phone/FAX/email

This area for office use only:

Received by: _____ Date: _____

Appendix E – Vision Education/Resources

Vision Screening and Examinations

All About Vision

Provides free eye exams and glasses for individuals including infants, students, and adults as well as discussing eye services available through Medicaid, the Child Health Insurance Program, and Medicare.

For more information, visit:

<https://www.allaboutvision.com/eye-exam/free-exam.htm>

Infant See® Program

InfantSEE®, a public health program, managed by Optometry Cares® - the American Optometric Association Foundation, is designed to ensure that eye and vision care becomes an essential part of infant wellness care to improve a child's quality of life. Under this program, participating optometrists provide a comprehensive infant eye assessment between 6 and 12 months of age as a no-cost public service.

For more information, visit:

<http://www.infantsee.org/>

KanLovKids

The KanLovKids Project offers Low Vision Collaborative Clinics for children able to read an eye chart with letters, numbers, or pictures and tell the doctor what they see, and Low Vision Collaborative Clinic+ for infants, toddlers, & school-aged children with alternative communication and complex learning needs. All services are supplementary to the child/student's primary eye care provided by their local ophthalmologist and/or optometrist.

For more information, visit:

<http://kanlovkids.kssdb.org>

Kansas City Free Eye Clinic

Assists low-income and homeless individuals in the metro area with access to preventive eye exams and glasses

For more information, visit:

<https://www.kcfreeeyeclinic.org>
contactus@KCFreeEyeClinic.org

Kansas Lions Sight Foundation and Lions Clubs

Local clubs offer help for vision services such as eye exams, glasses, vision screenings, and eyeglass recycling. Clubs also provide health programs to control and prevent diabetes and diabetic retinopathy, the leading cause of vision loss among working adults.

For more information, visit:

<https://kansaslions.org/>

Kansas Optometric Association

KOA Low Vision Committee members are available to assist with questions from members at any time. In addition, the Low Vision Committee has a presentation on Low Vision Care available for use by any KOA member. The Committee also has a speakers' bureau that can be called upon for events across the state. For a listing of optometrists who specialize in low vision, visit the website and click on Resources for the Low Vision Resource Guide.

For more information, visit:

<http://www.kansasoptometric.org/>

Local Health Departments

Agencies that provide health care services and referrals to the local/county/city communities.

For more information, visit:

[KDHE Health Directory](#)

Medical Service Bureau

Refers Sedgwick county clients to local optometrists for low-cost eye exams after determining the co-pay amount for the client. Clients then pay the optometrist for the exam. If the optometrist writes a prescription for glasses, Medical Service Bureau can provide a voucher for the glasses through one of the optical shops working with the agency. If a client already has a current prescription, vouchers are available for glasses. Children 18 years and younger and adults diagnosed with diabetes, hypertension, or a medical eye condition can receive help with an exam and glasses once a year. Otherwise, adults may have exams and/or glasses every 2 years.

For more information, visit:

<https://msbmedlinks.org/>

Prevent Blindness

Prevent Blindness is a national non-profit organization dedicated to preventing blindness and preserving sight for all ages. Prevent Blindness offers a wealth of educational materials including fact sheets, webpages, patient and professional training, and more. Parents and caregivers can access free, downloadable information, financial assistance resources, news, and events.

For more information, visit:

<https://www.preventblindness.org/>

See to Learn Program

See To Learn was developed by the Eye Care Council as a preventive program to help make sure every child's early education is unaffected by vision problems. Through See To Learn, parents can schedule a FREE vision assessment for their 3-year-old child in a participating optometrist's office.

For more information, visit:

<http://seetolearn.com>

<http://seetolearn.com/find-a-doctor/>

Salvation Army

Vision USA provides vouchers for free eye exams and materials through the Salvation Army for people who qualify at one of three Wichita locations.

For more information, visit:

www.optometryscharity.org/vision-usa/

Sight for Students

Sight for Students is a Vision Service Plan (VSP) charity that provides free vision exams and glasses to low-income, uninsured children. The program operates nationally through a network of community partners who identify children in need and VSP network doctors who provide eye care services. Sight for Students vouchers are available to school nurses who are members of the National Association of School Nurses.

For more information, visit:

<https://vspglobal.com/cms/vspglobal-outreach/gift-certificates.html>

https://www.vsp.com/sfs-find-affiliate.html?WT.ad=body_find_a_partner

Vision USA

A program provided by doctors of optometry that provides basic eye health and vision care services free of charge to uninsured, low-income people and to families that do not qualify for government aid or private health care assistance.

