

# Vision and Reading Support Seeing Past 2020

*New Approaches in Education and Vision Services*



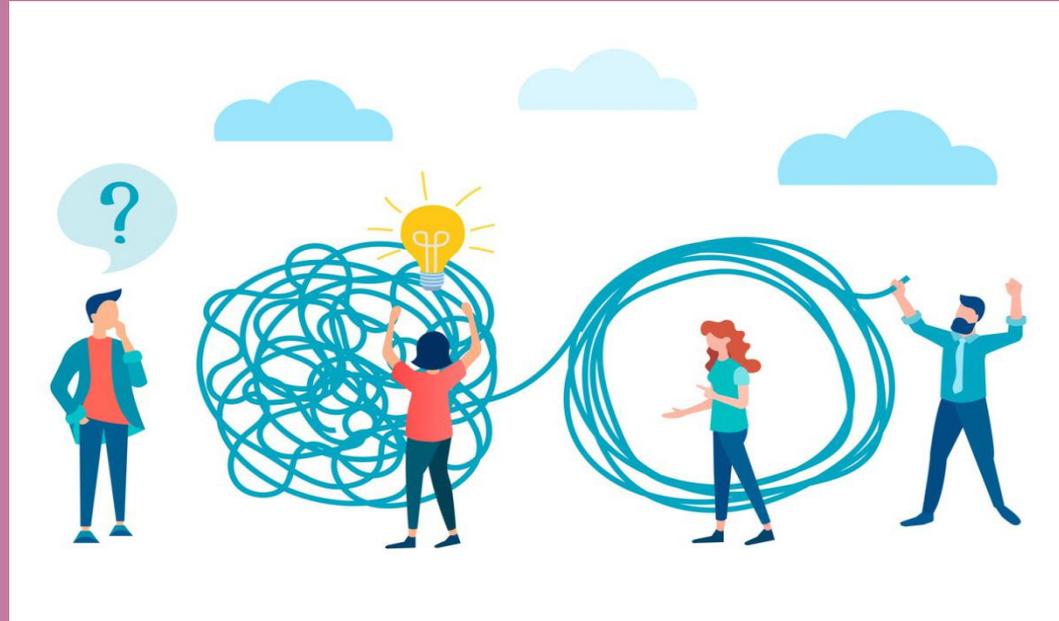
# Housekeeping:

- Michael Wright, MA Special Education, Teacher of the Blind and Visually Impaired
- National Program Coordinator for Solutions in Low Vision and also for Advocates for Blind Citizens
- Solutions in Low Vision contracts with parents, schools, post-acute care providers and companies that promote improved vision services
- Advocates for Blind Citizens is a non-profit that works with many tax exempt organizations promoting improved services for the blind
- Our programs are provided to school districts for a reduced rate, often subsidized by sponsors, such as local Lions Clubs.



# We are going to address...

- “Vision” in the Learning Environment
- Vision and Regular Education
- Vision Screening
- Vision and Special Education



# Vision in the Learning Environment

80% of what children learn in elementary classrooms has a visual component



**“80% of Classroom Learning is Visual: Addressing the Long-Term Learning Impacts for Children with Vision Problems”,  
-Elizabeth Hawkins Lincoln, MA Harvard University**

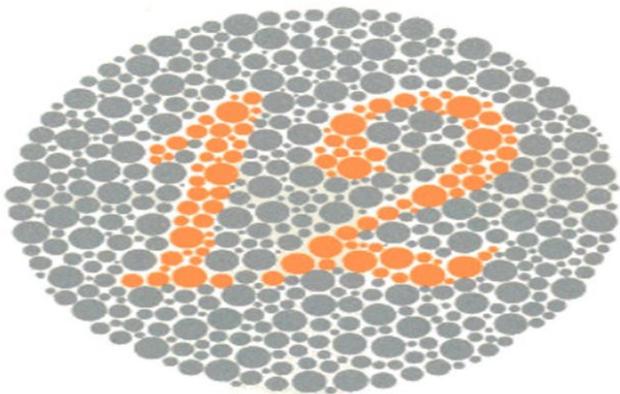
# Vision in the Learning Environment

“Color carries critical importance in the development of children’s cognitive skills. Colors are some of the earlier words they tend to learn and a means they can use for learning.”



“The Importance of colors for child development”, Color Matters and Development, Psychology Today, Meng 2022.

1 / 27



**Next**

### Instructions

This test should take under 10 minutes (most people complete it under 5) and consists of 24 questions.

If you see a number, please type the number you see in the text field below the color plate.

If you see a line drawing (rather than a number), please choose the image that most closely resembles the drawing.

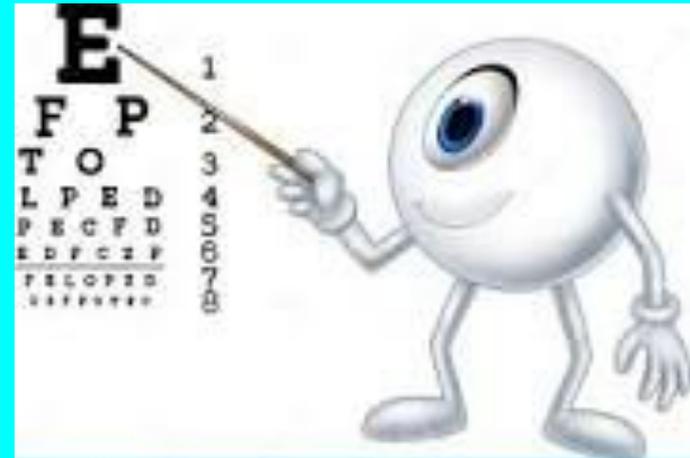
If you normally wear contacts or glasses, please feel free to wear or not wear them (according to your preference), while taking the test.

# Vision and Regular Education



# Vision Screening

- Traditional Vision Screening:
  - *Most states only require acuity measurements*
  - - Children often “cheat” the test
    - Lighting is frequently disregarded
    - Acuity tests alone miss several important issues to watch for



# Vision Screening

## Traditional Vision Screening:

- *Accuracy of Acuity measurements*

94% specificity

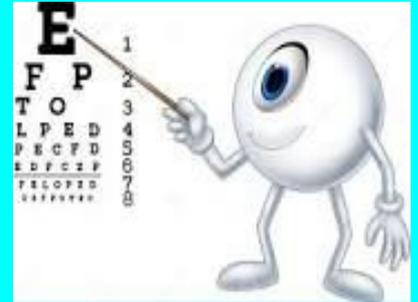
44% Sensitivity

- *Accuracy of Photoscreening*

88% specificity

91% Sensitivity

*(J. Vaughn, Oregon Health Sciences University, 2017 and Journal of Pediatric Ophthalmology and Strabismus, 2019)*



# Photoscreening

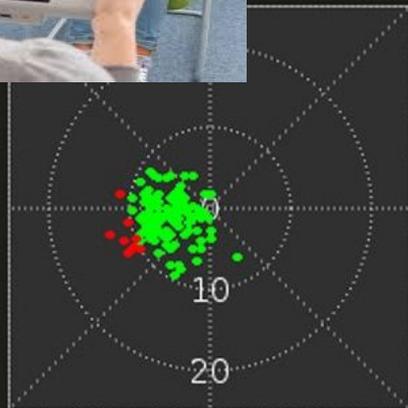


# Photoscreening





Emily Smith



**+2.75**

SE  
[dpt]

