

**Guidelines
for
School Vision Screening Programs:
Kindergarten through Grade12**

Colorado Department of Education

January 2006

Preface

The guidelines in this manual have been revised from the *Guidelines for School Vision Screening Programs*, September 1991, 2nd Edition.¹ Recommendations for the updated guidelines are based on C.R.S. 22-1-116 and the National Association of School Nurses, *To See or Not To See: Screening the Vision of Children in School*, by Susan Proctor².

Standardization of school vision screening programs is lacking according to Susan Proctor (2005). Areas of needed remediation noted are (1) methodology, (2) frequency of screening, (3) visual functions assessed, and (4) criteria for referral. There remain no clinical standards for schools and children in school programs endorsed by, developed by, and disseminated to, all professionals interested and affected, including nurses, which recommend specific criteria to be employed in school screening programs for children of all ages.³

In her book Susan Proctor references several researchers who have commented on the need for more standardization in the screening process.⁴ There remains a void in clear and cogent direction for comprehensive school screening parameters for persons from birth through age 22, which is the population range served by contemporary public schools.

The intent of the revised Colorado Vision Screening Guidelines is to identify the tests and appropriate equipment to use for an optimal screening program as recommended by the latest research.

These guidelines will continue to be amended and updated as new research and methodology evolve.

¹ Colorado Department of Public Health & Environment (1991). *Guidelines for school vision screening programs*. Denver, CO: author.

² Proctor, S.E. (2005). *To see or not to see: Screening the vision of children in school*. Castle Rock, CO: National Association of School Nurses

³ Proctor, S.E. (2005). *Ibid.* p.6

⁴ Proctor, S.E. (2005). *Ibid.* p. 6

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Introduction

Students' ability to see greatly impacts their ability to learn. Screening for vision problems is an appropriate and important part of school health services, largely carried out by the school registered nurse. There are roles for paraprofessionals and volunteers in vision screening, but only with training, and under the supervision of the school registered nurse. Vision screening is mandated by C.R.S. 22-1-116.⁴

Screening should be done in schools for the following reasons: 1) Large numbers of children of many ages are readily accessible in schools and can be tested in a short period of time with relative ease; 2) School screening is far less expensive than a comparable service performed in another sector of the health care delivery system; 3) In the absence of regular and quality on-going well child care from the community primary care provider, children in school afford the nurse and other school personnel an ongoing opportunity to observe, assess, and investigate potential areas of concern; and, 4) Schools have the opportunity to screen children who have not been previously screened/identified.⁵ In a study by Barbara Yawn and colleagues (1996) it was found that 76% of students with vision problems were first identified through school screening.⁶

School nurses should know screening is sound public health practice, and school is an ideal place to monitor the health of children. Screening is intended to facilitate early identification and diagnosis of disease and functional disorders. It is an easy, relatively inexpensive way to identify from a large number of apparently healthy students, those who may be at risk of having a potentially handicapping condition.

There is a distinction between screening and a screening program. Screening is a means of acquiring significant data about a population. A screening program is not a means of diagnosing vision problems, but uses collected data to refer students with possible problems for further evaluation and treatment. The distinguishing characteristic, then, is intervention, which is an essential component of a screening program. Intervention in the school setting might include adapting the school program to meet the student's needs if a problem cannot or has not been corrected.

The school nurse should plan the vision screening program with input from those involved. The success of any screening program ultimately depends upon securing the cooperation of school personnel, the child, the parents, the eye care practitioner, and others who may be participating. Careful planning can facilitate an effective screening program.

⁴ Committee of Legal Services for the State of Colorado, (2005). Colorado School Laws 2005. Denver, CO: Colorado Department of Education

⁵ Proctor, S.E. (2005). Ibid. p.2.

⁶ Yawn, B.P., Lydick, E.G., Epstein, R., & Jacobsen, S.J. (1996). Is school vision screening effective? *Journal of School Health*, 66(5), 171-175.

Helpful Tips

1. Use simple administrative procedures. Complicated ones may discourage students, parents, and teachers; time consuming ones may not be practical in the school setting.
2. Avoid unnecessary delays. Long time lapses between the screening and referral process makes the student and parent think the problem is not very important and delays evaluation and/or treatment.
3. Provide careful rechecks to eliminate unnecessary referrals.
4. Communicate clearly with students, parents, and eye care practitioner.
5. Provide a screening site and staff that are conducive to the comfort and self esteem of the student.
6. Include a follow-up aspect to the program; follow-up is critical to the success of any screening program.
7. Avoid duplication of services provided.
8. Provide supportive services when possible, i.e., translators, transportation.
9. Protect confidentiality.
10. Know what resources are available in the community.
11. Work with the community to help get new resources established.

Who is Screened?

C.R.S. 22-1-116⁷ mandates that vision screening is to be done each year for:

- All students in kindergarten, 1st, 2nd, 3rd, 5th, 7th, and 9th or comparable grade levels.
- All children new to the school system.
- All children referred by school personnel or parents.
- All students in special education programs at the age at which they would be in grades kindergarten, 1st, 2nd, 3rd, 5th, 7th, and 9th and at initial and triennial.
- Separate guidelines are available for children in the birth to five year age range.⁸

⁷ §22-1-116 CRS. Colorado Revised Statute: Education. School Children – sight and hearing tests.

⁸ Colorado Department of Education (2005). Visual screening guidelines: Children birth through five years.

Vision screening should also be provided for all high-risk children including:

- Those who repeat a grade.
- Those who failed vision screening during the previous school year and did not receive further evaluation.
- Those who seem to have difficulty with visual activities such as reading, seeing the blackboard, etc.

Minimal Vision Screening Recommendations⁹

Table 1. Screening Procedures by Grade

		K	1	2	3	5	7	9	Sped*	New	Referred
Procedures											
I	Hx /Observation	X	X	X	X	X	X	X	X	X	X
II	Distance Visual Acuity	X	X	X	X	X	X	X	X	X	X
IIIa	Plus Lens		X							X	X
IIIb	Near Vision Card		X							X	X
IV	Near Pt. Convergence		X							X	X
V	Alternate Cover**	X	X							X	X
VI	Stereo/Depth		X							X	X
VII	Color Vision		X							X	X

Note: Screening of IIIa through VII is recommended only once during a student’s career.¹⁰

*At appropriate ages for mandated grade levels and as part of initial and triennial Individualized Education Plan (IEP) evaluations.

**Kindergarten or first grade. Younger age is preferable since eye alignment problems can best be corrected at younger ages.

⁹ C.R.S. 22-1-116. School children - sight and hearing tests. The sight and hearing of all children in kindergarten, first, second, third, fifth, seventh, and ninth grades, or children in comparable age groups referred for testing, shall be tested during the school year by the teacher, principal, or other qualified person authorized by the school district. Each school in the district shall make a record, of all sight and hearing tests given during the school year and record the individual results of each test on the child’s record. The parents or guardian shall be informed when a deficiency is found. The provisions of this section shall not apply to any child whose parent or guardian objects on religious or personal grounds.

¹⁰ Proctor, S.E. (2005). Ibid.

Vision Screening Procedures

I. History and External Observations

Purpose: To detect any history or outwardly obvious ocular pathology or abnormalities.

Grades: Should be ongoing, year round observation of all students by parents, teachers, and other school personnel.

Equipment: ABC Checklist (See page 11)

Procedure: Provide the school personnel with a list of symptoms and student complaints that might indicate a vision problem.