For more information, visit:

<http://www.aoafoundation.org/vision-usa/whoiseligible>

Assistive Technology

ABC – Association of Blind Citizens

The Association of Blind Citizens operates the Assistive Technology Fund. The Assistive Technology Fund (ATF) will provide funds to cover 50% of the retail price of adaptive devices or software. The products covered by this program must retail for a minimum of \$200 with a maximum retail price of \$6,000. Persons eligible to apply for assistance must have a family income of less than \$50,000 and cash assets of less than \$20,000.

For more information, visit:

https://www.blindcitizens.org/assistive_tech.htm

Assistive Technology for Kansans

The statewide program serves Kansans in all 105 counties. Customers include seniors, infants and toddlers, students, working age adults, farmers with disabilities, active duty soldiers and veterans with disabilities, individuals with vision and hearing loss, and other persons with disabilities and chronic health conditions. ATK provides technology solutions in the areas of vision, hearing, speech communications, learning, cognition, mobility, seating, daily living, environmental adaptations, vehicle modifications, computer and related technology, recreation and sports adaptations. Comprehensive AT services include product information, equipment loan, device demonstration, device reuse/recycle, assessment, funding assistance, and training.

For more information, visit:

<http://atk.ku.edu/>

iCanConnect

iCanConnect provides people with both significant vision and hearing loss with free equipment and training. iCanConnect is a national program with local contacts that helps people stay connected with others.

For more information, visit:

<http://www.icanconnect.org/>

Kansas Telecommunication Access Project (TAP)

The Kansas Telecommunications Access Program (TAP) is an equipment distribution program. The purpose of the program is to provide specialized telephones and other telecommunications devices to Kansans with disabilities who cannot use traditional home telephones. Based on a state law, the program receives funds through the Kansas Universal Service Fund (KUSF) and is regulated by the Kansas Corporation Commission (KCC).

For more information, visit:

<https://atk.ku.edu/ks-tap>

Reading Services

Audio-Reader

The Audio-Reader Network is a reading and information service for blind, visually impaired, and print disabled individuals in Kansas and western Missouri. Daily newspapers, magazines, and best-selling books are read on the air and on the internet, 24 hours a day; and automated newspaper readings are available by telephone. Services are offered free of charge to anyone in our listening area who is unable to read normal printed material.

For more information, visit:

<http://reader.ku.edu/>

Kansas Braille Transcription Institute

The Kansas Braille Transcription Institute, Inc. is dedicated to serving the visually impaired through the operation of an innovative Braille transcription center.

For more information, visit:

<http://www.kbti.org/home.html>

Kansas Talking Books

Kansas Talking Books provides personalized library support and materials in a specialized format to eligible Kansas residents to ensure that all may read.

For more information, visit:

<https://kslib.info/153/Talking-Books>

Education for Students who are Blind or Visually Impaired

Kansas Instructional Resource Center for the Blind and Visually Impaired

Serving more than 1000 students annually, the KIRC is a statewide, state funded resource center for students with visual disabilities enrolled in a formal educational program in Kansas' public and private schools.

For more information, visit:

<http://www.kirc.org/>

Kansas State School for the Blind

The Kansas State School for the Blind is a "network of services" for students birth-21 years of age who are blind or visually impaired in Kansas. KSSB provides both direct services to students and technical assistance to schools, teachers, and families via our Field Services and/or Campus programs. Our Field Services department consists of twelve (12) Teacher of Students with Visual Impairments (TSVIs) and/or Certified Orientation and Mobility Specialists (COMS) who are regionally located to serve six regions of our state. The Kansas State School for the Blind also has a special purpose school for students 3-21 years of age who are visually impaired and are referred by their local school district for evaluation at KSSB in consideration of a placement decision. KSSB offers an Early Childhood Program (ages 3-8) as well as a Transition Program for students age 18-21 that allows students to improve independent living skills while pursuing higher education, technical certifications, or developing job skills.

For more information, visit:

<http://www.kssb.net>

Adult Services

Independent Living Services for Blind or Visually Impaired Seniors (age 55+)

Provides a variety of services including skills training, orientation and mobility, assistive devices and techniques for household organization in the home communities of Kansans who are age 55 or older and who experience blindness or visual impairments.