**+0.50**

**-1.75**

CYL  
[dpt]

**-0.50**

**4.2**

Ø  
[mm]

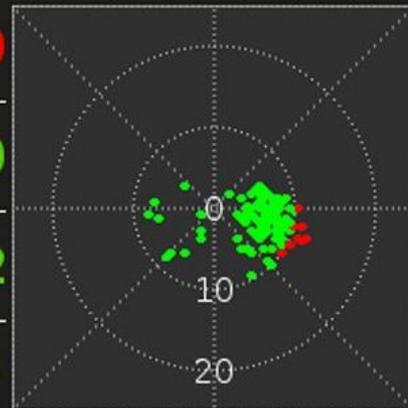
**4.2**

ASY

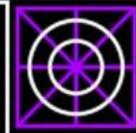
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**2.4**

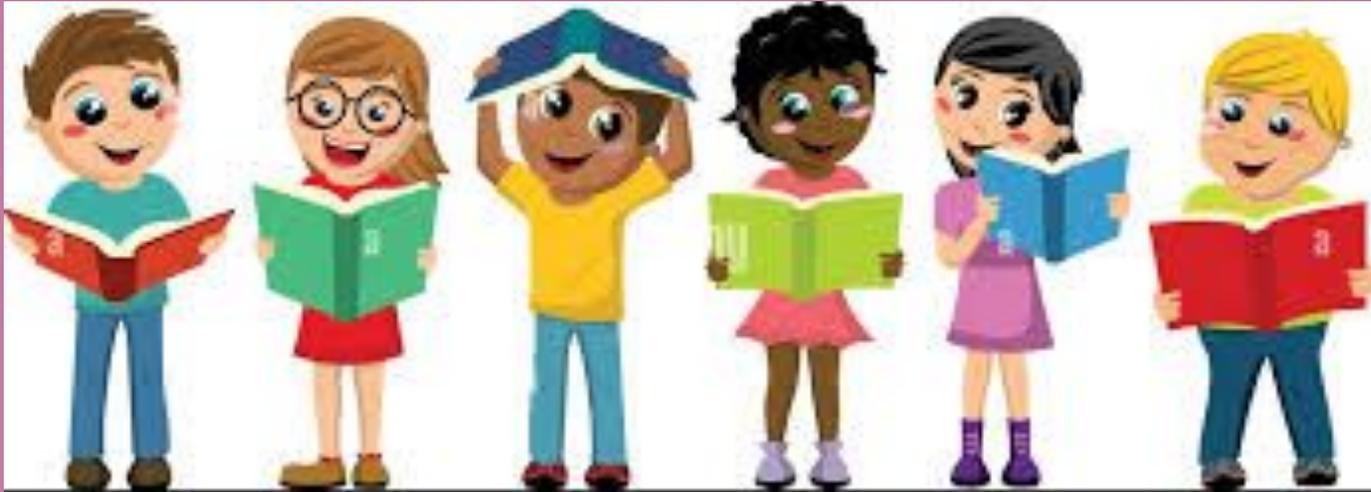
OS



**Refer**



# Vision and Reading Support



Concern: Child isn't reading well, but doesn't need glasses.



Concern: Child isn't reading well, but doesn't need glasses.

The doctor will often discuss with the parents that the issue isn't with the child's vision, but there is likely a learning disability.



70% of school-age children with a learning disability have a systemic or functional vision problem.



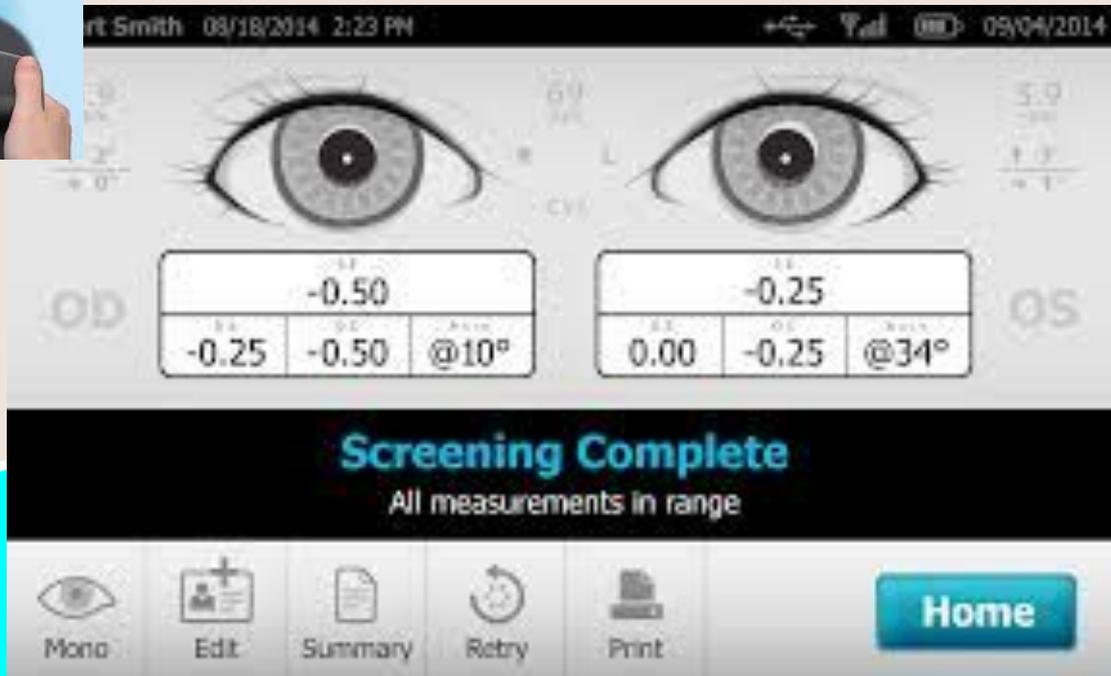
Bryson McCool, Founder of the New Mexico Lions KidSight program, 2024.

70% of school-age children with a learning disability have a systemic or functional vision problem.

Some children with terrific vision are among the most likely to need reading intervention.