A. Appearance of Eyes

- One eye turns in or out at any time; eyes are crossed
- Pupils/eyes appear different sizes
- Reddened eyes or lids
- Eyes tear excessively
- Drainage encrusted eyelids
- Frequent sties or swollen lids
- Drooping lids
- Discharge from the eyes

B. Complaints when working at a desk

- Headaches in forehead or temples
- Burning or itching eyes after reading or desk work
- Nausea or dizziness
- Print blurs after reading a short time

C. Behavioral signs of visual problems

1. Eye movement abilities (Ocular Motility)

- Head turns as reads across page
- Loses place often during reading
- Needs finger or marker to keep place
- Displays short attention span when reading or copying
- Frequently omits words
- Repeatedly omits “small” words
- Writes up or down hill on paper
- Rereads or skips lines unknowingly
- Unusual orientation of drawings

2. Eye teaming abilities (binocularity)
 - Repeats letters within words
 - Complains of seeing double (diplopia)
 - Omits letters, numbers, or phrases
 - Misaligns digits in number columns
 - Squints, closes, or covers one eye
 - Tilts head extremely while working at desk
 - Consistently shows gross postural deviations with close work

3. Eye-hand coordination abilities
 - Must feel things to assist in any interpretation required
 - Eyes not used to “steer” hand movements (extreme lack of orientation, placement of works, or drawings on the page)
 - Writing is crooked, poorly spaced and child cannot stay on the ruled lines
 - Misaligns both horizontal and vertical series of numbers
 - Uses hand or fingers to keep place on the page
 - Uses non-writing hand as “spacer” to control spacing and alignment
 - Repeatedly confuses left-right directions

4. Visual form perception (visual comparison, visual imagery, visualization)
 - Mistakes words with same or similar beginnings
 - Fails to recognize same word in next sentence
 - Reverses letters and/or words in writing and copying
 - Confuses same word in same sentence
 - Repeatedly confuses similar beginnings and endings or words
 - Fails to visualize what is read either silently or orally
 - Whispers to self for reinforcement while reading silently

5. Refractive Status (Nearsightedness, Farsightedness, and Focus Problems)
 - Comprehension reduces as reading continues: loses interest quickly
 - Mispronounces similar words while reading
 - Blinks excessively with close work and reading
 - Holds book closely to face or face close to the desk top
 - Avoids all near/close tasks
 - Complains of discomfort in tasks that demand visual attention
 - Closes or covers one eye when reading or doing close work
 - Makes errors in copying from reference book to paper
 - Makes errors in copying from the board to paper
 - Squints to see the board or overhead screen or asks to move nearer
 - Rubs eyes during or after short periods of visual activity
 - Fatigues easily
 - Blinks excessively to “clear up” when changing focus from near to far

Referral Criteria:

If a student has any of the listed symptoms, even if he or she passes all other vision screening, refer.

Tips:

- This list should be distributed to the teachers prior to the screening.
- This list could be printed in the school newsletter for parents prior to the screening.
- Use the “ABC Checklist” before the screening date and throughout the school year, for teacher referrals, for screeners noting a concern at the time of the screening, and prior to re-screen and/or referral¹¹

¹¹ Modified from “Learning Related Visual Problems”, ERIC Clearinghouse on Handicapped and Gifted Children, 1920 Association Drive, Reston, VA, 22081, 1981.

Sample Form

Name: _____ Grade: _____ Date: _____
School: _____ Teacher: _____

ABC Checklist
Vision Observation and History

Please check appropriate items and return to: _____

Appearance – Do the eyes look normal?

- _____ Eyes turn in or out or eyes are crossed
- _____ Crusty or red eyelids
- _____ Different size pupils or eyes
- _____ Swelling of eyelids
- _____ Conjunctivitis (pink eye)
- _____ Drooping lids
- _____ Eyes appear hazy or clouded
- _____ Other: _____

Behavior – Teacher/Parent/Guardian Observation

- _____ Tilts head, covers or closes one eye for critical seeing
- _____ Thrusts head forwards, squints or frowns
- _____ Difficulty in keeping place while reading; a “finger” reader
- _____ Disinterested in activities involving critical seeing
- _____ Excessive stumbling, awkwardness or daydreaming
- _____ Holds printed materials in an unusual position
- _____ Rubs eyes frequently
- _____ Attempts to brush away “blur”
- _____ Blinks excessively
- _____ Stops reading after a brief periods
- _____ Reverses words or syllables
- _____ Avoids close work
- _____ Other: _____

Complaints – Child’s Statements

- _____ Eyes hurt or blur while reading
- _____ Headaches, dizziness, or nausea following close work
- _____ Words move or jump about when reading
- _____ Double vision
- _____ History of head injury with vision complaints
- _____ Unable to see the board
- _____ Eyes itching, burning or a “scratchy” feeling
- _____ Difficulty seeing near objects
- _____ Other: _____

II. Distance Visual Acuity

Purpose: To test clearness of vision when looking in the distance; to detect myopia (nearsightedness), amblyopia, and astigmatism

Grades: Kindergarten, 1st, 2nd, 3rd, 5th, 7th, 9th, special education students, new students, and referrals.

Equipment: Distance Sloan 10 or 20 foot chart that includes a 20/25 line, occluder (i.e. paper cup or paper patch). **Note:** Ten foot chart preferred for young children since it is easier to attend when screening tools and screener are closer.

Procedure:

A. Select a room for testing that is well-lit, preferably with subdued ambient room lighting and maximum natural lighting (sunlight).¹² All glare must be eliminated from the chart surface.

Note: Self-illuminated charts are preferred over non-illuminated because self-illuminated equipment avoids yellowing, shadows are minimized, and the letters are well-contrasted. However clean, white wall charts with clear contrast between the letters and the background will do just as well.

- B. If a child wears glasses, testing should be conducted with the glasses on.
- C. Mount the wall chart at the child's eye level. Adjust the chart height for the size of the person being screened. A suggestion is to place Velcro on the wall and move the chart as needed.
- D. Mark off 10 or 20 feet, whichever is appropriate for your chart. The line may be marked with masking tape or paper feet placed on the floor so that the child will be the required distance from the chart.
- E. Ask the child to position heels on the line or other floor marking. Do not allow the child to lean the torso or head forward.
- F. Occlude left eye with an occluder, a card, or disposal cup and test the right eye. Then reverse the procedure and test left eye. Be consistent in testing the right eye first to avoid recording errors.
- G. If the child is already wearing glasses or contact lenses, determine the reason for the correction. Test the child with and without glasses to attain a baseline. If the glasses are to correct for a distance vision problem and prescription is current, testing with the glasses on should produce a better result. If the glasses are for astigmatism, which may be affecting both near and distance vision, testing the child with and without glasses will help determine if distance vision is affected.¹³
- H. Instruct student to keep both eyes open and read the selected letter or line of letters with the uncovered eye.

¹² Proctor, S.E. (2005) Ibid. p. 114.

¹³ Proctor, S.E. (2005) Ibid. p. 117.

Note: Point to the letters, below the line or symbol. A paper cut out may be used to isolate the letter or line of letters.

- I. When testing start with at least the 20/50 line and move down to 20/20 line. If the student is unable to read 20/50 line move upward.