For more information, visit:

<http://www.dcf.ks.gov/services/Pages/MapBVI.aspx>

Robert J. Dole VA Medical Center

The Visual Impairment Services Team (VIST) Coordinators are case managers who have responsibility for the coordination of services for severely disabled visually impaired Veterans and Active Duty Servicemembers. VIST coordinator duties include providing and/or arranging the provision of appropriate treatment in order to enhance functioning such as making referrals to Blind Rehabilitation Centers, Blind Rehabilitation Outpatient Services, VICTORS, VISOR, and low vision clinics. Other VIST coordinator duties include identifying newly identified individuals who have severely disabling visual impairment, providing counseling, problem resolution, arranging a review of benefits and needed services, and conducting educational and outreach programs relating to VIST and blindness.

For more information, visit:

https://www.wichita.va.gov/services/Visual_Impairment_Service_Team_Blind_Rehabilitation.asp

VA Medical Center (Kansas City)

People who lose sight often have problems with different functions of daily life. They may rely on others to help with reading, travel, preparing meals, and many other tasks. Our vision and blind rehabilitation services help people regain their independence. This leads to a better quality of life for the Veterans we serve and their families.

For more information, visit:

https://www.kansascity.va.gov/services/Vision_Impairment_Rehabilitation.asp

Vocational Rehabilitation Services

Empowers Kansans who are blind or visually impaired to achieve competitive, integrated employment.

For more information, visit:

<http://www.dcf.ks.gov/services/Pages/MapVR.aspx>

<http://www.dcf.ks.gov/services/RS/Pages/Employment-Services.aspx>

General Services for People who are Blind or Visually Impaired

Alphapointe

A multi-faceted company with an array of divisions, products, and services serving as the region's leader for vision rehabilitation, education, and advocacy and able to help anyone experiencing vision loss.

For more information, visit:

<https://www.alphapointe.org/>

Colour Blind Awareness

This website provides information on the everyday problems experienced by color blind people and offers advice to parents and caregivers in how to provide support for the color blind

children in their care, including details of how to access tests for color blindness or to arrange for a formal diagnosis. Advice sheet for teachers, [click here](#).

For more information

<http://www.colourblindawareness.org/>

Envision

Provides programs and services to Kansans across the lifespan:

- The Early Childhood Development Center (ECDC) is a daycare center for children who are blind or visually impaired from two weeks to age 5 years. ECDC also provides home-based services to children who have a vision impairment and other health issues that prevent them from attending daycare.
- School-aged kids programs include art programs, support groups, and summer conferences for middle school and high school students.
- PRIDE is a day program for adults with low vision and as well as an intellectual disability.
- The new Workforce Innovation Center is dedicated to providing experiential training and job placement opportunities in desired career fields.
- The Envision Research Institute (ERI) is committed to research that addresses practical issues in the clinical treatment and rehabilitation of persons who have low vision or blindness.
- Envision Vision Rehabilitation Clinic (EVRC) provides comprehensive, multidisciplinary vision rehabilitation by combining adaptive technology, training and more to maximize visual function.
- Envision Everyday store sells adaptive aids, technology, and equipment, visit in person or online at www.envisioneveryday.com.
- Public education program provides presentations to a wide variety of groups throughout the state.

For more information, visit:

<https://www.envisionus.com/>

Families Together

Provides support and information for families of children, from birth to age 26 years, with disabilities and/or special health care needs. Programs are offered at no cost to families, and are available in English and Spanish.

For more information, visit:

<https://famiestogetherinc.org/>

Helen Keller National Center for Deaf-Blind Youths and Adults: Great Plains Region Office

Regional offices bring HKNC resources to you. The regional representative knows all about the programs and services that are available to deaf-blind individuals, their families and service providers in each state and beyond, and can help individuals find and access the ones that are right for them. Whether interested in learning about support services nearby, wanting to take advantage of the technology available through the National Deaf-Blind Equipment Distribution Program (NDBEDP), or wanting to explore the possibility of training at the national headquarters, the regional rep is a link to all that HKNC has to offer – consultation, advocacy, assessment, training, referrals and more.

For more information, visit:

<https://www.helenkeller.org/hknc/great-plains-region>

Kansas Association of the Blind and Visually Impaired

KABVI strives to increase the independence, opportunity, and quality of life for all blind and visually impaired Kansans, and to assist us in taking our rightful place as equals among our sighted peers.