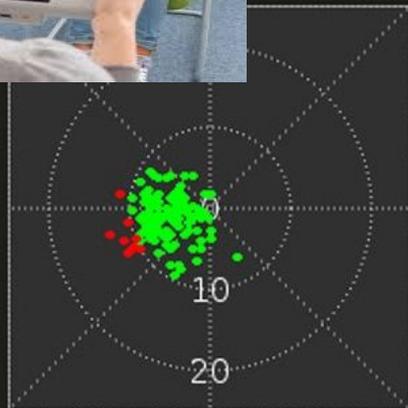


# Photoscreening Results





Emily Smith



**+2.75**

SE  
[dpt]

**+0.50**

**-1.75**

CYL  
[dpt]

**-0.50**

**4.2**

Ø  
[mm]

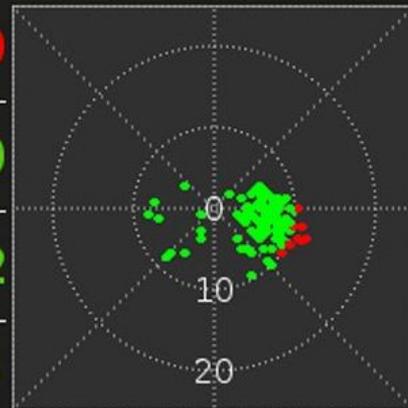
**4.2**

ASY

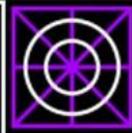
[°]

**2.4**

OS



**Refer**





# Ocular Dominance

The Dominant Eye Test:

Create a triangle with your forefingers and thumbs.

With both of your eyes open, center this triangle on an object in the distance.

Close your left eye.



# Ocular Dominance



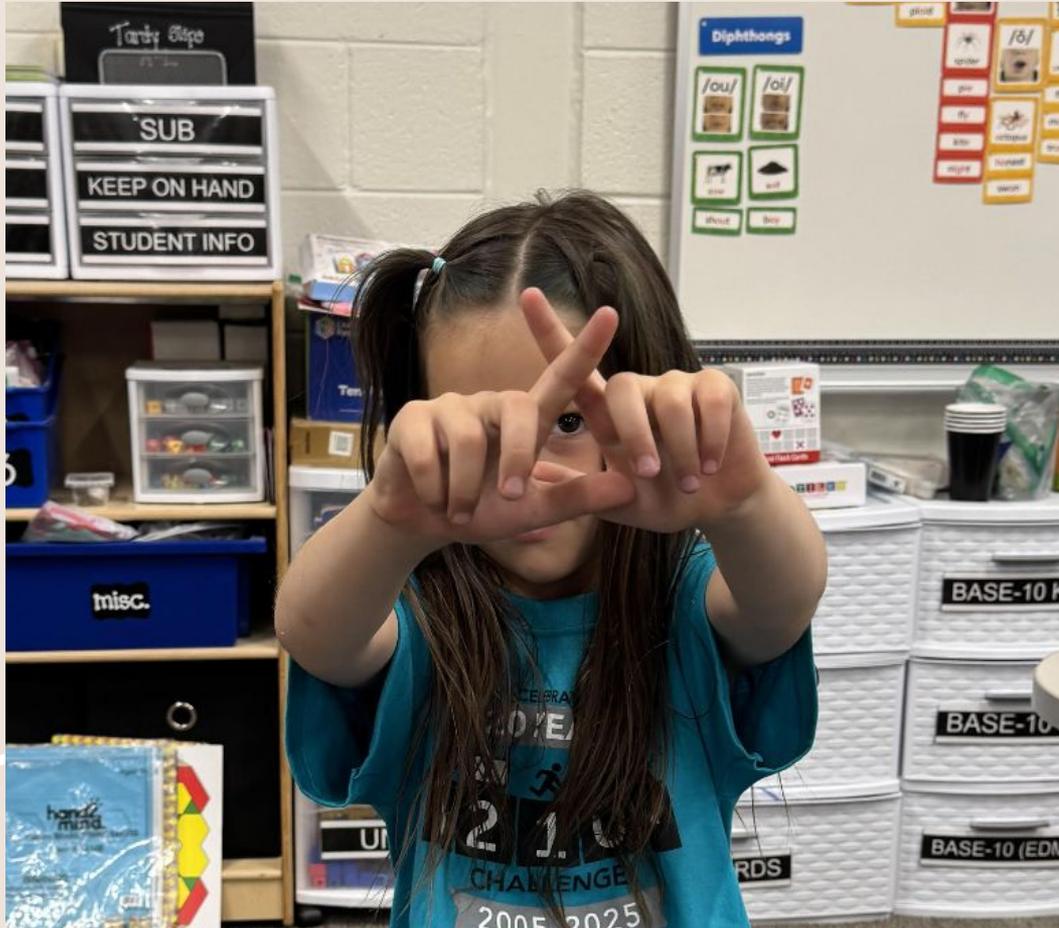
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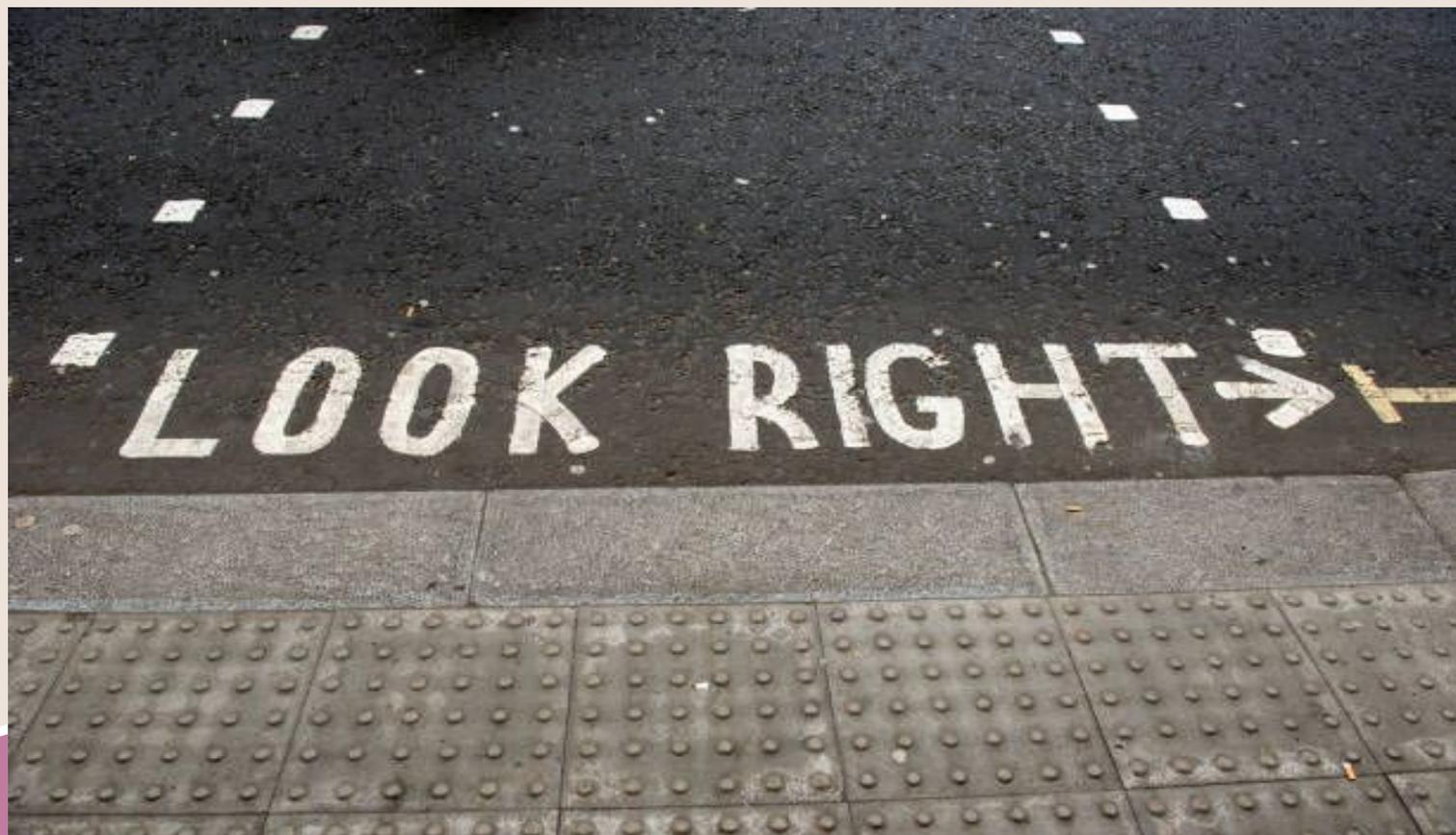
With both of your eyes open, center this triangle on an object in the distance.