Note: Number of misses allowed in the line to pass:¹⁴

- 1-3 optotypes = No misses
- 4-7 optotypes = One miss
- 8-11 optotypes = Two misses

- J. Record results. Record the line number for the last line read correctly with each eye. Refer all failures to the school registered nurse for re-screening.
- K. For younger children:
Use the Tumbling E, HVOT, Lea symbols, or the Lighthouse charts. All other charts are not recommended (NASN)

Show the child what is expected to be done:

- “This is an E. See which way the legs of the E are pointing. Show me with your fingers how the E is pointing.” With younger children have them use their arms to show which way the E is pointing.
- Be sure the young child understands “the E game” and can show you which direction the E is pointing. It may be helpful to ask teachers to practice with students in the classroom before screening day.
- The student may point to a wooden block E, the letters H, O, V, T or symbols to identify what is seen on the chart.
- Demonstrate how to use the occluder
- Test from the top of the chart (larger letters or symbols first) down toward the bottom (smaller letters or symbols)
- For younger children, preschool through kindergarten each eye must see at least the 20/40 line. The important exception is a two line difference between the two eyes.

Referral Criteria:

For students in first through 12th grade each eye must see at least the 20/30 line; if not the student should be referred. The important exception is a two-line difference between the eyes.

Table 2. Distance Vision: Referral Criteria

Each eye must see at least the 20/30 line (except for kindergarten); if not, the student is to be referred. The important exception is a two-line difference between the two eyes. For example: Right 20/20 Left 20/30 should be referred because there is a two-line difference (the second line being the 20/25 line).

¹⁴ Proctor, S.E. (2005). Ibid. p. 116.

Table 2. Referral Criteria

ONE EYE	OTHER EYE	RESULTS
20/20	20/20	Pass
20/25*	20/25	Pass
20/30	20/30	Pass
20/20	20/25	Pass
20/20	20/30	Refer: 2-line difference
20/30	20/40	Refer (except K)
20/40	20/40	Refer (except K)

* All charts should have a 20/25 line.

Tips:

- Do not allow students to squint during the test.
- Present letters or symbols in reverse or inconsistent order between students.
- Familiarize younger children with the letters or symbols prior to the screening
- Vision is recorded as a fraction. The top number (numerator) recorded refers to the number of feet from the eye chart, and the lower number (denominator) refers to the line on the chart the student is able to read. The chart will indicate if it is for use at 10 feet or 20 feet. If a 20 foot chart is used the top number is recorded as 20. If a 10 foot chart is used record the 20 foot equivalent value (see Table 3). The 10 foot charts should indicate the 20 foot equivalencies at each symbol line, usually along the left-hand margin. Other fractions that may appear on the chart with 6 as the numerator, indicate the metric equivalent.

Note: Sloan charts are recommended over Snellen charts because the Sloan charts have higher sensitivity and specificity. (Proctor, page 51-52, Table 4-2) They also contain five optotypes per line, to inducing a “crowding effect”, which challenges the eye to discern individual letters. (Proctor, page 53) Letters are also depicted in the same font, without serifs, and with the same boldness.¹⁵

Table 3. Example of Conversion for Ten-Foot Charts*

SYMBOL SIZE	DISTANCE	ACUITY MEASUREMENT
20/20	10 feet	20/10
20/20	20 feet	20/20
20/40	10 feet	20/80
20/20	5 feet	20/80

*Ten-foot charts will provide instruction on how to convert values

¹⁵ Proctor, S.E. (2205). Ibid. p. 55.

III. Near Vision Tests – Plus Lens and Near Vision Cards

Note: The plus lens test is preferred over other methods in school screening for hyperopia due to the inadequacy of other near point testing methods. Young children can often successfully accommodate long enough to complete a test of near vision when near acuity cards, charts, or slides are used. This accommodation overlooks a legitimate refractive error. This phenomenon is less likely to occur with the plus lens. (Proctor, page 92) In a situation when a child is referred (by school staff or a parent for a vision screening because of a suspected vision problem and no hyperopia is found with the plus lens test, the nurse may want to use near cards, charts, or slides to ascertain acuity scores for near vision.¹⁶

III A. Plus Lens Test

Purpose: To detect the refractive error, hyperopia (also known as hypermetropia, formerly termed “farsightedness) in which incoming images converge “behind” the retina and not on it resulting in a blurred image. The convex plus lens provides a degree of refraction to the hyperopic eye, “pulls” the image forward so it converges on the retina resulting in clear (or “normal”) vision.

Grades: 1st, new students and referrals: at least once during their school career is sufficient

Equipment: Sloan distance chart, occluder and plus 2.50 diopter (D) lens, or flipper

Procedure:

- A. Follow procedures A – F under distance visual acuity. This test may be done immediately following the distance visual acuity test.
- B. Place (or have the child place) a +2.50 D lens over the eye being tested and the occluder over the other eye. If a flipper is being used, have the student hold it in his/her right hand and place it on the nose as if it were a pair of glasses; when you are ready to test the second eye, instruct the student to “flip” the lenses so that the opposite eye is occluded. (If plus lenses are used that are mounted in a regular glasses frame and the child is old enough, he or she may hold the occluder. If a single plus lens is used in a frame with a handle, an assistant may be needed, as young children may not be able to simultaneously position and hold an occluder in one hand and a plus lens in the other.)
- C. Direct the child’s attention to a letter on the 20/30 line of the Sloan chart.
- D. Ask the child to read/name the letters, symbols or pictures on the 20/30 line while looking through the plus lens with one eye. Allow the child to try again if necessary. The inability to read the line is a PASS, and the child likely has no treatable hyperopia

¹⁶ Proctor, S.E. (2005). Ibid. pp. 92-93.

in the eye being tested. If a child is able to read any of the optotypes on the 20/30 line while looking through the plus lens, this is not a PASS,* and the child should be brought back and retested in about two weeks.

E. Proceed to the other eye (“flip” the flipper) and repeat the process.

Referral Criteria:

If on retest the student is still able to read any of the optotypes on the 20/30 line while looking through the plus lens, this is not a PASS,* and the child should be referred. Failure in one eye or both constitutes a referral.

*Avoid using the word *fail* in front of a child, adolescent or parent

Tips:

- Students who pass the test often comment that the plus lens makes things “blurry.”
- Do not screen preschool or kindergarten using plus lens.
- If student is wearing glasses determine the reason for correction. If the glasses are for reading, test the child with and without glasses to attain a baseline. If the glasses are to correct for a distance vision problem and prescription is current, testing with the glasses on should produce a better result. If the glasses are for astigmatism, which may be affecting both near and distance vision, testing the child with and without glasses will help determine if the problem under treatment affects near or distance vision.¹⁷
- If student is wearing contact lenses, and does not pass plus lens test, note contact lens wear on referral sheet.

¹⁷ Proctor, S.E. (2005). Ibid. p. 97.

III B. Near Vision Cards

Purpose: Near vision cards are used to assess near visual acuity; detect excessive hyperopia/hypermetropia (farsightedness)

Grades: First school entry, kindergarten or 1st grade and Special Needs Students. At least once during their school life is sufficient

Equipment: Near Vision Cards with Lea Symbols or Sloan letters, occluders

Procedure:

If a child is wearing glasses determine if they are for reading or for distance. If the glasses are for reading, test with and without glasses to establish a baseline. If they are correction for a distance problem, remove the glasses during near vision testing.

- A. Mount or hold the card at the appropriate distance from the face at eye level (refer to manufacturer's recommendations).
- B. Test in a room that is well-lit. As the card is presented make sure it is free from shadows, glare, and yellowing.¹⁸
- C. Do not allow the child to lean the head or torso forward.
- D. Occlude the left eye with an occluder, a card, or cone-shaped cup and test the right eye. Then reverse the procedure and test left eye.
- E. Direct the child's eye to the 20/70 line on the card /chart and move down the card.
- F. Ask the child to name or read the letter or symbols on each line as directed. If child is able to read "most" of the optotypes on the line, the child passes. "Most" will vary by chart instructions and by state or local regulation. Susan Proctor recommends using the PASS/NO PASS criteria established by the Ohio Department of Health for school screening.

