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# **A study of the effectiveness of teacher training for identification of students with visual problems**

## **Abstract**

Six elementary school teachers identified students in their classes they felt had visual problems. The teachers were then given instructions about the visual system and ten days to observe their students. Another selection of students with visual problems was made after the observation period. All students were screened and the sensitivity of three teachers improved while that of the other three did not. Teacher motivation was indirectly measured by class participation and the three teachers who became more sensitive were also the ones deemed more motivated due to high class participation. To increase teacher motivation we suggest strong administration support and providing the training during regularly scheduled inservice times in order to avoid increasing the burden on already overworked teachers.

## **Degree Type**

Thesis

## **Degree Name**

Master of Science in Vision Science

## **Committee Chair**

Donald O. Schuman

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A STUDY OF THE EFFECTIVENESS OF TEACHER TRAINING FOR  
IDENTIFICATION OF STUDENTS WITH VISUAL PROBLEMS

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FOREST GROVE, OREGON

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MATTHEW R. PERRY

Matthew Perry graduated with honors from Oregon College of Education in 1979 with a B.S. in elementary education. After graduation he taught fifth grade in Beaverton, Oregon for three years. Matt is in his fourth year at Pacific University College of Optometry and intends to be very involved in the identification and treatment of children's vision problems in professional practice.

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## ABSTRACT

Six elementary school teachers identified students in their classes they felt had visual problems. The teachers were then given instructions about the visual system and ten days to observe their students. Another selection of students with visual problems was made after the observation period. All students were screened and the sensitivity of three teachers improved while that of the other three did not. Teacher motivation was indirectly measured by class participation and the three teachers who became more sensitive were also the ones deemed more motivated due to high class participation. To increase teacher motivation we suggest strong administration support and providing the training during regularly scheduled inservice times in order to avoid increasing the burden on already overworked teachers.



# A STUDY OF THE EFFECTIVENESS OF TEACHER TRAINING FOR IDENTIFICATION OF STUDENTS WITH VISUAL PROBLEMS

Matthew R. Perry  
Donald O. Schuman, O.D.

KEY WORDS: Children, teacher observations, training, screening

## INTRODUCTION

Our public schools are staffed with dedicated teachers and administrators who are trying to provide the best possible education to a diverse population of students. From the physically and mentally handicapped to the gifted students, the law guarantees an equal education for all. Combine this factor with the increasing difficulty of obtaining public financing for schools and you have a society placing tremendous demands on the entire public school system. School financing and curriculum development are large scale problems that will be left to teachers and administrators with expertise in these areas. The principal investigator's teaching experience in the elementary classroom and subsequent optometric training spawned this research in an attempt to provide another tool for more efficient education in our schools.

During my three years as a fifth grade teacher I constantly wrestled with the problem of maximizing the direct contact I had with each student. Ideally, every child would have had an educational program tailored specifically to his or her needs taking into account developmental and intellectual differences. The reality of the situation dictates that students be taught in groups. Teaching in groups can and is done effectively but one of the keys to success lies in the homogeneity of the groups. Academic variation among students reduces homogeneity and leads to a greater subgrouping of students. As the number of groups increases the amount of time each student gets direct instructional contact with the teacher decreases.

Optometry's role in education is to eliminate poor visual information processing as being a differentiating factor between students<sup>1</sup>. In other words, developing visual information processing skills in students so educational programs don't have to be modified for them, thus reducing the number of groups in a teacher's classroom. The fewer groups a teacher must attend to the more time he or she may spend with each group.

It has been estimated that 80% of school tasks are based on vision<sup>2</sup>. This is in accordance with Gesell's observations that the demands upon the eyes of growing children are multiplying and intensifying<sup>3</sup>. A small number of students have visual deficiencies that are the sole cause of their learning problems but many may have visual deficiencies that are contributing to their learning problems<sup>4</sup>. It is clear that identification and therapy for students with visual impairments can be critical to a student's success<sup>5</sup>.

Therapy for visual problems is conducted by trained eye care professionals who specialize in children's organic and functional vision. The identification of students with vision problems in school is done to varying degrees. The most common mode of identification in schools consists of screenings. The scope of these screenings varies from minimum programs consisting of distance acuities to comprehensive programs with a battery of tests to assess all appropriate aspects of the visual system<sup>8,9,10,11</sup>. These screenings result in referrals for a complete examination by a vision care specialist. Screenings are a red flag system and without them many children are left in want of regular care<sup>12</sup>.