Close your left eye.

If the object remains centered, then your right eye (the eye that remains open) is your dominant eye (or vice versa).







How then does eye dominance cause some children to struggle with deciphering words?



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A child with no dominant eye will not always recognize the direction that letters must be read, as the eyes move back and forth repeatedly, which is involuntarily.



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A child may be taught how to look to the left when reading, just as a baseball player can be taught to lift up the elbow when hitting, or to tighten up his or her stance. Just like any other muscle, the muscles in the eyes must be trained.

“Young children with a dominant left eye have shown superior performance to their right-eye-dominant peers when learning Hebrew, which is written and read from right to left.”

מימין

לשמאל



Preventing children from developing dyslexia: A premature writing hypothesis, D. Mather, University of Victoria, Perceptual and Motor Skills, August, 2024

“Initial orienting to the left could be a habit related to reading direction, with participants typically being left-to-right readers who might have learned to initiate inspection at the (top) left of a display. A number of studies have shown reduced or absent pseudoneglect in readers of Hebrew and other right-to-left languages.”



מימין

לשמאל

Influence of Reading Habits on Line Bisection. Cognitive Brain Research, Chokron & Imbert, 1993.

“When (those with dyslexia look) at something in front of them, such as a page in a book, their eyes perceive exact mirror images, which end up fighting for visual domination in the brain.”

## Left to right



“Scientists May Have Found the Real Cause of Dyslexia-And a Way to Treat It”, Donna Taylor, American Dyslexia Association, 2021.

“This could explain why it’s sometimes impossible for a dyslexic person to distinguish a ‘b’ from a ‘d’ or an ‘E’ from a ‘3’ .”

**Left to right**



“Scientists May Have Found the Real Cause of Dyslexia-And a Way to Treat It”, Donna Taylor, American Dyslexia Association, 2021.

Have you heard that most people can read words that are written incorrectly, as long as the first and the last letters are in the correct position?



“Effectively, our brains construct an incredibly complex jigsaw puzzle using any pieces it can get access to. These are provided by the context in which we see them, our memories and our other senses.” (Frasier Smith, commentary on a 1976 Nottingham University study, “What our eyes can’t see, the brain fills in”, University of Glasgow, 2011.)

How do you know what most people can see that are  
writing incorrectly, as long as the first and the last letters  
are in the correct position?



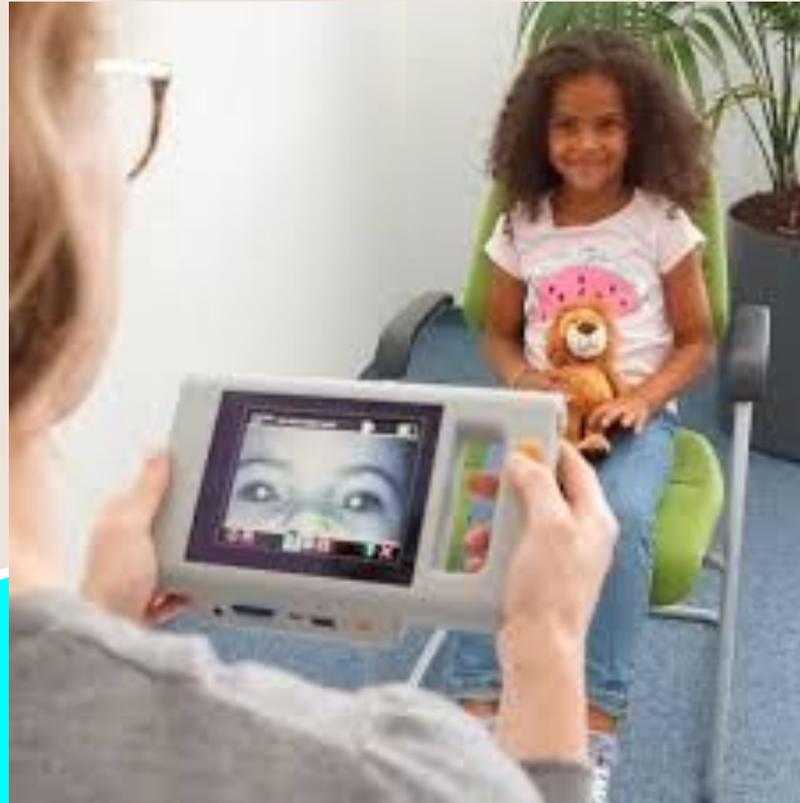
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The results show that our brains do not rely solely on what is shown to the eyes in order to 'see'. Instead the brain constructs a complex prediction.



“What our eyes can’t see, the brain fills in”, University of Glasgow, 2011.)