Note: Number of misses allowed in the line to pass:¹⁹

- 1-3 optotypes = No misses
- 4-7 optotypes = One miss
- 8-11 optotypes = Two misses

- G. If the child is unsuccessful, he or she should be retested at a later date prior to referral; two weeks is suggested between test and retest. Do not comment either positively or negatively on the child's responses.

¹⁸ Proctor, S.E. (2005). Ibid. p. 98

¹⁹ Proctor, S.E. (2005). Ibid. p. 116.

H. The retest should be performed using a Plus Lens rather than a near vision card.

Referral Criteria:

Follow manufacturer's instructions, depending on the equipment being used or more optotypes are misread than the recommended amount (see above).

Tips:

- Make sure the child does not lean forward and keeps the distance consistent between his or her face and the near vision card. If a string is attached, it should be taut.
- Follow the manufacturer's instructions.

IV. Near Point of Convergence

Purpose: To screen for adequate convergence skills; detects convergence insufficiency.

Grades: First grade, new students and referrals; at least once during their school career is sufficient.

Equipment: A small hand-held fixation target. Examples: finger puppet, the eraser end of a pencil, or tongue depressor with a picture sticker attached to the end.

Procedure:

If the child is wearing glasses determine if they are for reading or for distance. If glasses are for reading, test with and without glasses to establish a baseline. If the correction is for a distance problem, remove the glasses.

- A. Sit or stand directly in front of the child.
- B. Hold the fixation target at 18 inches from the child's face.
- C. Instruct the child to look at the target as the screener moves it slowly toward the bridge of the child's nose.
- D. As the target is moved toward the child's nose, observe the eye movement. When one eye stops converging, one eye will wander outward. If neither eye turns out, record "TN" (To Nose). Keen observation is needed. Record how far the target is from the bridge of the nose when the eyes no longer converge.
- E. Repeat the test several times. For all failures, repeat the test to make sure the child did not just look away at that moment.
- F. The student should be able to converge to at least 3 inches, measured from the bridge of the nose. If not, the student is to be re-screened in approximately two weeks before referring.

Referral Criteria:

Refer if the student is unable to converge to at least 3 inches from the bridge of the nose after re-screen.

Tips:

- There is a higher prevalence of hyperopia among African American and Caucasian boys and girls than in other populations.²⁰
- There is a somewhat higher rate of hyperopia in females than in males.²¹

²⁰ Proctor, S.E. (2005). Ibid. p. 87.

²¹ Proctor, S.E. (2005). Ibid. p. 87.

- Ritalin and Adderall have been reported to affect accommodation. Strattera appears to do so to a lesser degree.²²

²² Proctor, S.E. (2005). Ibid. p. 102 and Nguyen, T. (2005, February). *Vision assessment to help children attain academic excellence*. Paper presented at annual meeting of the California School Nurse Organization, Hollywood, CA.

V. Alternate Cover Test

Purpose: To test eye alignment and detect potential misalignment; detects heterotopia (strabismus) and heterophoria

Grades: Kindergarten or first grade, new students and referrals: at least once during their school career is sufficient

Equipment: Occluder or single occluder patches, focal object for near and far screening

Procedure:

- A. Position the child about 2 feet from you and facing you.
- B. The child may stand or sit.
- C. For Near Point Assessment:
 1. Direct the child's attention to a near focal point in your hand (tongue blade with a picture or design, finger puppet or another near focal object) held closely to your own midline of vision or to your nose. Hold the focal object in your left hand if you are right-handed.
 2. Hold the occluder upside down (with the handle up) in your dominant hand. Move it back and forth rapidly over the bridge of the child's nose occluding one eye and then the other. The fairly rapid speed, about 1 second for each eye, is necessary to disrupt fusion (i.e., to prevent the child from targeting the focal object with both eyes simultaneously).
 3. Observe the occluded eye as the cover is being removed.
 4. If you observe movement in the eye when the cover is removed, ask yourself the questions, "Where did it come from?" "From what direction did the eye move?" If the movement was from the inner or nasal canthus back to the midline, the eye had deviated under the cover and is now realigning itself so as to target the focal object. In this case, a presumed esophoria is present. If, on the other hand, you observe movement from the outer canthus back to the midline when the cover is removed, a presumed exophoria is present. Similar vertical movement suggests hyperphoria. Hypophorias are generally not seen.²³ (Manley 1975).
 5. If in doubt, retest at a different time.
- D. For Far Point Assessment:
 1. Direct the child's attention to a distant focal point, wall-mounted or otherwise, that requires his or her eyes to be straight ahead facing you, but not looking at you.

²³ Manley, D.R. (1975). Strabismus. In R.D. Harley (Ed.) *Pediatric ophthalmology* (pp. 132-192). Philadelphia, PA: W.B. Saunders.

Often it is convenient to ask the child to look at a distant object over your shoulder.

2. Again, hold the occluder upside down (with the handle up) in your dominant hand. Move it back and forth rapidly over the bridge of the child's nose occluding one eye and then the other. The fairly rapid speed, about 1 second for each eye, is necessary to disrupt fusion.
3. Observe the occluded eye as the cover is being removed.
4. If you observe movement in the eye when the cover is removed, ask yourself the question previously posed, "Where did it come from?" ("It" refers to any movement seen.) the movement was from the inner or nasal canthus back to the midline, the eye had deviated under the cover and is now realigning itself so as to target the focal point; in this case, a presumed esophoria is present. If, on the other hand, you observe movement from the outer canthus back to the midline when the cover is removed, a presumed exophoria is present. Similar vertical movement suggests hyperphoria. Hypophorias are generally not seen.
5. If in doubt, retest at a different time.

Referral Criteria:

Any consistent horizontal, vertical or diagonal movement of the covered or uncovered eye while student has gaze fixated on an object is a referral.

Tips:

- Use a picture, poster or sign as the distant fixation target.
- If student wears glasses, test with glasses on.

VI. Stereo/Depth Perception

Purpose: To test for binocularity; detects amblyopia, suppression, and poor ocular alignment

Grades: First grade, new students and referrals: at least once during their school career is sufficient

Equipment: Polarized glasses, polarized stereo depth test (e.g., stereo fly, stereo reindeer, stereo butterfly or Randot)

Procedure:

- A. Seat the child at a table or a desk.
- B. Ensure bright lighting.
- C. Seat yourself close to the child.
- D. Place the two-sided booklet containing the Fly (Reindeer) flat on the table or desk, or slightly propped up so that the child can easily perceive it.
- E. Place the polarized glasses on the child's face. (The glasses are fragile and excessive handling by children can result in breakage.)
- F. Direct the child's attention to the Fly on the right side of the booklet.
- G. Ask the child what he/she sees. Frequently, most children will make a great expression of glee as they perceive the Fly three-dimensionally. The Fly's wings (Reindeer's antlers) appear as if they are "popping out" from the booklet – ask the child to "pinch" the wings (or antlers, if using the stereo reindeer).
- H. Proceed to the left side of the booklet and ask the child to look at the nine Titmus Stereo Circles on the upper half (older children), or the stereo animals on the bottom half (younger children). A child who does not have an alignment disorder or a severe acuity problem should perceive one circle in each group of four (or one animal in each group of five) three-dimensionally. The manufacturer's guidelines provide an indication of the severity of the stereoacuity problem depending on how many circles or animals can be seen. The visual acuity of circles one through nine ranges from 20/200 down to 20/25.
- I. The test may be repeated for confirmation at another time prior to referral.