For more information, visit:

<http://www.kabvi.com/index.html>

Kansas Department of Children and Families

Provides a variety of services and programs for people who are blind or visually impaired. The Kansas Advisory Committee for the Blind or Visually Impaired, which is formed under the Department for Children and Families (DCF), has two major priorities: 1) To provide advice and counsel to the Secretary of DCF on issues that improve opportunities for employment and independent living for Kansans who are blind or visually impaired. 2) To serve as an advisory body for DCF and, as such, advise the Secretary and staff of DCF in matters affecting policies, programs, priorities and long-term, strategic direction for the state's services to Kansans who are blind or visually impaired.

For more information, visit:

<http://www.dcf.ks.gov/services/RS/Pages/Blind.aspx>

Kansas Department of Health and Environment: Infant-Toddler Program

Kansas Infant Toddler Services (authorized by the Individuals with Disabilities Education Act - IDEA Part C) is administered by the Kansas Department of Health and Environment (KDHE). KDHE provides grants to [local networks](#) to assist in maintaining and implementing a statewide system of coordinated, comprehensive, multidisciplinary early intervention services for infants and toddlers with disabilities (birth through 2) and their families. KDHE is responsible for assuring availability to eligible children and their families excluding those at-risk.

For more information, visit:

<http://www.kdheks.gov/its/>

Kansas State Department of Education

The purpose of the Early Childhood, Special Education, and Title Services (ECSET) is to provide effective, evidence-based technical assistance to districts and schools across the state. Educational Service Centers provide support and services for an appropriate education for exceptional students in specific regions within Kansas. Special education programs serve students whose unique learning needs cannot be met without additional intervention. These students require specially designed instruction to enable them to progress within the general education environment and/or receive an educational benefit from instruction. [Click here](#) for Service Center listings.

For more information, visit:

<http://www.ksde.org/Agency/Division-of-Learning-Services/Early-Childhood-Special-Education-and-Title-Services>

KSDS Assistance Dogs, Inc.

Provides guide dogs for the visually impaired, service dogs to assist individuals with physical disabilities and facility dogs that assist professionals in the field of education, counseling, healthcare, retirement or the legal system.

For more information, visit:

<http://www.ksds.org/>

Medicaid

Medicaid provides health care coverage to certain individuals with limited income. In Kansas, a person is entitled to free or low-cost (KanCare) Medicaid health care coverage if they meet specific income and eligibility requirements.

For more information, visit:

<http://www.kancare.ks.gov/>

<http://www.kancare.ks.gov/consumers/apply-for-kancare>

Appendix F – Eye Anatomy, Refractive Errors, and Visual Pathway

“Document Source: Ohio Department of Health Vision Screening Requirements and Guidelines for Preschool and School-Aged Children, 2017”

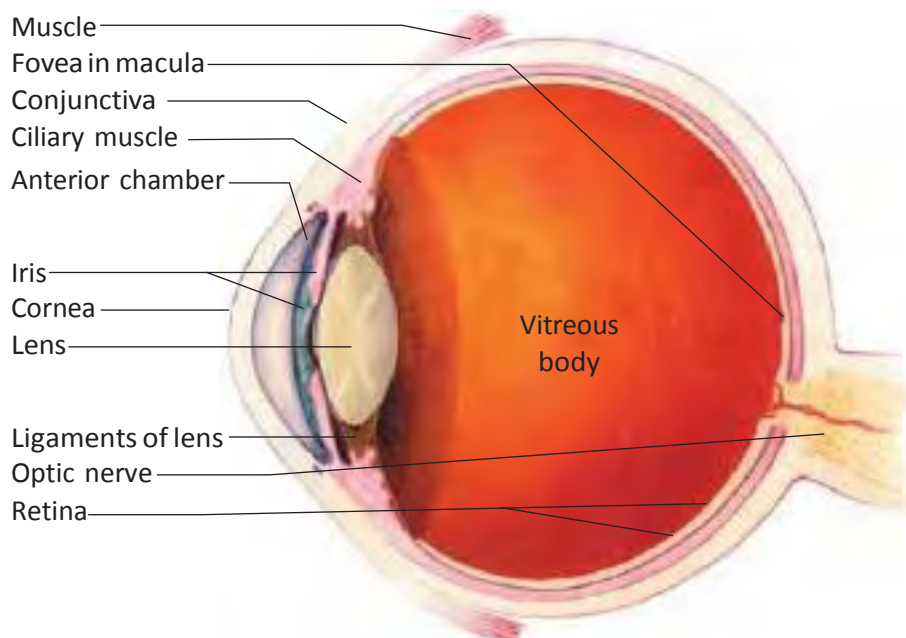
How Normal Vision Develops

Often children cannot tell you how they see. Vision problems may not be obvious. Most vision problems are not painful. Even after looking at children’s eyes, and watching how they act, it may still be difficult to recognize that they have vision problems.