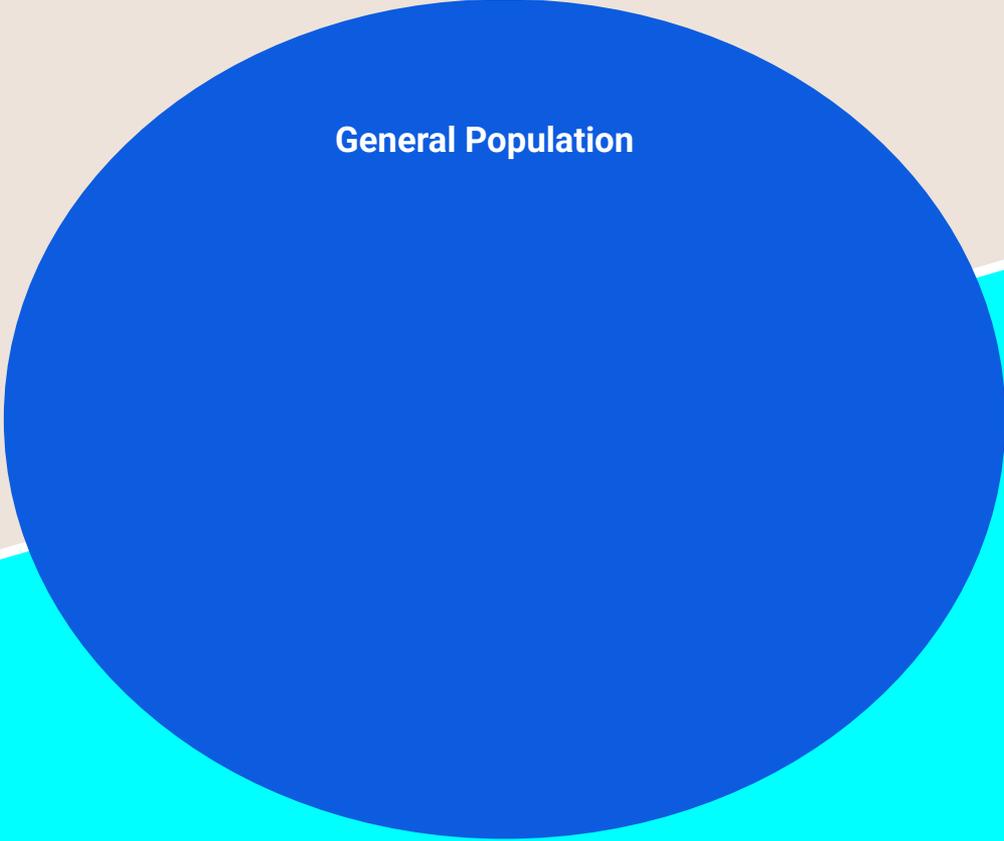
# Photoscreening Results



# Photoscreening Results

Solutions in Low Vision works with school district nurses in six states.

Vision screening results are from screenings of more than five thousand students.



**General Population**

# Photoscreening Results

Disparate Spherical Equivalent OD/OS

( $\Delta$  SE > +/- .25)

79.8%

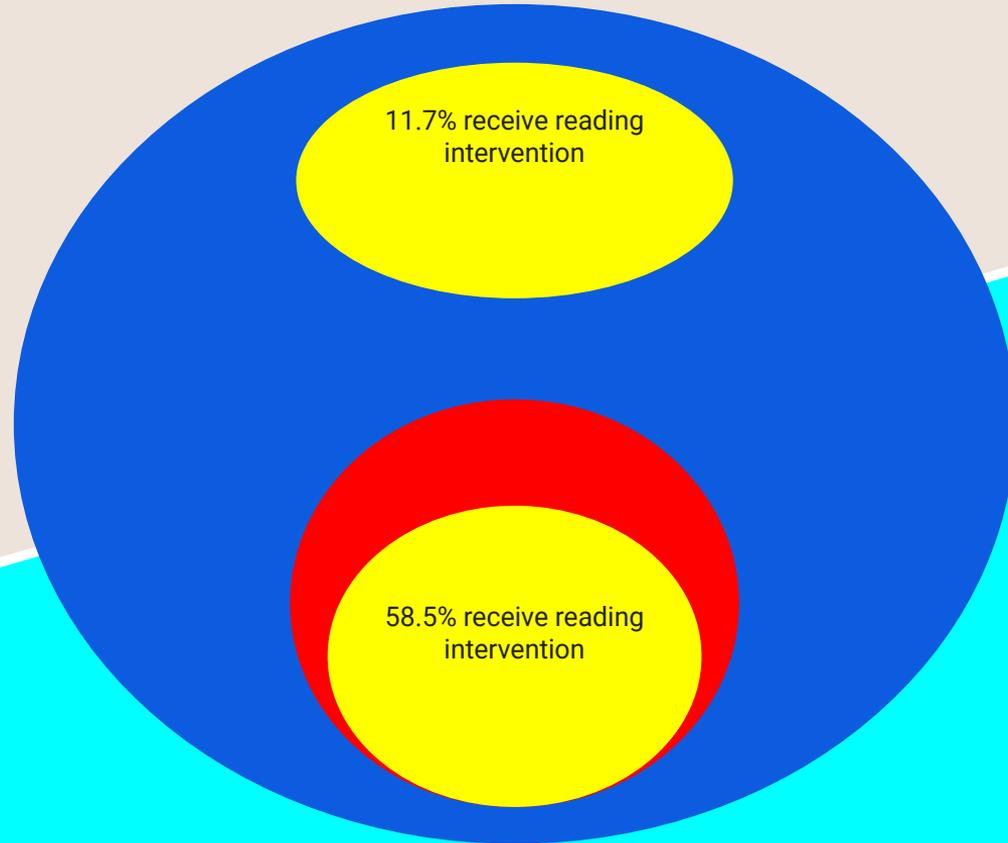
Even SE

(SE of 0 or +/- .25 in both eyes,  
with a  $\Delta$  SE of 0)

20.2%

# Photoscreening Results

Students with an even spherical equivalent are five times as likely to need reading intervention



# Lesson Format

# Symmetrical Letters, Upper Case

A

H

I

M

O

# Symmetrical Letters, Upper Case

T

U

V

W

X

Y

# Symmetrical Letters, Lower Case

i

l

o

v

w

x

# Level 1 Unit 1 Lesson 1

There are three levels, with four units each, six lessons per unit

# Level 1 Unit 1 Lesson 1

The slide colors change when transitioning to a new word.

# Level 1 Unit 1 Lesson 1

New words typically build on previous words.