Referral Criteria:

Refer if the Fly (Reindeer) is not seen 3-dimensionally in younger students. Refer students in second grade or higher if unable to identify the correct response in at least five of the numbered circles.

Tips:

- If a student wears glasses, test with glasses on. Put the polarized glasses over them.
- Ability to perceive the Fly (Reindeer) stereoscopically does not suggest the absence of visual problems because the Fly detects only very gross stereoscopic difficulties, e.g., 20/200 acuity. so be sure to proceed to the more accurate pictures on the opposite side of the testing book.

VII. Color Vision Screening

Purpose: To identify any deficiency in the ability to recognize color.

Grades: First grade, new students, and referrals; at least once during their school career is sufficient.

Note: Color vision screening may be done earlier if a potential problem is identified.

Equipment: Pseudoisochromatic plates for testing.

Note: Use normal lighting for valid color testing. If dim lighting is used, color vision testing is likely to be inaccurate.

Procedure:

- A. Place the plates on the table with the book closed.
- B. Seat student comfortably at table.
- C. Sits next to the student.
- D. Show student how to use a clean soft paint brush or clean cotton tipped swab to trace symbols on the color plate. Do not use fingers or pencil to trace as oil in the skin can cause color change of the plates.
- E. Follow manufacturer's directions for scoring.

Referral Criteria:

Note: Failure in this test is not a cause for referral to an eye care practitioner since no correction is possible. Some younger children may not do well on this test because of difficulties in seeing figures against background, unrelated to color deficiency. Reevaluate 6-12 months later. Provide consultation to parents and teachers.

- Inform parents of the student's color vision deficiency, if present. Color deficiency is usually non-progressive, cannot be corrected, and usually does not affect visual acuity or visual function.
- Inform the teachers and counselors of the student's color vision deficiency so that they may:
 - Adjust educational materials to situations where color discrimination is not a criterion for progress.
 - Help the student to develop special techniques for compensating for their limitations.
 - Take into account color vision difficulties for driver training and vocational guidance.

Screening Worksheet

Name _____ Date: _____
 Grade _____ Teacher _____ School: _____
 Vision: Wears Glasses: yes _____ no _____ Reading _____ Distance _____
 If yes, glasses are worn at screening: yes _____ no _____

				Re-screen	
		Pass	Fail	Pass	Fail
1. Distance Visual Acuity	R 20/	[]	[]	[]	[]
	L 20/	[]	[]	[]	[]
2. Plus Lens Test	R	[]	[]	[]	[]
	L	[]	[]	[]	[]
3. Near Vision Cards	R	[]	[]	[]	[]
	L	[]	[]	[]	[]
4. Convergence near point _____ inches		[]	[]	[]	[]
5. Cover Test	R	[]	[]	[]	[]
	L	[]	[]	[]	[]
6. External Observation _____		[]	[]	[]	[]
7. Stereo / Depth Perception _____		[]	[]	[]	[]
8. Color Vision		[]	[]	[]	[]

Passed _____ Re-screen _____ Refer _____ Date _____

Comments: _____

Hearing: History of infections: yes _____ no _____ Tubes: yes _____ no _____

Pure Tone:

R 500 _____ 1000 _____ 2000 _____ 4000 _____

L 500 _____ 1000 _____ 2000 _____ 4000 _____

Passed _____ Re-screen _____ Refer _____ Date _____

Comments: _____

Height _____ inches Weight _____ pounds

Vision Testing of Young Children and Children with Special Needs

Young children and children with special needs require particular screening attention. They may have short attention spans, limited verbal expression and language skill, processing delays or difficulties, and possible fear of new situations and unfamiliar adults. When planning, organizing, and implementing a vision screening program for children in need of special care follow the recommendations and procedures for a regular testing.

Vision testing of young children with special needs should be conducted by using methods and equipment suitable for the child's developmental abilities. The following charts are listed in the order of ascending cognitive order:

- All symbol charts
- HOTV
- Tumbling or "Illiterate" E
- Number charts
- Letter charts

Prescreening activities may include the following:

- If using the Tumbling E, use an "E" shaped paper cut out to teach the positions of up, down, right, and left positions in the classroom. Ask the students to state the direction in which the legs are pointing.
- If using the HOTV or symbols, make up a card with enlarged images of those letters so that the student can point to the symbol they see, if verbal skills are limited.
- Have the parent/guardian and the teacher fill out the "ABC Checklist".
- It may be appropriate to set aside a time and setting away from the mass school screening so more time and attention can be provided to the student.

The McDowell Vision Screening Kit is a tool that can be used for testing very young or severely disabled students. This kit provides a functional assessment of distance, near, and color vision, and ocular alignment and ocular motility. For more information about this test please refer to "Additional Vision Equipment" on page 34.

The Colorado Department of Education has guidelines available for screening vision with children birth to five years of age (CDE, 2003). These guidelines can be used for students with developmental, behavioral, and language delays.

Implementation procedures, such as planning, referral, recording, and follow-up, for young children and special education students are done in the same manner as the regular vision test procedures outlined in these Colorado Guidelines.

Vision recording or documentation on the Individual Education Plan (IEP).

- Record the vision tests in lay terms; i.e. distance, near, color, etc.
- Record actual numerical results when appropriate; i.e. right 20/20, left 20/80.

- Record date of the testing.
- Describe any barriers to testing or delays in acquiring a professional eye examination.
- Include any special vision recommendations for visual accommodations in the classroom setting.²⁴

²⁴ California Department of Education (CDE). (2005). *A guide for vision testing in California public schools*; Sacramento, CA: CDE.

Vision Screening Referral

1. The school registered nurse coordinates/supervises the vision screening program.

All failures are referred to the school nurse for review and determination of action to be taken. This includes re-screening of those who fail the initial screening. It is best for screening to be completed by the end of the first semester. However, some districts screen students throughout the school year. In those districts, it is recommended the same grades be screened at the same time each year.

2. Re-screening should be completed by the school registered nurse no later than 30 working days following the initial school vision screening.
3. If re-screening tests are failed, a written referral form should be signed by the school registered nurse and sent to the student's parent/guardian within 10 days following the 2nd vision screening. The referral form should provide a space for the results of the professional eye examination, recommendations, and glasses prescription if needed (see samples in Appendix).
4. A list of students referred for vision evaluation should be given to classroom teachers to make them aware of students' needs (e.g., preferential seating).
5. The referral to an eye care professional should follow state guidelines (see "Referral Criteria" for each vision screening test) or district policy as they are available.
 - Parents should be notified in writing and by telephone of the need for follow-up. Explain the screening process, including re-screening, to the parent.
 - In the referral letter, the school nurse should invite parents to make contact with the nurse about the referral should they have any questions. If the parents do not have health insurance with vision coverage, information about availability of financial assistance should be included (see sample letters, page 44 and 45).
 - National Association of School Nurses (NASN) is one resource available to school nurses for gift certificates (or vouchers) provided through the vision insurance organization, Vision Service Plan (VSP). This organization sponsors "Sight for Students", which is a vision program providing vouchers for an examination and glasses, if prescribed, for children through age 18, whose families are not eligible for Medicaid. The referral must come from the school nurse who is an NASN member. For more information access www.sightforstudents.org or www.nasn.org.²⁵

²⁵ Proctor, S.E. (2005). Ibid. p. 217.

- A form should be created that facilitates transfer of information to the eye care practitioner, and allows for a return response from the eye care professional (see page 44 and 45).
- Ideally the referral letter with the screening report form should be mailed to the parent/guardian. Forms sent home with students may become lost. Enclosing a self-addressed stamped envelope may encourage the eye care practitioner or parent to return results to the school nurse.