Since screenings vary in content as well as periodicity, the classroom teacher can play a key role in identifying students with visual problems<sup>2,4,13,14</sup>. The elementary teacher often spends more time in contact with a child than parents do on a day to day basis. Most certainly the teacher can observe the child during intense visual demand situations more often than any other adult<sup>15</sup>. It is essential that teachers understand the development of normal vision and be able to recognize

deviations<sup>2</sup>. The recognition and subsequent therapy of visual deficient students should benefit all involved by eliminating one factor of variability between students and reducing the likelihood of underachievement by students.

A previous study has shown teacher observation to be inefficient for screening purposes<sup>5</sup>. The teachers tended to over refer. The only assistance the teachers received in making their selections was a brief one page outline containing some signs and symptoms of visual problems. It seems logical that the rate and accuracy of teacher referrals is dependent upon the teacher's knowledge. It is important teachers understand the basic structure, function and anomalies of vision as well as behaviors caused by the anomalies. This study examined the effects of teacher training on the ability of teachers to identify children with visual deficiencies.

## METHODS

Six teachers, one from each grade level, of a XXXXXXXXXX, Oregon elementary school volunteered to participate in this study. All students in the six teachers classes had the potential to be included in the study pending parental consent. Seventy-eight percent of the parents consented and 110 students were involved in the research.

The research can be broken down into five steps. The first step was the teachers' selections of students they felt, based on previous knowledge, had a visual problem that should be investigated. The teachers did this by circling names on their respective class lists.

The second step was my hour and a half presentation to the teachers about the visual system. The basic structure and function of the visual system was covered first. Then the anomalies of the developing visual system were covered emphasizing the behavioral manifestations of the anomalies. The specific areas covered by the end of the training session are in appendix A.

The third and longest phase of the research was the teachers observations of their respective students. Ten school days were given for observation by the teachers as they performed their regular teaching duties. A guide to signs and symptoms of visual problems was given to teachers as a reference. This guide can be found in appendix B. The teachers were encouraged but not required to keep brief written records of behaviors observed. The observation recording form can be found in appendix C.

The fourth step was the post-training and post-observation selections by the teachers. The teachers again circled the names of students they felt had visual problems, worthy of further investigation, on their class lists.

The final step was to perform a visual screening on the students who received consent to participate in the study from their parents. The screening was conducted by fourth year optometry students from Pacific University. All six classes were screened at the elementary school on a single day. Each student was seen for approximately fifteen minutes. As the principal investigator, I conducted the teacher training and collected the pre and post-training teacher selections. I did not administer any tests during the screening and the screeners had no access to the teachers' selections. The testing protocols and screening recording forms can be found in appendix D and E respectively.

## RESULTS

The referrals from the visual screening were used to judge the teachers ability to identify children with visual problems. The nominal data was analyzed using the chi square statistical analysis. The nominal variable was the teacher training and the data fell into one of the following categories: hits (correct referrals), misses (incorrect nonreferrals), correct rejections (correct nonreferrals), false alarms (incorrect referrals).

Failure to meet the screening criteria on one or more of the following screening tests was considered a referral. Near and far visual acuities, near and far cover test, wirt circle stereo test, bead skills, near point of convergence, distance retinoscopy, and ophthalmoscopy. The overall referral rate of the screening was 31.8 percent. Chi square statistical analysis rejected the following null hypothesis at the .0001 confidence level; teachers will show no difference in success of

identifying students with visual problems before and after training on the visual system. The contingency table for the chi square analysis can be found in table 1. Table 2 displays the emperical data on a teacher by teacher basis as well as for the group.

## DISCUSSION

The chi square analysis yields a misleading value in this case. The final value is confounded due to the combination of positive and negative factors in the same contingency table. Increasing hits and decreasing misses are positive results. Increasing false alarms and decreasing correct rejections are negative factors. When combined into the same contingency table the resulting chi square value easily gains significantants but contains information showing increasing and decreasing sensitivity on the part of the teachers.

A solution to this delemma is to assign values to each of the possible results. The values would have to be arbitrarily set based on the worth of identifying students with visual porblems and the damage of over referrals. Since the values would be so dependent on our personal opinions and biases we reject this solution.

Using emperical data we can address the factor of teacher interest and motivation. It is reasonable to believe that students could directly and indirectly sense their teacher's feelings about the importance of returning the informed consent forms. We have no intention of questioning the sincerity or abilities of any of the teachers who gracously voluntered and took time out of an already busy schedule to participate in this research. We would, howerer, like to suggest that their level of class participation indirectly reflects their level of interest and motivation.