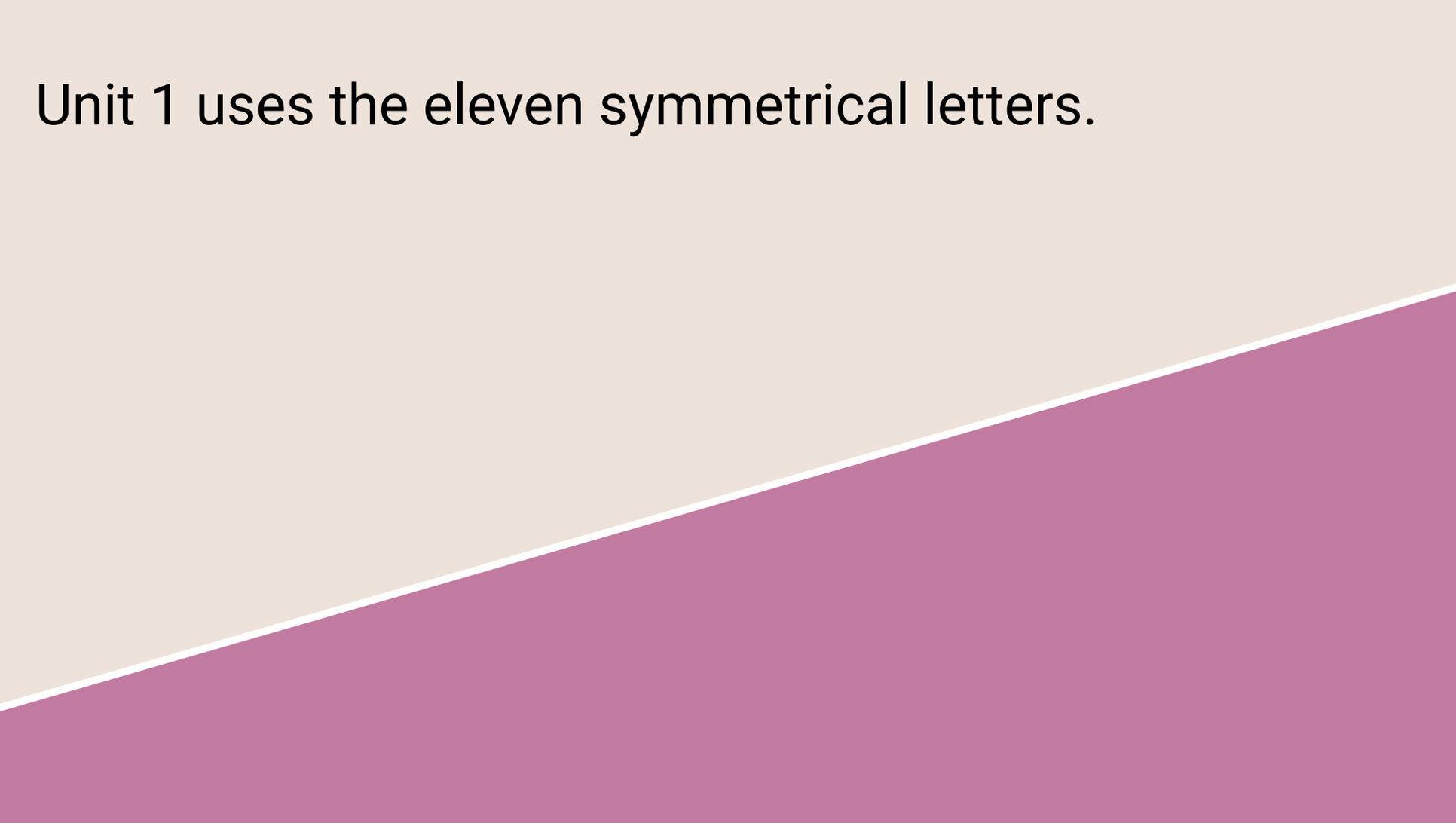
# Level 1 Unit 1 Lesson 1

The child does not have to read  
the word to benefit from the  
exercise.

# Level 1 Unit 1 Lesson 1

The child may instead read the letters, if necessary.

Unit 1 uses the eleven symmetrical letters.

The background of the slide is split diagonally from the bottom-left corner to the top-right corner. The upper-left portion is a light beige color, and the lower-right portion is a solid purple color. The text is positioned in the upper-left area, within the beige section.

A

A

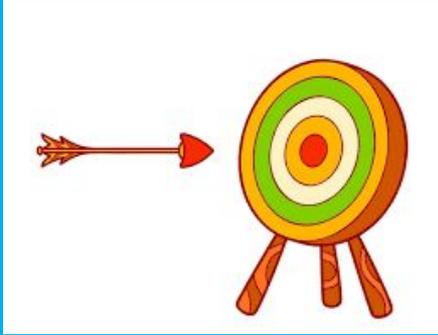
(Short A)

A  
M

(Short A)

A  
I  
M

(Long A)



**AIM**

**AIM**

A  
I  
M

(Long A)

A  
M  
Y

(Long A)



AMY

AMY

A  
M  
Y

(Long A)

M  
A  
Y

(Long A)



**MAY**



MAY

**MAY**

M  
A  
Y

(Long A)

M  
A  
T

(Short A)



MAT



MAT

**MAT**

M  
A  
T

(Short A)

H  
A  
T



HAT



HAT

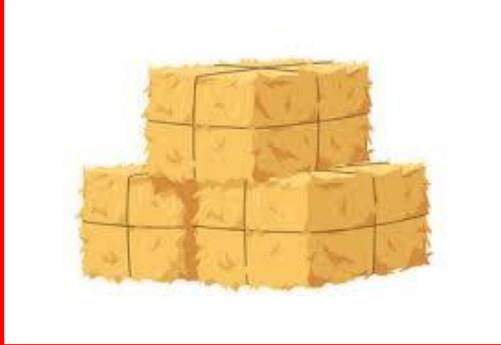


HAT

**HAT**

H  
A  
T

H  
A  
Y



**HAY**



HAY

HAY

H  
A  
Y

Unit 1 uses the eleven symmetrical letters.



Unit 2 introduces the fifteen asymmetrical letters.

C  
A  
T



CAT

CAT

C  
A  
T

A  
C  
T



**ACT**

**ACT**

A  
C  
T

Unit 1 uses the eleven symmetrical letters.



Unit 2 introduces the fifteen asymmetrical letters.



One asymmetrical letter per word is used to reduce confusion as fluency develops.

Unit 1 uses the eleven symmetrical letters.



Unit 2 introduces the fifteen asymmetrical letters.

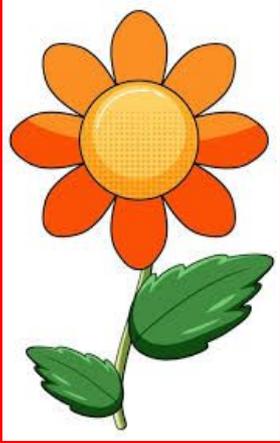


One asymmetrical letter per word is used to reduce confusion as fluency develops.



Later levels use two or more asymmetrical letters.