Vision Screening Follow-up Process

The school registered nurse is responsible for monitoring students to determine if further evaluation and remediation is indicated.

Suggestions for vision referral follow-up:

1. Completed vision referral forms should be returned to the school registered nurse for review after the examination has been provided by the eye care professional.
2. The results of the professional eye exam and evaluation should be relayed in writing to the classroom teachers.
3. If there is no response from the parent regarding the referral form, within 30 days, contact should be made with the student and/or parent/guardian inquiring as to the status of the referral. (second parent contact)
4. The school registered nurse should provide the student's parent/guardian information regarding community resources available for payment of eye examination and glasses for needy students.
5. If, after the second contact, the referral is not received within 10 days, a direct contact should be made by phone with the student's parent/guardian. (third parent contact)
6. The school registered nurse will determine if a Child Neglect Complaint should be filed with Social Services if the above steps have been followed, and no evaluation has been completed.
7. In order to assess and evaluate your screening program, data collection should be done by the registered school nurse as determined by your district policy.

Personnel and Training

Education of vision screeners is one of the most important elements when using inexperienced personnel, or volunteers, to assist with the vision screening program.

Recommended Test

Training Requirement

- | | |
|-----------------------------------|---|
| 1. Observation----“ABC Checklist” | 1. Can be administered by any trained screener with input from teacher/parent/guardian. |
| 2. Distance Acuity | 2. Can be administered by trained screener. |
| 3. Plus Lens | 3. Can be administered by trained screener. |
| 4. Near Vision Card | 4. Can be administered by trained screener. |
| 5. Near Point of Convergence | 5. Requires experience/training. School nurse or well trained allied health personnel. |
| 6. Alternate Cover Test | 6. Requires experience/training. School nurse or well trained allied health personnel. |
| 7. Stereo/Depth Perception | 7. Can be administered by any trained screener. |
| 8. Color Vision Screening | 8. Can be administered by any trained screener. |

Note: The vision re-screening should be completed by the school registered nurse prior to sending a written referral to the parent/guardian for a professional eye exam.

Suggestions/Tips for Training Vision Personnel

It is up to each individual school nurse to determine how to set up training programs. Listed below are some suggestions that may be helpful. It may also be beneficial for the school nurse to learn appropriate Spanish to facilitate the vision screening.

- Prior to your screening date determine how many additional vision screening personnel you will need.
- Contact your personnel and bring them in for a one hour training session with the school district nurse.
- Do the training within two weeks of the screening date, as they may forget training procedures if the training takes place too far in advance.
- Show them the video “Focus on School Vision”, Vision Screening Guidelines, 9/1991.
- After the video, go through each of the tests listed in your Vision Screening Guidelines Manual, and practice doing the tests on one another until they are comfortable.
- Review and explain each of the forms that will be used during the screening.
- Review the expectations of documentation and discuss confidentiality issues.
- Discuss specific assignments and go through the procedure of how things will evolve on the actual screening day.
- Answer any questions the screeners may have.
- Refer to *Visual Screening Guidelines: Children Birth through Five Years*²⁶ to gain further information to facilitate screening of young children.

²⁶ Colorado Department of Education (2005). Visual screening guidelines: Children birth through five years

Additional Vision Equipment

There is a considerable variety of tests available for school vision screening, some are designed to assess several vision functions, others, a single function, some are inexpensive and others are very costly. For further information refer to the NASN publication, *To See or Not to See: Screening the vision of Children in School.*²⁷

McDowell Vision Screening Kit

Series of tests for a functional (behavioral) assessment of distance, near, and color vision, as well as ocular alignment and ocular mobility. The test is for use with very young or severely disabled children.

Advantages: Most children will respond in some way to aspects of the test.

Disadvantages: Does not meet criteria for optimal sensitivity and specificity. A test needs to be devised that will fulfill this need

Stereoscope Machine

Portable slide-based vision screeners that combine the testing of several visual functions, including near, distance, binocular, and color vision through the use of slides contained in a single machine.

Advantages: Combines the testing of several visual functions in one unit.

Disadvantages: Validity of test results mixed.
Weight up to 20 pounds.
Cost (\$1500.00---2004 model)

Computer Software

Advantages: Several visual functions can be tested at one sitting.
All test distance vision.
Most test near vision.
Appropriate for use by non-health care professionals.

Disadvantages: Programs differ as to which functions they assess.
Some programs have less than optimal lighting for color vision.
Some programs do not meet criteria for optimal sensitivity and specificity.
Need for computer and electricity, and price of software.

Photorefractive Images

²⁷ Proctor, S.E. (2005). Ibid.

A high speed Polaroid camera takes a photograph of the red reflex and the corneal light reflex bilaterally. Can detect hyperopia, myopia and alignment.

Advantages: Testing requires less time than traditional methods making the test optimal for mass screening.
Volunteers could take pictures while interpretation is left to trained professionals.
Purported to be desirable screening technique for preverbal, nonverbal, or developmentally delayed children.

Disadvantages: Effectiveness depends on examiner's ability to correctly interpret results.
Need availability of computerized analysis of the reflexes to increase accuracy of interpretation of findings.
Insufficient research and studies to date present conflicting advice.

Table 4. VISION SCREENING SUMMARY

<i>TEST</i>	<u>GRADE</u>	<u>TOOL</u>	<u>REFERRAL CRITERIA</u>
I. History & Observation	K, 1,2,3,5,7,9 Special Education New Students Referrals	ABC Checklist	If a student continues to have any listed symptoms or complaints, <i>even if they pass all other vision screening</i>
II. Distance Acuity	K, 1,2,3,5,7,9 Special Education New Students Referrals	Sloan Chart with 20/25 line, Tumbling E, HOTV, Lea Symbols, Lighthouse Chart	<u>K</u> : 20/40 or better, each eye <u>1-12</u> : 20/30 or better, each eye <u>K-12</u> : two-line difference between eyes
III a. Plus Lens Preferred test for hyperopia	1 st grade New Students Referrals	Sloan Chart with 20/25 line, +2.50 D lens & occluder (or +2.50 D flipper lens)	If student reads 20/30 line with either eye
III b. Near Vision Card	1 st grade New Students Referrals	Near Vision Card with Lea Symbols or Sloan Letters	Follow card manufacturer's instructions
IV. Near Point Convergence	1 st grade New Students Referrals	Small, hand-held Fixation Target	The student is unable to converge to at least 3" from the bridge of the nose
V. Alternate Cover	K or 1 st grade New Students Referrals	Near & Far (at least 10 ft.) Fixation Target, occluder	Any consistent movement of the uncovered eye while student has gaze fixated near or far
VI. Stereo/ Depth Perception	1 st grade New Students Referrals	Stereo Fly (Reindeer), Randot	1 st : If fly not seen in depth 2-12 th : Student able to see less than 5 of the numbered circles
VII. Color Vision	1 st grade New Students Referrals	Pseudoisochromatic Plates	No referral necessary: inform parent & teacher

Evaluation of the Vision Screening Program

To determine the effectiveness of the vision screening program, careful and comprehensive evaluation of the planning, implementation, referral process, and referral outcomes must be completed with each vision screening. Much of this information may be essential for reports to the Board of Education or other resources to maintain funding to assist with vision exams and eye care. Evaluation is an ongoing process.