To explore this idea further we assigned letter names A through F to the teachers based on percentage of class participation. We then divided the teachers into two groups based on these percentages. Teachers A, B and C had participation rates of 92, 92 and 86 percent respectively. Teachers D, E and F had rates of 71, 67 and 59 percent respectively. Teachers A, B and C increased their number of referrals by 11 after training. The number of hits in those 11 referrals was six. Teachers D, E and F increased their number of referrals by six but only one of the six was a hit. This leads us to believe that more highly motivated teachers became more sensitive observers.

As with the Orinda study the teachers did over refer but our more sensitive teachers had a better than one to one ratio of increased hits to increased over referrals. The last point that should be made is that dispite the impressive increase in sensitivity of teachers A, B and C they still, as a group, missed 15 students with visual problems.

## CONCLUSIONS

Teacher sensitivity to visual problems of their students can be increased but motivation seems to be a key factor. To increase the motivation of the teachers school administration should support the training program by providing the training during inservice days. Putting the training into an existing program rather than adding it to the teachers already full schedule should make the teachers more receptive. While it is clear sensitivity can be increased it is equally clear that training cannot replace screenings due to the significant number of students with visual problems the teachers missed. It is a huge task to screen all students in all grade levels every year. Some school districts screen all of the first and fourth graders each year. Teacher training and subsequent identifications by the teachers would be a valuable ally to the screenings. Any students in grades two, three, five and six suspected by the teachers could be screened with the first and fourth graders.

If further studies similiar to this are conducted we feel that increased numbers of students and teachers should be used. The training should be reviewed and possibly increased. The key to success could be based on making the training part of an existing program and not an added demand on the teachers time.

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## APPENDIX A

### TEACHER TRAINING SUBJECT OUTLINE

- I. Development of the eye
  - A. Tissue type
  - B. Growth rate
- II. Basic structure and function of the eye
  - A. Sclera
  - B. Cornea
  - C. Iris
  - D. Lens and Ciliary body
  - E. Aqueous and Vitreous
  - F. Retina
  - G. Extraocular muscles
- III. Vision vs. Sight
- IV. Anomalies of the visual system
  - A. Refractive error
    - 1. Myopia
    - 2. Hyperopia
    - 3. Astigmatism
    - 4. Anisometropia
    - 5. Amblyopia
  - B. Eye tracking problems (Oculomotor skills)
  - C. Eye focusing problems (Accommodative skill)
    - 1. Amplitude
    - 2. Facility
    - 3. Accuracy
    - 4. Maintenance
  - D. Eye teaming problems (Binocularity)
    - 1. Heterotropia
    - 2. Heterophoria
    - 3. Sensory fusion
    - 4. Motor fusion
    - 5. Stereopsis
  - E. Hand-eye coordination problems
  - F. Visual form perception problems

## APPENDIX B

### OBSERVABLE CLUES TO CLASSROOM VISION PROBLEMS

1. Appearance of Eyes
  - \*One eye turns in or out at any time
  - \*Reddened eyes or lids
  - \*Eyes tear excessively
  - \*Frequent sties on lids
2. Complaints When Using Eyes at Desk
  - \*Headaches in forehead or temples
  - \*Burning or itching after reading or desk work
  - \*Nausea or dizziness
  - \*Print blurs after reading a short time
3. Behavioral Signs of Visual Problems
  - A. Eye Movement Abilities (Ocular Motility)
    - \*Head turns as reads across page
    - \*Loses place often during reading
    - \*Needs finger or marker to keep place
    - \*Display short attention span in reading or copying
    - \*Too frequently omits words
    - \*Repeatedly omits "small" words
    - \*Writes up or down hill on paper
    - \*Rereads or skips lines unknowingly
    - \*Orients drawings poorly on page
  - B. Eye Teaming Abilities (Binocularity)
    - \*Complains of seeing double (diplopia)
    - \*Repeats letters within words
    - \*Omits letters, numbers, or phrases
    - \*Misaligns digits in number columns
    - \*Tilts head extremely while working at desk
    - \*Consistently shows gross postural deviations at desk activities
  - C. Refractive Status (Nearsightedness, Farsightedness, Focusing, etc.)
    - \*Comprehension reduces as reading continued; loses interest too quickly
    - \*Mispronounces similar words as continues reading
    - \*Blinks excessively at desk tasks and/or reading; not elsewhere
    - \*Holds book too closely; face too close to desk surface
    - \*Avoids all possible near-centered tasks
    - \*Complains of discomfort in tasks that demand visual interpretation
    - \*Closes or covers one eye when reading or doing desk work
    - \*Makes errors in copying from chalkboard to paper on desk
    - \*Makes errors in copying from reference book to notebook
    - \*Squints to see chalkboard, or requests to move nearer
    - \*Rubs eyes during or after short periods of visual activity
    - \*Fatigues easily; blinks to make chalkboard clear up after desk task