During the early years of life, children learn to use their eyes. At first, babies learn to recognize familiar faces. Next, they begin to figure out how to reach and hold onto things that they see. They look at pictures and start to draw. By the age of four, children may be able to draw and name pictures and to copy shapes and letters. To do these things, children must have usable vision.

Babies who have vision problems may learn to “see” in a way that is different from babies with normal vision. Babies or toddlers with vision problems may need help to learn skills like eating, playing with toys, or naming common things (like a ball, a book, or a shoe). Children who may have vision problems need help during the first years of life.

Without help, children may not be able to “catch-up” later, even if the vision problem is corrected and their vision is normal. Children with vision problems may have trouble with school work. As adults, they may have trouble learning job skills. That is why it is very important to screen the vision of young children to identify vision problems or potential vision problems as early as possible and to help assure children with vision impairments get the special help they need.



For a person to see normally, all parts of this visual system must work. The visual system is not fully developed at birth. An infant with normal vision will not be able to see things as clearly as an adult with normal vision. The baby's eyes do not work together all the time until about four months of age. Pathways carrying signals to the brain, and the brain itself, continue to develop during the early years of life.

As the eye and the visual cortex of the brain develop, a child's ability to see detail improves. As the eyes begin to work together, the brain learns to combine the images from the two eyes into a single image. The child learns how to use the signals in the brain to recognize things, such as faces and toys, and to tell the difference between things that look similar. Vision continues to develop until a child is at least 9 years old.

In order for a person to see, several things must happen:

- 1 The eyes must be able to catch light and send signals to the optic nerve of each eye.
- 2 The optic nerves of each eye must be able to send signals to the brain's visual cortex, the "seeing brain."
- 3 The visual cortex must be able to put together the signals from each eye to create one view of the world.

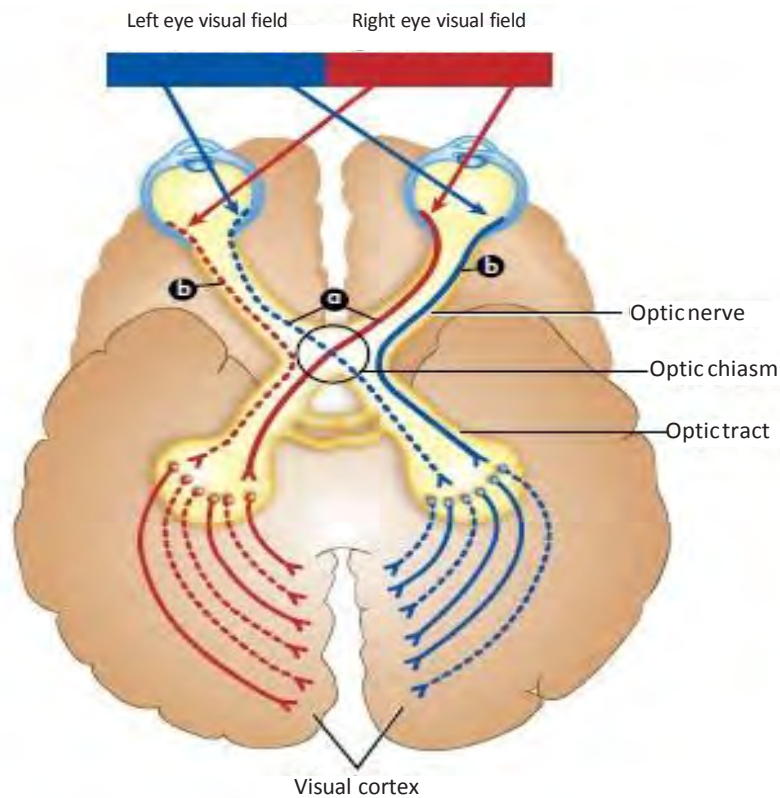


The Visual Pathway

Vision is generated by the retina as information leaves the eye by way of the optic nerve, and there is a partial crossing of nerves at the optic chiasm. From the optic chiasm the nerves are called the optic tracts and synapse at the lateral geniculate nucleus. From there, they travel to the primary visual cortex at the back of the brain.