**B  
L  
O  
O  
M**



**BLOOM**

**BLOOM**

**B  
L  
O  
O  
M**

# Story Time: Khaki

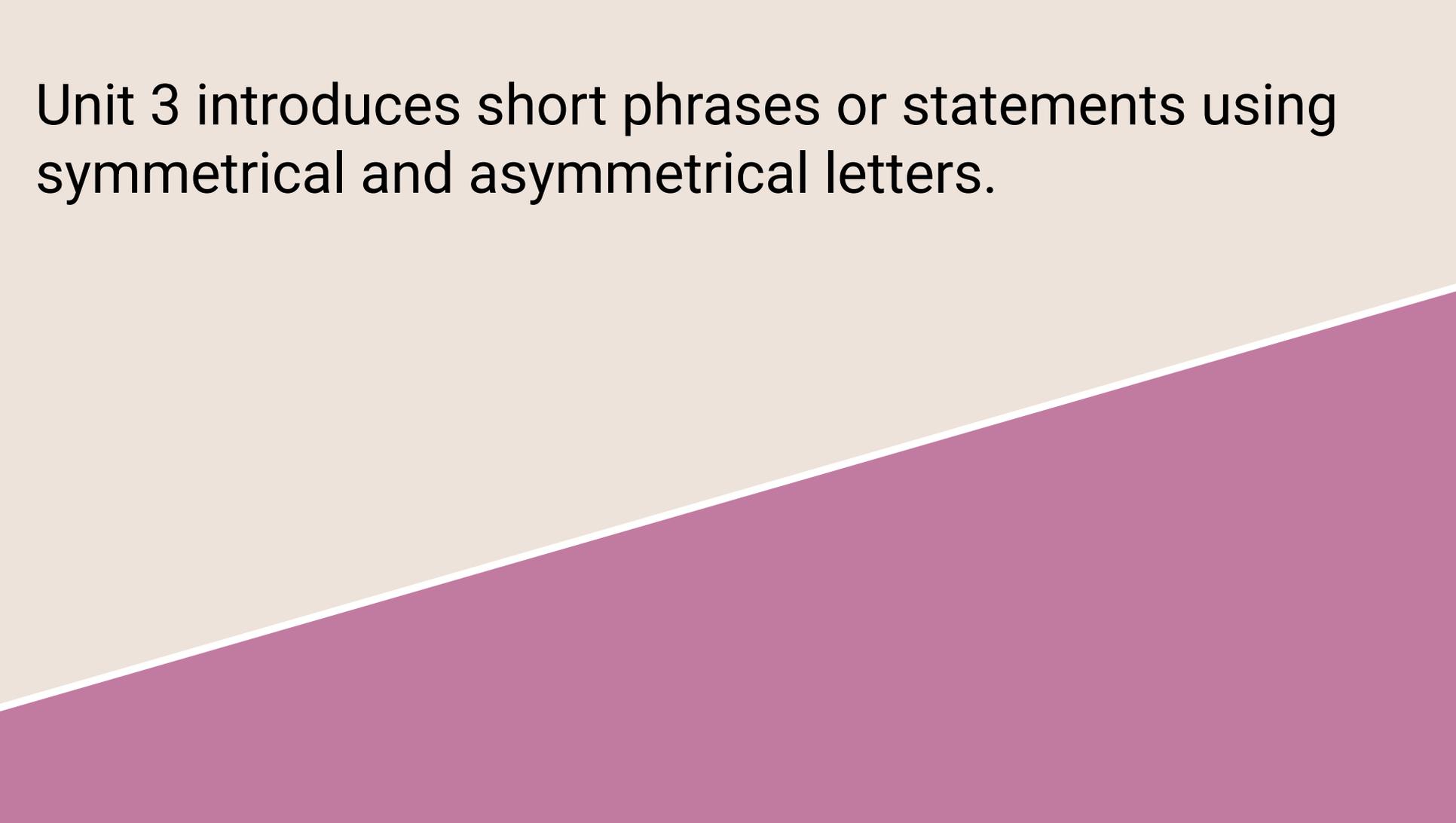
**K  
H  
A  
K  
I**



**KHAKI**

**KHAKI**

Unit 3 introduces short phrases or statements using symmetrical and asymmetrical letters.



A  
C  
T



**ACT**



**ACT OUT**



Unit 3 introduces short phrases or statements using symmetrical and asymmetrical letters.

The letters typically use the same, now more familiar, words used in Unit 1 and 2.

Story Time: JUMP FOR JOY

J  
O  
Y



JOY

JOY

J  
O  
Y

J  
U  
M  
P



JUMP FOR JOY

JUMP FOR JOY

**STORY TIME: I AM TOM**

I

A  
M

T  
O  
M



I AM TOM

**I AM TOM**

STORY TIME: SOCKET



SOCKET

SOCKET

Unit 4 introduces the lower case letters.

There are only six that are symmetrical, so twenty asymmetrical letters are used throughout the unit.

The first level concludes with  
Unit 4. There are 24  
lessons in total.

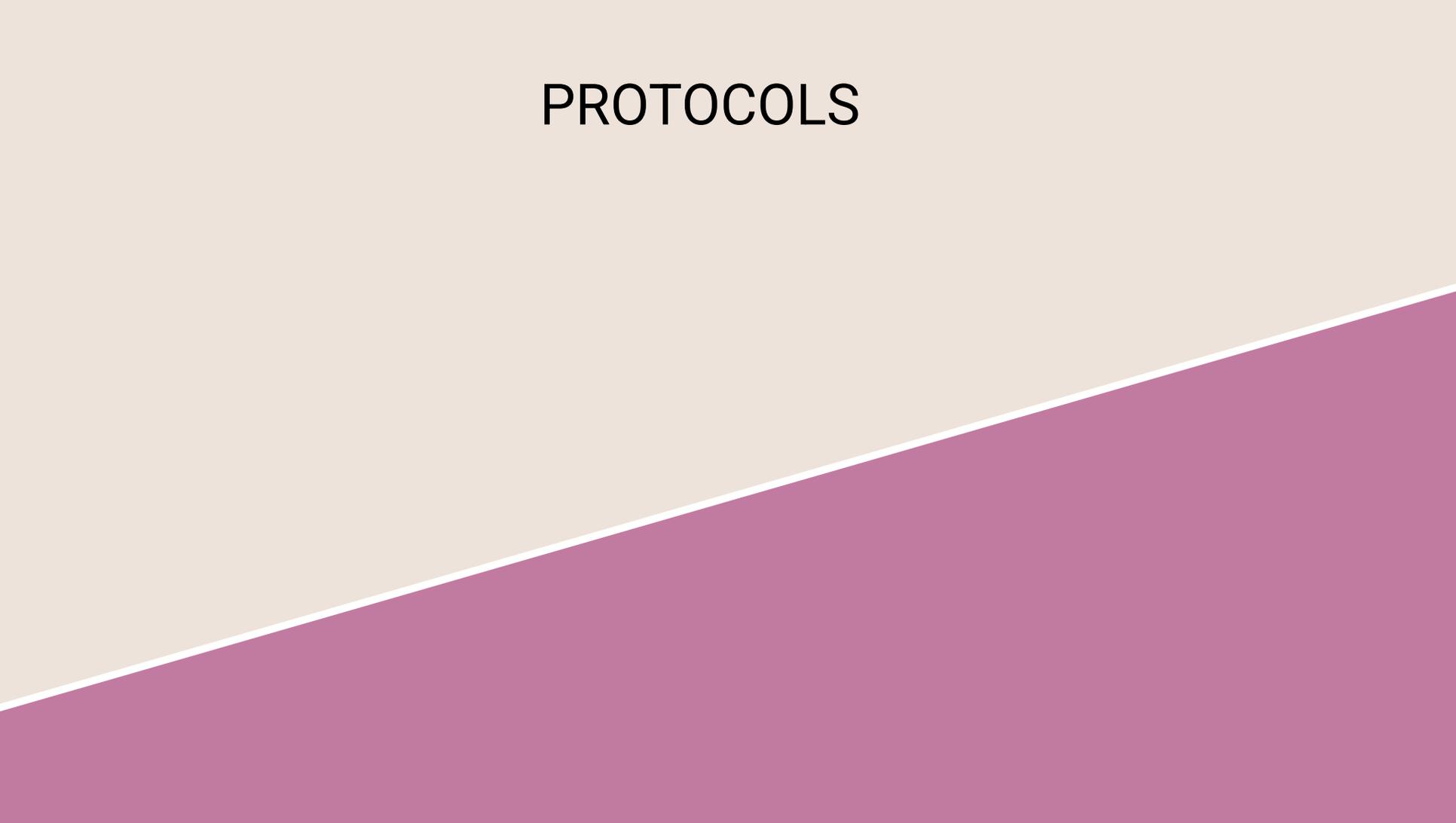
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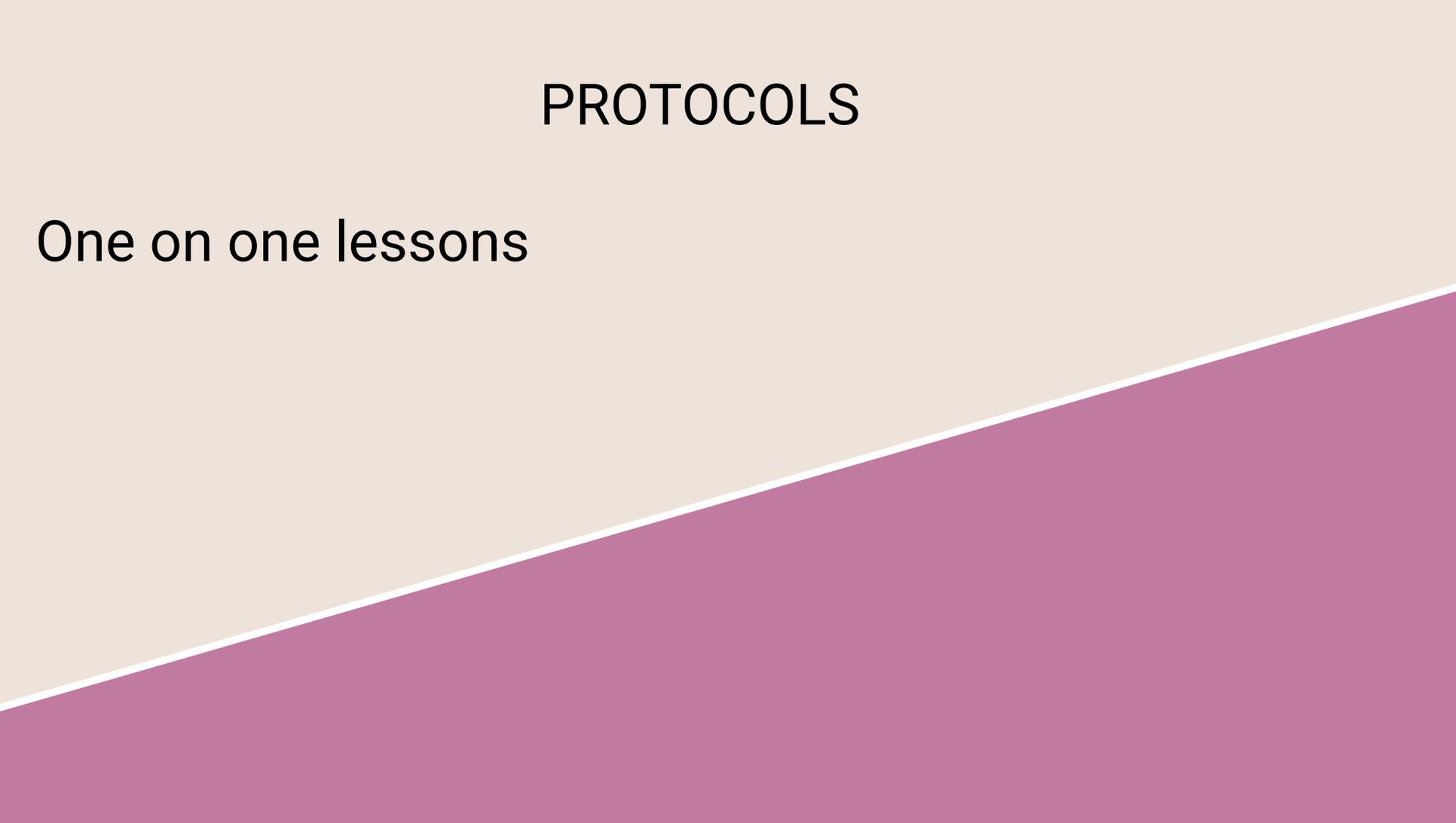
Lessons typically take about ten minutes, once students are familiar with the pattern.