Source: ERIC Fact Sheet  
ERIC Clearinghouse on Handicapped and Gifted Children  
1920 Association Drive, Reston, Virginia 22091  
1981



## APPENDIX D

### A Study of the Effectiveness of Teacher Training for Identification of Students with Visual Problems

#### Testing Protocols

Advisor: Donald O. Schuman O.D.  
Principal Investigator: Matthew R. Perry

Pacific University  
College of Optometry

October, 1986



## Visual Screening Protocols

The abbreviations used in the protocols are as follows:

- E: Evaluates. Definition of the primary ability evaluated by the test.
- TD: Testing distance.
- IL: Illumination level.
- P: Position of subject
- CF: Critical factors to be observed in administering the test.
- C: Criterion level required to differentiate pass vs. fail.
- CS: Criterion source. Source from which criterion levels derived.
- IS: Instructional Set. IS should be presented nearly verbatim to maintain consistent test standards.
- R: Recording. How to record data, what data should be recorded.
- S: Subject.

## Testing Protocols

The following pages outline the testing protocols for each test used in the screening phase of the thesis project: *A study of the Effectiveness of Teacher Training to Identify Students with Visual Problems*. All screeners will be given a copy of these protocols and asked to study them carefully. This is an attempt to make the screening as consistent as possible.

The screening will be set up in stations:

- Station A (2) Far Snellen visual acuities
  - Cover test, near and far
- Station B (3) Near Snellen visual acuities
  - Titmus stereo test
- Station C (2) Bead skills
  - NPC
  - MEM retinoscopy
- Station D (2) Accommodative rock
  - Prism rock
- Station E (3) Retinoscopy
  - Ophthalmoscopy

Each screener will be assigned to one station for the duration of the screening. This is an attempt to provide consistency, especially when subjective evaluations are made on the part of the screener as in eye movements and retinoscopy.

## SNELLEN VISUAL ACUITY

- E: Clarity of vision, visual discrimination ability.
- TD: 6m, 40cm.
- IL: Standard room. (34-79 footcandles)
- P: Sitting relaxed.
- CF: Testing sequence; OD,OS. S will wear habitual far point Rx. If examiner feels S is not calling letters due to inability to decode letters, Lighthouse cards will be used to determine acuity.
- C: Worse than 20/30, either eye.
- CS: Pacific University College of Optometry vision screening program, criteria for referral.
- IS: "Please call the smallest row of letters that you can see. Guess on any letters that aren't completely clear to you."
- R: Record BVA plus the number of letters called from the next finer acuity line or minus the number of letters called incorrectly from the recorded line. Note if Lighthouse cards were used. Record pass or fail.

## COVER TEST

- E: Presence and magnitude of phoric or tropic posture.
- TD: 6m, 40cm.
- IL: Standard room. (34-79 footcandles)
- P: Sitting relaxed.
- CF: Insure that S is attending to designated target and that S is instructed to keep the target clear. Target at 6m: 20/40 VA demand letter. Target at 40cm: near distance test bead (3/16" diam). S is wearing habitual Rx. Prisms will be used to quantify magnitude.
- |             |                |                 |
|-------------|----------------|-----------------|
| C:          | 6m             | 40cm            |
| Tropia      | any            | any             |
| Esophoria   | $\geq 5\Delta$ | $\geq 5\Delta$  |
| Exotropia   | $\geq 5\Delta$ | $\geq 10\Delta$ |
| Hyperphoria | $\geq 2\Delta$ | $\geq 2\Delta$  |
- CS: Pacific University College of Optometry vision screening program, criteria for referral.
- IS: "Look at the target and keep it clear."
- R: Record whether phoric or tropic response, direction of phoria or tropia, and estimated magnitude of phoria or tropia. Record pass or fail.