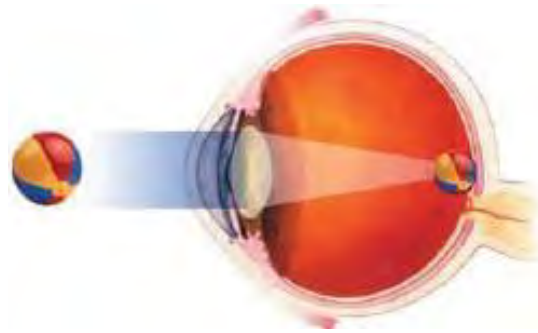
The brain works on a crossed wire system. Each eye is divided into right and left visual fields. Each eye gets information from both visual fields. To ensure that the brain doesn't get extraneous information, the nerves from the retina divide themselves out into separate pathways. The inner visual field retinal nerves (a) cross over at the optic chiasm — whereas the lateral nerves (b) do not cross.

Damaging the visual system before the optic chiasm will affect one eye, both visual fields — analogous to closing one eye. Damaging the pathway after the chiasm, though, will damage parts of both eyes, and only one visual field. If you could imagine, the field of view seen would be only 90°, from straight ahead to one side.



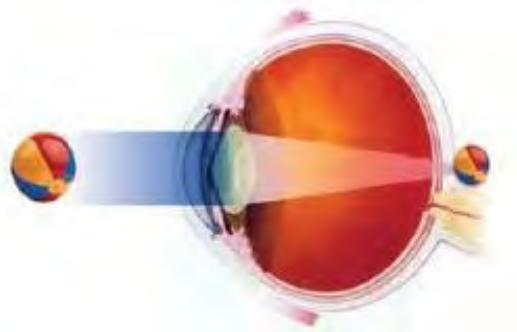
Normal Eye

In a normal eye, light enters our eye through the pupil. The cornea, at the front of our eye, bends the light. The light passes through the lens to the retina. It then focuses on the retina, like a little picture of whatever we are looking at. Nerve cells in the retina send that “picture” to our brain.



Hyperopia - Farsighted

Those with hyperopia see distant objects clearly, but close up objects appear blurry. Farsightedness occurs if your eyeball is too short or the cornea has too little curvature, so light entering your eye is not focused correctly.



Myopia - Nearsighted

Those with myopia see near objects clearly, but far away objects appear blurry. With myopia, the eyeball is too long, or the cornea is too steep, so images are focused in the vitreous inside the eye rather than on the retina at the back of the eye.

Appendix G – Glossary

ACCOMMODATION

The eye's ability to adjust its focus by the action of the ciliary body. This permits the lens of the eye to thicken, increasing its focusing power. Accommodation allows the eye to focus on near objects. As we get older the lens of the eye becomes less flexible and its ability to change focus decreases.

AMBLYOPIA

Loss of vision at the brain level when eyes receive insufficient stimulation during development. Can lead to permanent vision loss if not detected and treated early.

ANISOMETROPIA

A difference of refraction between the two eyes. For example, one eye may be nearsighted and the other eye may be farsighted.

ASTIGMATISM

Distorted vision, typically caused by an abnormally shaped cornea. When the cornea is not perfectly spherical in shape, two different images may be formed in the same eye, creating distorted and blurred vision and producing eyestrain or headaches.

Astigmatism often accompanies myopia and hyperopia and may change gradually over time. Regular astigmatism can be corrected with specially shaped corrective lenses.

Irregular corneal astigmatism can sometimes be corrected with contact lenses.

Astigmatism can also be caused by irregular shape of other structures of the eye, such as the retina or the lens.

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, problem with depth perception, headaches, or loss in visual efficiency and comprehension.

BLIND SPOT

The area on the retina where the optic nerve enters the eyeball. This small area has no visual receptor cells and creates a natural blind spot on the retina. In normal binocular vision, each eye "covers" the other eye's blind spot, producing a full visual field.

CATARACT

Opacity or cloudiness of the crystalline lens that may prevent a clear image from forming on the retina. May be congenital or caused by trauma, disease, and/or age.

CENTRAL VISUAL ACUITY

Ability of the eye to perceive the shape of objects only in the direct line of vision.

CHORIORETINITIS

Inflammation of the choroid and retina.

CHOROID

Major blood vessel layer of the eye between the retina and sclera that provides nourishment to the outer layers of the retina.

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.

CONGENITAL AND PERINATAL CYTOMEGALOVIRUS (CMV)

A viral infection acquired prenatally or perinatally causing many symptoms including chorioretinitis or may be asymptomatic without concerns. Although hearing loss is most common impairment in otherwise asymptomatic neonates vision disturbances can be an eventual symptom.

CONGENITAL RUBELLA

A viral infection acquired by the mother during pregnancy that may cause cataracts and retinopathy.