# PROTOCOLS



# PROTOCOLS

One on one lessons



# PROTOCOLS

One on one lessons

## RATIONALE:

The adult needs to hear how the student pronounces the word

# PROTOCOLS

Document what the student says that differs from the text.

# PROTOCOLS

Document what the student says that differs from the text.

i.e., TOM, JOY, KHAKI, SOCKET

# PROTOCOLS

Pronunciation isn't critical.

# PROTOCOLS

Pronunciation isn't critical.

Do not correct how students say a word, but instead record how they see the word.

# COMMON QUESTIONS

Shouldn't the words be more challenging?

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The program is designed to help students “look left”. It is not about reading vocabulary.

# COMMON QUESTIONS

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The program includes more complex words and phrases in the elementary and secondary levels.

# COMMON QUESTIONS

Shouldn't the words be more challenging?

The program includes more complex words and phrases in the elementary and secondary levels.

The most significant difference between levels is that pictures are more age appropriate.

# COMMON QUESTIONS

Does a teacher have to lead the lessons?

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Does a teacher have to lead the lessons?

Teachers, paraeducators and volunteers have successfully conducted the lessons.

# COMMON QUESTIONS

Does a teacher have to lead the lessons?

Teachers, paraeducators and volunteers have successfully conducted the lessons.

An adult has to lead the lessons, as students won't hear that they read a word incorrectly.

# Reading Intervention Results

One district reported an average of 79% improvement in reading fluency in eight weeks as measured by DIBELS scores.

Another district reported a 98% improvement in reading speed with an average of 99% in reading accuracy.

A middle school saw students improve by 11 points in one semester for MAPS testing. 4 points is the expectation for one semester.

Students improved 189 points in one semester in their iReady reading fluency scores. Expected growth in one semester is 50 points.

Another district reported a 30% increase in reading speed for students after one month.

(Results from 2024)

# Reading Intervention Results

35/41 students at an elementary school who were already receiving reading intervention had an even spherical equivalent within .25 of 0/0:

17 students had a spherical equivalent of 0/0. 82% of them improved to grade level after one semester.

18 students had a spherical equivalent within .25 (either + or -, right or left eye).  
80% of the left eye dominant students improved to grade level.  
37.5% of the right eye dominant students improved.

60% were either left eye dominant or had no dominant eye.

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Students with a spherical equivalent of 0/0 improve in their reading using the intervention whether they were right or left eye dominant.

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60% were either left eye dominant or had no dominant eye.

Twice as many students with a spherical equivalent within a quarter point of 0/0 improve in their reading using the intervention if they are left eye dominant.

# Reading Intervention Results

100% of students at an elementary school improved from red to green within one semester (two years' growth).

(Results from 2025)

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At another school every kindergarten student exceeded green level within one semester. First grade students who started at yellow level improved to within one point, on average, of the green level. Second grade students who started at red level improved to green.

(Results from 2025)

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Second grade students who started at red level improved to green.

A school compared scores for students who are receiving reading intervention to those who also received this additional intervention. DIBELS scores for students receiving reading intervention improved by 5 points. Students receiving the additional intervention improved by 25 points. 18 points at this grade level is expected for one full year's growth.

(Results from 2025)

# Thank You!!

Michael Wright

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# Thank You!!

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