## TITMUS STEREO TEST

- E: Stereopsis. Binocularity.  
TD: 40cm  
IL: Standard room. (34-79 footcandles)  
P: Sitting relaxed.  
CF: Poloroid glasses must be worn over habitual near Rx , head must be straight,and both eyes must remain open at all times. If it is perceived that the child is failing due to laterality problems have them point to the circle that looks like it is closer to them than the other two.  
C:  $\geq 8$  to pass. (50 arcseconds)  
CS: Criteria used in NYSOA screening battery.  
IS: Direct S attention to the first box. "Which circle looks like it is closer to you than the other two?"  
R: Pass or fail.

## BEAD SKILLS

- E: Oculomotility  
TD: 40cm  
IL: Standard room. (34-79 footcandles)  
P: Sitting relaxed  
CF: Head must remain stationary. Bead size is 3/16" diameter. Bead moved at a rate of 6-8"/sec. S wearing habitual Rx.  
C: Can't reach/grasp/release on saccades, excessive head movement or gross deviations on pursuits and/or rotations.  
CS: Class notes: Basic Visual Training, Opt 537, Dr. Paul Kohl O.D., Pacific University College of Optometry,1985.  
IS: "Watch the bead using only your eyes. Do not move your head."  
R: Pass or fail. This test result is based on the subjective observations of the screener. Qualitative observations of smoothness, accuracy, and consistency of EM throughout all cardinal positions of gaze.

## NEAR POINT OF CONVERGENCE

- E: Near point of convergence  
TD: Start at 40cm.  
IL: Standard room. (34-79 footcandles)  
P: Sitting relaxed  
CF: Head positioned straight toward screener. Habitual near Rx worn.  
C:  $\geq 4$ " break,  $\geq 6$ " recovery.  
CS: Pacific University College of Optometry vision screening program,

criteria for referral.

- IS: "Watch my bead carefully as I move it toward your nose. Keep the bead clear, and tell me if you ever see what appears to be two beads.....Now tell me when the bead appears to be single again."  
R: Break and recovery in inches and pass or fail.

#### MEM RETINOSCOPY

- E: Accommodative posture relative to fixation plane.  
TD: 40cm with string attached to retinoscope - child holds other end to chin.  
IL: Standard room. (34-79 footcandles)  
P: Sitting relaxed.  
CF: Target is 20/300 number card. S wears no glasses or habitual Rx. Nondominant eye is scoped. Nondominant eye is defined as being the first eye to deviate on NPC test. ( NPC break and recovery findings are performed by the same examiner who performs MEM.) If the S breakpoint is to the nose, the S will be asked which hand they used for writing. That hand will be considered the dominant hand and the corresponding contralateral eye the nondominant eye. The nondominant eye will be neutralized by rapidly interposing a +1.25D lens at the spectral plane as the streak moves quickly across the eye. This monocular measurement is made quickly so as to minimize the effect of the measuring lens. If there is neutrality or "with" motion while the +1.25D lens is in place the S fails the test.  
C:  $\geq 1.25D$  lag of accommodation.  
CS: McManus, R.L., *Monocular Estimate Method (MEM) of Nearpoint Retinoscopy in First and Fourth Grade Population*. Thesis, Pacific University College of Optometry, 1985.  
IS: "Can you read the big numbers on my card? I am going to be flashing this light in front of your eyes and I want you to start at the top and read each of the numbers outloud."  
R: Pass or fail.

#### ACCOMMODATIVE LENS ROCK

- E: Accommodative facility: The ability to stimulate and relax accommodation while convergence demand is held constant.  
TD: 40cm  
IL: Standard room. (34-79 footcandles)  
P: Sitting relaxed.  
C: Grades 1,2,3: 3 cycles in 30 seconds to pass

Grades 4,5,6: 5 cycles in 30 seconds to pass

- CF: Habitual near Rx worn. Both eyes open at all times. Examiner holds and flips lenses. Target is double spaced pica size print on white paper.
- CS: Lang, T.R., McBride, T.J., *Accommodative Rock: A Normative Study on a Grade School Population*, Thesis, Pacific University College of Optometry, 1985.
- IS: Hold the flipper with the plus lens in front of S eyes. "While I hold these lenses in front of your eyes, can you read the first letter of this row to me?" Practice like this until the S understands the procedure. "Now I'm going to time you for 30 seconds, and I want you to read the letters just as soon as they become clear."
- R: Record the number of cycles in 30 seconds. The score is determined by counting the total number of letters called out, omitting the mistakes or omissions and adding repetitions. Cycles = flips ÷ 2. Record pass or fail.