CONGENITAL SYPHILIS

Prenatal infection transmitted through the placenta to the fetus that can cause optic atrophy sometimes developing blindness.

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.

CONVERGENCE

The simultaneous turning in of both eyes that occurs when viewing an approaching object. An effort to maintain single binocular vision as the object approaches.

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.

CORTICAL VISUAL IMPAIRMENT (CVI)

Temporary or permanent visual impairment caused by disturbance of the posterior visual pathways and/or the occipital lobes of the brain. The degree of vision impairment

can range from severe visual impairment to total blindness. The presence of CVI is not an indicator of the child's cognitive ability.

DEPTH PERCEPTION

The ability to judge distances by interpreting size, shape, shadows, and overlapping images.

DIPLOPIA

The seeing of one object as two.

DIVERGENCE

The simultaneous turning out of both eyes when viewing an object moving away from the eyes.

DOMINANT EYE

The eye that "leads" its partner during eye movements. Humans also have dominant tendencies in hands, feet, and brain halves.

DOWN SYNDROME

A chromosomal condition associated with intellectual disability, cognitive delays, characteristic facial appearance, and increased risk for development of a variety of medical conditions including vision problems. Vision problems include a wide range of visual acuity errors, amblyopia, strabismus, nystagmus, lid anomalies and infections, cataracts, and other various visual concerns.

EMMETROPIA (At rest)

No refractive error when accommodation is at rest. Images of distant objects focus clearly on the retina without accommodation or corrective lenses.

ESOTROPIA (Crossed eyes)

Functional defect. Misalignment of the eyes in which one eye deviates inward (towards nose) while the other fixates normally. Deviation is present when both eyes are uncovered.

EXOTROPIA (Wall-eyed)

Functional defect. Misalignment of the eyes in which one eye deviates outward (away from nose) while the other fixates normally. Deviation is present when both eyes are uncovered.

EXTRAOCULAR MUSCLES

The muscles attached to the outside of the eyeball that control eye movement. Each eye has six such muscles, coordinated by the brain. This is the reason that sudden occurrence of uncoordinated eye movements could be a sign of brain or nerve damage.

FOCUS

The eyes ability to see objects clearly at various distances through precise refraction or bending of light rays by the lens to place them exactly on the retina.

GLAUCOMA

Pathological condition. Group of diseases characterized by increased intra-ocular pressure that results in damage to the optic nerve and to retinal nerve fibers. A common cause of preventable blindness.

HERPES SIMPLEX VIRUS TYPE 2 (GENITAL)

A common virus that can be passed from the mother to the newborn causing central nervous system and other organ threat including vision problems and corneal scarring.

HYPEROPIA (Farsighted)

A refractive error in the lens of the eye, in which parallel rays of light focuses behind the retina, resulting in difficulty in near vision. Hyperopia can be corrected with convex lenses.

HYPERTROPIA

The abnormal turning of one eye in an upward direction, while the fixating eye focuses straight ahead.

INSTRUMENT-BASED SCREENING

An approach to vision screening using photoscreeners or handheld, portable autorefractors to provide estimates of refractive error and information about the eyes. Does not provide visual acuity measurements (e.g., 20/40). Estimates of refractive error cannot be converted to visual acuity measurements.

IRIS

The colored part of the eye. A thin circular membrane that opens up and closes down to regulate the amount of light entering the eye.

LENS

A transparent, elastic body behind the iris which changes shape to focus on objects at different distances from the eye. At rest, the lens is about the size of an aspirin tablet; it becomes more round when focusing at near.

LEGALLY BLIND

Functional defect. Best corrected visual acuity of 20/200 or less, or a visual field reduced to 20 degrees or less in the better seeing eye.

MACULA

The most sensitive part of the retina, about the size of a pinhead, where our most detailed vision occurs.

MARFAN SYNDROME

A genetic disorder that affects connective tissue in the body of varied onset. It can affect vision by causing a dislocated lens in one or both eyes

MICROPTHALMIA

Abnormally small eyeball.

MICROCEPHALY

Abnormal small head circumference often associated with developmental delays and vision deficits.

MYOPIA (Nearsighted)

The condition in which the eye at rest focuses light rays in front of, rather than on, the retina. Myopia is caused by the eyeball being too long, front to back, and results in near objects being seen clearly but distant objects seen with blurred vision. Myopia can be corrected with concave corrective lenses.