The most important component of a vision screening program, and often the most difficult and time consuming, is following up with the referrals. It is essential that the children referred are seen by an eye care professional and receive appropriate treatment. Parents may not take children for a professional eye exam for a variety of reasons. The most common reason is lack of insurance or means to pay for an exam or glasses if they are prescribed. It is important for the school nurse to become familiar with resources available for exams and glasses.

Keeping data about the outcomes of the vision screening program and referrals helps the school nurse evaluate the effectiveness of the program. There are many questions that can be answered from the acquired data. For example: Were too many children referred for a specific test? To answer this question information in the form of a written report from the eye examiner is needed. It would be good practice to include an eye examination report form with notice of the referral for the parent to take to the doctor to complete after the exam and return to the school. The school nurse could also assist in reminding the parent about follow-up visits, if recommended in these reports. Other information that can be gathered in the evaluation process is the numbers of students screened, the number of referrals, the types of vision problems identified, and the numbers of children receiving care.

A sample log sheet is included in these guidelines to assist in collecting data and tracking screening outcomes. These results can be used to report on the effectiveness of the vision screening program to appropriate committees or agencies.

Attending to the evaluative aspects of the vision screening program is essential to enable the school nurse to see the effects on learning and education for those children receiving care and to be able to recommend changes in the program structure or process.

APPENDIX A: GLOSSARY²⁸

Alternate cover test - A traditional measure of ocular alignment in which first one eye and then the other is occluded in rapid succession: the occluded eye is observed for movement when the cover is removed, and the unoccluded eye is observed for movement while the other eye is under cover. The alternate cover test will detect both heterophoria and heterotropia and is the only measure of heterophoria possible in the school setting.

Amblyopia - An ocular condition in an otherwise healthy eye, in which there is an abnormality of cortical response in the occipital lobe of the brain due to insufficient or inadequate stimulation of the fovea, neural pathway, and cortex that may result in unilateral vision loss if untreated.

Astigmatism - A refractive error of the eye in which, with accommodation suspended, the refracting power of the eye is not uniform in all directions such as that incoming rays of light in a single eye do not come together to focus at a single point, but rather are focused at two or more points that usually results in blurred or partially blurred vision.

Binocularity - The characteristic of the eyes when binocular vision is intact. Used interchangeably with *binocular vision* and requires both ocular alignment and stereoacuity.

Color vision deficiency - A diminution or lessening of one of the three pigments in the color-sensitive cones of the retina that usually results in difficulty with saturation and brightness of colors rather than color or hue.

Conjunctivitis - An inflammation of the palpebral conjunctiva, the lining of the upper and lower eyelids, and occasionally the bulbar conjunctiva, the layer of the conjunctiva over the sclera.

Convergence/convergence reflex - The result of action of the extraocular muscles turning the eyes inward or medially-nasally to focus on an object near at hand; together with accommodation, one of two essential components of near vision.

Denominator - The number below the bar in the Sloan notation. The denominator indicates the smallest line on an acuity chart (near or distance) successfully read by an examinee, or the distance from the chart or focal object for successful reading of the optotypes by an individual with no refractive error.

Diplopia - Double vision or the perception of two images, one by each fovea, experienced when the eyes are intentionally crossed or out of alignment due to imbalance of the extraocular muscles.

Distance vision - The ability of the eye to see images clearly at a distance (often a great distance). The inability to see a distant object clearly is called *myopia*.

Esophoria - A type of heterophoria in which the eye deviates inward or nasally when covered, that is, when fusion is suspended.

Esotropia - A type of strabismus in which one or both eyes deviate inward toward the nose from a parallel axis of vision. Also called *convergent strabismus*.

Exophoria - A type of heterophoria in which the eye deviates outward or laterally when covered, that is, when fusion is suspended.

Exotropia - A type of strabismus in which one or both eyes deviate outward away from the nose from a parallel axis of vision. Also called *divergent strabismus*.

Fovea - The area of the retina made up entirely of cones at the center of the macula, responsible for the very keenest vision.

Fusion - The union of two single images, one from each eye, into a single three-dimensional image within the occipital cortex.

Heterophoria - A latent alignment disorder in which the eyes are not parallel during monocular vision, that is, when only one eye is seeing and binocularity and fusion are disrupted. Also referred to as *phoria*.

Heterotropia - A manifest alignment disorder, or *strabismus*, in which one or both eyes deviate from parallelism when attempting to focus on a target while both eyes are open. Also referred to as *tropia*.

²⁸ Proctor, S.E. (2005). *Ibid.* pp.195 - 204.

Hypermetropia - A refractive error in which the light rays from an incoming visual image have not converged by the time they reach the retina. Used interchangeably with the term *hyperopia*. (Formerly called “farsightedness,” a sometimes confusing term no longer used.)

Hyperopia - A refractive error in which the light rays from an incoming visual image have not converged by the time they reach the retina. Used interchangeably with the term *hypermetropia*. (Formerly called “farsightedness,” a sometimes confusing term no longer used.)

Hypophoria - A type of heterophoria in which the eye deviates downward, when covered, while fusion is suspended.

Hypotropia - A type of strabismus in which one or both eyes deviate downward from a parallel axis of vision.

Legal blindness - Best-corrected central vision of 20/200 or less, and peripheral vision of 20 degrees or less.

Myopia - The most common of the refractive errors in which light rays from an incoming visual image converge before they reach the retina, or preretinally. (Formerly called “nearsightedness,” a confusing term no longer used.)

Near vision - The ability of the human eye to see objects with clarity at close range, also termed *near point acuity* or *near acuity*. Optimal near vision requires both accommodation and convergence.

Numerator - The number above the bar in the Sloan notation. The numerator indicates the distance the examinee is away from the chart.

Nystagmus - An involuntary, jerky movement of one or both eyes suggestive of primary ocular or systemic disease.

Occluder - An object that temporarily obstructs vision during vision screening or testing, preventing an eye from visualizing a focal target.

Ocular alignment - A positioning of both eyes by the extraocular muscles so they are targeting the same focal object simultaneously with the result that two images, one from each eye, fall on the respective foveae. The eyes are said to be *orthotropic* or *parallel*.

Ocular motility - The ability of the eyes to move together smoothly and fluidly, in all directions, at will.

Ocular tracking - The movement of the eyes together, at will, following a target in any direction. Also termed *tracking*.

Optotype - A focal image or target, very often letters or symbols on a chart, placed before the examinee’s eyes and used to discern visual functioning.

Plus lens - A convex lens used in the diagnosis and treatment of *hyperopia*, which refracts light when placed in front of the eye.

Pseudoisochromatic plates - A test of color vision that is a saturation test and a measure of the purity of color, which works by detecting false perception of color.

Sensitivity - The ability of a screening test to correctly identify those who actually have a disease, health problem, or condition.

Serif – The short lines stemming from and at any angle to the upper and lower ends of a letter.

Sloan letters chart - A vision acuity chart named after ophthalmologist, Dr. Louise Sloan, composed of ten letters of the Roman alphabet intentionally selected, placed, and ordered on the chart. Sloan letters are sans (without) serif and employ uniform fonts in all charts, and for this reason are now the preferred charts.

Snellen chart - The most common and well known of the vision acuity charts, named after its nineteenth century developer, Dr. Hermann Snellen. A modern version presents nine letters of the Roman alphabet in a font with serifs. Many charts in use are erroneously called “Snellen charts.” Snellen charts are no longer recommended because of the confusion with the discrimination of the serifs on the letters. (See Sloan chart)

Specificity - The ability of a test to correctly identify all those who do not have a disease, health problem or condition.

Stereopsis - Depth perception or three-dimensionality possible only when both eyes are in alignment and perceive the same image clearly.