#### PRISM ROCK

- E: Facility in changing vergence posture while maintaining accommodative posture for clarity of a 20/30 VA demand letter at a distance of 40-50cm.
- TD: 40cm.
- IL: Standard room. (34-79 footcandles)
- P: Sitting relaxed.
- CF: Test distance must remain constant throughout testing. S should be exposed to demo of prism effects to insure ability to fuse through the 8<sup>Δ</sup> BI/BO testing prisms. S should be emphatically directed to keep the print clear at all times. Target should be pica size print on white paper. The tester will flip the prism. Both eyes must be kept open at all times. S habitual Rx is worn. The screener should watch S eyes for break and recovery movements to monitor suppression.
- C: Grades 1,2,3: 3 cycles in 30 seconds.  
Grades 3,5,6: 4 cycles in 30 seconds.
- CS: Karman, S., Sison, N., *Prism Rock: A Normative Study on a Grade School Population*, Thesis, Pacific University College of Optometry, 1985.
- IS: "Look through these lenses (BO) until the letters become single and clear, then call out the first letter." Flip to BI. "Each time I flip the lens like this I want you to make the letters single and clear and call out the next one in the row. We'll do this for 30 seconds just like the last test you did."

R: Record the number of cycles in 30 seconds. The score is determined by counting the total number of letters called out, omitting the mistakes or omissions and adding repetitions.  $\text{Cycles} = \text{flips} \div 2$ .  
Record pass or fail.

#### BAR RETINOSCOPY

E: Refractive condition.

TD: 6m.

IL: Dim.

P: Sitting relaxed.

CF: Over refraction with habitual Rx and S looking at far.

C: Hyperopia  $\geq +1.50\text{D}$

Myopia  $\geq -0.75\text{D}$  with acuity loss

Astigmatism  $\geq 1.00\text{D}$

Anisometropia  $\geq 1.00\text{D}$

CS: Pacific University College of Optometry vision screening program, criteria for referral.

IS: "I would like you to watch the cartoon while I shine this light in front of your eyes. It is important that you watch the cartoon and not my light." If the child still seems to be looking at your light ask them questions about the cartoon.

R: Refractive correction in minus cylinder form. Record pass or fail.

#### OPHTHALMOSCOPY

E: Ocular health.

TD: Have the S fixate on any convenient distant object.

IL: Dim

P: Sitting relaxed

CF: Use consistent search pattern when looking at the fundus.

C: Any varied pathology or medical abnormality of eye and/or adnexa.

CS: Pacific University College of Optometry vision screening program, criteria for referral.

IS: "I'm going to shine a light in your eye, it will seem to be too bright but it is in no way harmful. I need you to look at (choose a convenient distant object) and try to keep looking towards it even if my head blocks your view."

R: In the case of failures: Identify pathology as accurately as possible.

APPENDIX E

VISUAL SCREENING RECORDING FORM

NAME \_\_\_\_\_ AGE \_\_\_\_\_ GRADE \_\_\_\_\_ TEACHER \_\_\_\_\_

SNELLEN VISUAL ACUITIES

Far: OD 20/ OS 20/ P F  
 Near: OD 20/ OS 20/ P F

COVER TEST

Far: Tropia \_\_\_\_\_ Phoria Vert \_\_\_\_\_ Phoria Horz \_\_\_\_\_ P F  
 Near: Tropia \_\_\_\_\_ Phoria Vert \_\_\_\_\_ Phoria Horz \_\_\_\_\_ P F

TITMUS STEREO TEST

Number reached correctly \_\_\_\_\_ P F

BEAD SKILLS

Pursuits \_\_\_\_\_ Rotations \_\_\_\_\_ Saccades \_\_\_\_\_ P F

NEAR POINT OF CONVERGENCE

B/R \_\_\_\_\_" / \_\_\_\_\_" P F

MEM RETINOSCOPY

Lag \_\_\_\_\_<sup>D</sup> P F

ACCOMMODATIVE ROCK ( $\pm 2.00^D$ )

Cycles in 30 seconds \_\_\_\_\_ P F

PRISM ROCK ( $8^\Delta$  BI/BO)

Cycles in 30 seconds \_\_\_\_\_ P F

RETINOSCOPY

OD \_\_\_\_\_ P F  
 OS \_\_\_\_\_

OPHTHALMOSCOPY

Pathology \_\_\_\_\_ P F  
 \_\_\_\_\_