NEAR POINT OF ACCOMMODATION

This is a measure of the distance from the eye to the nearest point at which print can no longer be kept clear. It varies according to the power of accommodation.

NEAR POINT OF CONVERGENCE

The nearest point at which the two eyes can direct their visual lines, normally about 3" from the eyes in young people.

NEAR VISION

The ability to perceive distinctly objects at normal reading distance.

NYSTAGMUS (Jerky eyes)

A condition in which the eyes involuntarily move rapidly from side to side, up and down or in a rotary fashion.

OPTIC NERVE

The bundle of nerve fibers, roughly the thickness of a pencil, which connects each eye to the brain. Images are transmitted through the optic nerve from the retina to the brain.

OPTIC ATROPHY

Optic nerve degeneration that usually results in irreversible vision loss.

OPTOTYPE

The symbol, letter, or number on an eye chart an individual is asked to identify.

OPTOTYPE-BASED SCREENING

An approach to vision screening using eye charts or computer software.

PUPIL

Variable-sized, black circular opening in center of iris; regulates amount of light that enters the eye.

PTOSIS (toh-sis)

Functional defect. Drooping of upper eyelid. May be congenital or caused by paralysis or weakness of either 3rd (oculomotor) cranial nerve or sympathetic nerves, or by excessive weight of upper eyelids.

REFRACTION

Determination of the refractive error of an eye and the best corrective lenses to be prescribed; series of test lenses in graded power are presented to determine which provides sharpest, clearest vision.

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.)

RETINA

The back part of the eye that contains the cells that respond to light. These specialized cells are called photoreceptors. There are two types of photoreceptors in the retina: rods and cones.

RETINITIS PIGMENTOSA

The name given to a group of inherited eye diseases that affect the retina. This causes the degeneration of photoreceptor cells in the retina. As these cells degenerate and die, patients experience progressive vision loss.

RETINOBLASTOMA

Most common malignant intraocular tumor in children of the retina. It can be unilateral or bilateral, and can be identified through abnormal red reflex or whitening of the red reflex.

RETINOPATHY

Any non-inflammatory degenerative disease of the retina.

RETINOPATHY OF PREMATURITY (ROP)

Abnormal development of retinal blood vessels in premature infants that can cause retina damage and in some blindness. Those babies with birth weight of 1250 grams or below and birth before 31 weeks gestation are at highest risk for ROP.

RODS

Light-sensitive retinal receptor cells specialized to work at low light levels (night vision). There are about 120 million rods in the retina.

SCLERA (White of the eye)
Opaque outer layer of the eye.

SIGHT

The eye's ability to detect light, form and motion. Clear sight depends upon the eye's ability to send clear, accurate signals to the brain.

STEREOSCOPIC VISION

The ability to see three-dimensionally. Requires adequate fusion of the images from each eye.

STRABISMUS

When the eyes don't line up or move together properly, we call it strabismus or heterotropia. If an eye deviates inward, it is esotropia (cross eyed); if it deviates outward, it is exotropia (walleyed). Eyes may also deviate up or down.

TOXOPLAMOSIS

A prenatal illness caused by congenital or acquired infection with a protozoan intracellular parasite called *Toxoplasma gondii*. Symptoms for congenital cases may include retinal scarring, strabismus, microphthalmia, cataract, optic atrophy, and nystagmus. Acquired cases are typically from animal feces most often from cats.

USHER SYNDROME

A genetic disorder that causes hearing and vision loss that continues to worsen over time. This disorder causes the retina to deteriorate with night vision loss typically the first sign followed by blind spots, tunnel vision, and sometimes cataract formation. The retina deterioration is caused by retinitis pigmentosa or retina deterioration.

VISION

The ability to interpret and gain meaning from the things we see. Vision not only requires sight, but also interpretation, association and memory skills. Vision problems can include difficulties in eye-hand coordination, object location, visual discrimination, or visualization.

VISUAL ACUITY

The quantifiable measurement of the sharpness or clearness of vision when identifying black optotypes on a white background using specific optotype sizes at a standardized distance.

VISUAL FIELD (Field of vision)

Extent of space visible to an eye as it fixates straight ahead measured in degrees away from fixation.

VISUAL PATHWAY

Route of the nerve impulses from the retina along the optic nerve, and optic nerve radiations to the brain's sensory cortex, located at the base of the skull.

VISIBLE SPECTRUM

The colors visible to the human eye: red, orange, yellow, green, blue, indigo, and violet.

ZIKA

A virus that can be transmitted during pregnancy causing microcephaly and eye abnormalities.