Strabismus - A manifest deviation of one or both eyes from the visual axis of the other so they are not simultaneously directed to the same object. Also referred to as *heterotropia* or *tropia*.

Visual acuity - The state, condition, or effectiveness of central vision.

Web Links²⁹ (Sites checked and updated 12-28-05)

Primary Vision Information Web Sites

Healthy People 2010: Vision Objectives

Links to several national organizations concerned with the eye and vision.

www.healthypeople.gov

National Eye Institute

Information about eye conditions, research results, and vision education resources. Free materials are available upon request.

www.nei.nih.gov/

Prevent Blindness America

Formerly the National Society for the Prevention of Blindness. Provided community vision education, certified vision screening training, service programs, and national and state research.

www.preventblindness.org

Web Sites for General Vision Information

American Optometric Association

Public vision education and availability of eye care;

www.aoa.org

American Academy of Pediatrics

Position statements for professionals and guidelines for child vision care;

www.aap.org/healthtopics/visionhearing.cfm

Center for Health and Health Care in Schools

Operated by The George Washington University, School of Public Health and Health Services, Graduate School of Education and Human Development, Washington, DC.

Information on child health issues for school health professionals.

www.healthinschools.org

Center for Medicare and Medicaid Services

Information about Medicaid eligibility and current Federal Poverty Guidelines.

www.cms.hhs.gov/medicaid/eligibility

Children's Health Matters

Web site to assist with access to Medicaid and the State Children's Health Insurance Program (SCHIP); www.childrenshealthmatters.org/

Eye Resources on the Internet

Listing of resources compiled by the Association of Vision Science Librarians.

²⁹ Proctor, S.E. (2005). Ibid. p. 217.

<http://webeye.ophth.uiowa.edu/dept/websites/eyeres.htm>

The Foundation of the American Academy of Ophthalmology
Resources for vision education, eye care, and community outreach.
www.aaopt.org

Head Start Information and Publication Center: Health Services, Toolkit
A list of health services required within Head Start.
www.headstartinfo.org/infocenter/health_tkit.htm

Nemours Foundation: Your Child's Vision (in Kid's Health for Parents)
A newsletter for parents alerting them to signs and symptoms of potential vision problems in their child.
<http://kidshealth.org/parent/general/eyes/vision.html>

Vision Connection
Information about educational, governmental, or rehabilitative vision resources worldwide, with the capability of searching for local resources.
www.visionconnection.org/Content/HelpNearYou/default.htm

Vision Education Agency (VEA) Newsletter
A periodic publication of the Vision Education Agency about vision education.
www.pvi.org.nz

Resources for Children with Visual Impairments

American Foundation for the Blind – www.afb.org/

Blindness Links Directory – www.visionarysolution.com/links/html

Children's Disability Information; Vision Impairment Resources –
www.childrensdisabilities.info/vision/resources.html

Community Services for the Blind and Partially Sighted – www.csbps.com/

EnVision (publication) – www.lighthouse.org/about/education/newsletters.htm

Health Education Database –
www.seattlechildrens.org/child_health_safety/health_safety_resources/

Low Vision – Eye Wear Information – www.i-wear.org/low-vision.html

National Association for the Visually Handicapped (NAVH) – www.navh.org/

Sexuality Education for Children With Impaired Vision (book) –
www.tsbvi.edu/Education/sexuality-education.htm

Visual Efficiency Skills Curricula Resources – www.tsbvi.edu/bib/visual.htm

Vision Impairment and Blindness (National Library of Medicine and NIH) –
www.nlm.nih.gov/medlineplus/visionimpairmentandblindness.html

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Insert School Name/Logo

School Nursing

Escolar (School): _____

Estimados Padres de Familia,

Una evaluación de la vista fue realizada en su niño/a _____ Grado _____
Los resultados sugieren que a él/ella se le debe realizar un examen profesional por un especialista de la vista. Si las finanzas son una preocupación, por favor envíeme una nota. Ayuda financiera está disponible a través de varias agencias. Por favor lleve este formulario a su doctor de la vista para que lo llene y devuélvalo para nuestros expedientes. Sinceramente,

Enfermera escolar: _____, RN_ Teléfono: _____ Fecha: _____

Si su niño/a se encuentra bajo tratamiento de la vista, por favor hágame saber y devuélvame este formulario.

Firma del padre: _____ Fecha: _____

La siguiente información son los resultados de la evaluación de la vista:

[] VISIÓN de retirado (Far): OJO derecho (Rt.): 20/ OJO izquierdo (Lt.): 20/ AMBOS ojos (Both): 20/

[] VISIÓN de cerca (Near) prueba de 2+ lentes: Derecho (Rt.): PASÓ/ NO PASÓ Izquierdo (Lt.): PASÓ/ NO PASÓ

[] Se Sospecha un Problema usando Ambos Ojos Conjuntamente: (prueba Stereo Fly)

[] Preocupacion de COLOR de la VISIÓN: _____

[] OBSERVACIÓN Externa: _____

[] **SU NIÑO NO LLEVABA SUS ANTEOJOS** al momento de la evaluacion (no glasses at screening).

[] Su NIÑO ESTUVO AUSENTE Para la evaluacion y no sers evaluado en la escuela a menos que usted contacte a la enfermera escolar (student absent).

[] Nosotros No Pudimos evaluar a su nino/a. Si usted tiene resultados recientes de la vista, por favor comparta estos resultados para el expediente escolar de su nino/a (Could not test).

[] Esta es la SEGUNDA CARTA DE REFERENCIA que se le ha enviado sobre estos resultados (Second Letter).

[] OTRO (Other). _____

Estimado Doctor, por favor, complete la siguiente information y regresela a la regresela a la enfermera escolar (Doctor, please complete and return to the school nurse).

DIAGNÓSTICO (Diagnosis): _____

¿Se recetaron anteojos (Glasses Rx'd)? _____

¿Cuando deben usarse los anteojos (When are glasses to be worn)? _____

¿Otras Consideraciones/Comentarios (Comments)? _____

DOCTOR _____ FECHA (Date) _____

Adapted from Colorado Springs School District #11

Insert School District Name/Logo

School: _____

Dear Parent,

A vision screening was done on your child _____ grade _____. The results suggest that your child would benefit from a professional eye exam by an eye specialist.

If finances are a concern and you do NOT have insurance, please give the school nurse a call or send the nurse a note to school. Financial assistance may be available through various agencies.

Please take THIS form to the eye specialist for completion and return it to me for our records.

Sincerely,

School Nurse: _____ Pager/Phone: _____ Date: _____

If your child is already under vision treatment, please inform the school nurse below and return this form.

Parent Signature/Name: _____ Date: _____

The Vision screening results were as follows:

___ Far Vision : Right Eye: 20/___ Left Eye: 20/___ Both Eyes: 20/___

___ Near Vision: Right Eye: Pass/Fail Left Eye: Pass/Fail

___ Suspected problem using both eyes together (stereo fly test)

___ Color vision concerns: _____

___ External observation: _____

___ Your child was NOT wearing their glasses for this screening.

___ Your child was absent for screening and will not be screened at school unless you contact your school nurse.

___ We were unable to screen your child. If you have any recent vision results, please bring a copy to your school nurse.

___ This is the SECOND referral letter you have been sent on these results.

___ Other: _____

Dear Doctor, Please complete the following and have the parent return this form to the school nurse. Thank you!

Diagnosis: _____

Were glasses prescribed? _____

When are glasses to be worn? _____

Other comments? _____

Doctor Name/Signature: _____ Date: _____