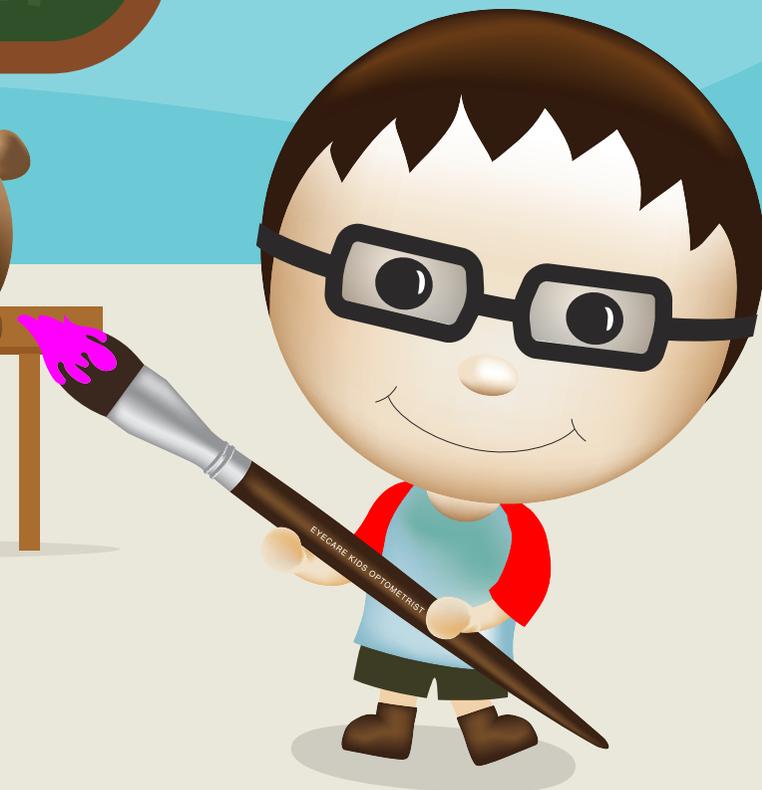


VISION AND LEARNING GUIDE

FOR PARENTS AND TEACHERS



Prepared by: **eyecarekids** Optometrists
vision & learning

Dear Parents and Teachers,

Did you know that 1 in 5 children has an undetected vision problem? Undetected because kids often don't tell grownups that they don't see well. Kids assume that everyone sees the same as they do.

Unfortunately, many childhood vision problems get past a school vision screen.

This is why it is critical for us to be able to know the warning signs of different childhood vision problems, which you will learn from this guide.

As behavioural optometrists, we care about children's visual performance at home and in the classroom. Not only does this involve clear vision, but also making sure the whole visual system is working efficiently and effortlessly, so that they can better concentrate on learning.

Since school is where a child spends most of their waking hours, we're also rallying all educators to help us catch vision problems amongst school-age kids. The earlier we detect them, the sooner we can do something about it.

As the grownups in their lives, we play a major role in ensuring that these kids we're entrusted to are able to reach their full potential and that nothing stands in the way of their learning.

If you suspect any vision-related problems in your kids or students, please send them to us for a thorough evaluation.

Thank you for helping us safeguard our children's vision.

Your partners in caring for kids' eyes,

Dr Soojin Nam

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Eye Sight

Seeing 20/20

Visual Perception

Ability to interpret, perceive and correctly identify visual information

Eye focusing

Ability to keep clear vision at all distances

Aspects of Vision



Eye tracking

Ability to fixate a target and follow it smoothly, quickly and precisely

Eye teaming

Ability of the eyes to work together and see a single image without excessive effort

Green circle equates to full visual field

Your Child's Vision

It is IMPORTANT to bring your child in for regular comprehensive eye examinations

- Basic school vision screenings, such as a reading letters off a chart, detect only 20-30% of vision problems
- 1 in 4 of ALL children have a vision problem significant enough to affect their performance in school
- There is evidence to suggest a relationship between eye teaming/tracking/focussing and reading problems

“80% of classroom learning is visually orientated”



What is developmental vision information processing?

- Good vision goes beyond seeing 20/20. A child with clarity of eyesight, and good functioning eyes can still have vision-related learning difficulties.

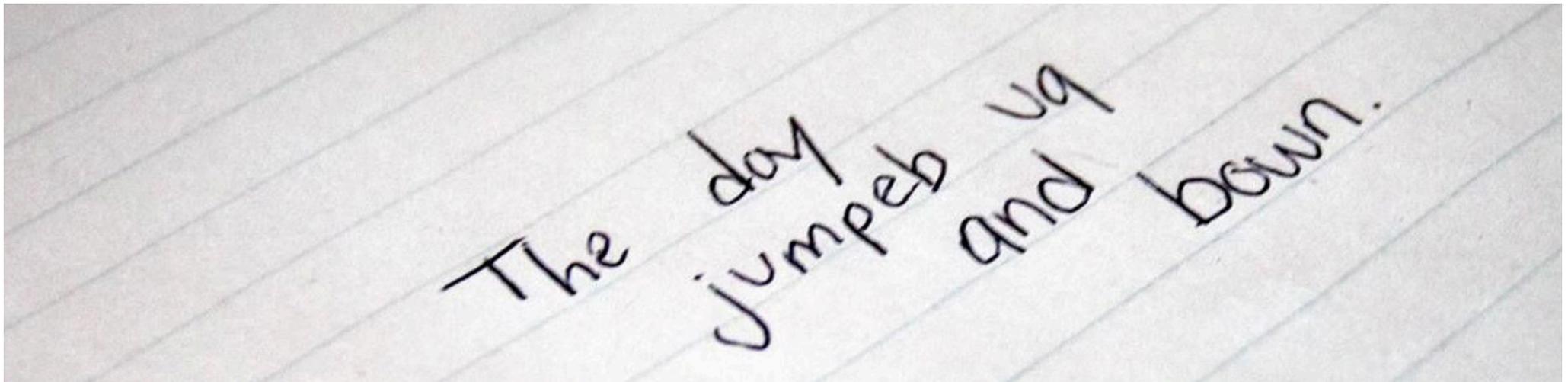


As your child grows, their visual perceptual processing skills develop gradually as well. A child must learn how to not only 'see' the world, but 'understand' the world that is around them by processing the information that is sent to the brain from the eyes so that they can learn effectively. They must accurately interpret what they are seeing. The skills required to do this include ocular motor skills, visual motor skills, visual analysis skills, visual spatial skills and visual auditory skills.

Signs & Symptoms

Delays in developmental vision information processing skills can lead to:

- Delays in school progress in areas such as reading, writing, spelling, maths
- Trouble learning left and right
- Reverses in letters and numbers
- Poor reading ability- misreads words, trouble learning sight words, poor comprehension
- Messy writing
- Troubles with spelling
- Slow at copying and completing worksheets and copying from the board
- Can respond orally but not in writing.
- Trouble learning basic maths concepts



Summary of Developmental Vision Information Processing Skills

Visual Spatial Awareness

This skill requires the child to differentiate their own right and left side of the body, as well as someone else's right and left. This skill is also essential in acknowledging, understanding and interpreting the space around oneself for example, directionality. Confusion in right/left can lead to letter, number and word reversals.

Visual Analysis

This includes the ability to differentiate between small differences in letters, numbers and words such as “b” and “p” or “went” and “want”. Visual analysis also includes a number of subset skills. One of these skills is visual closure which is the ability to see and understand meaning from the words, visualise a story, and be able to see the ‘bigger picture’ without getting lost in the details. Difficulties will show up in spelling, comprehension and in expressing ideas.



Visual Memory

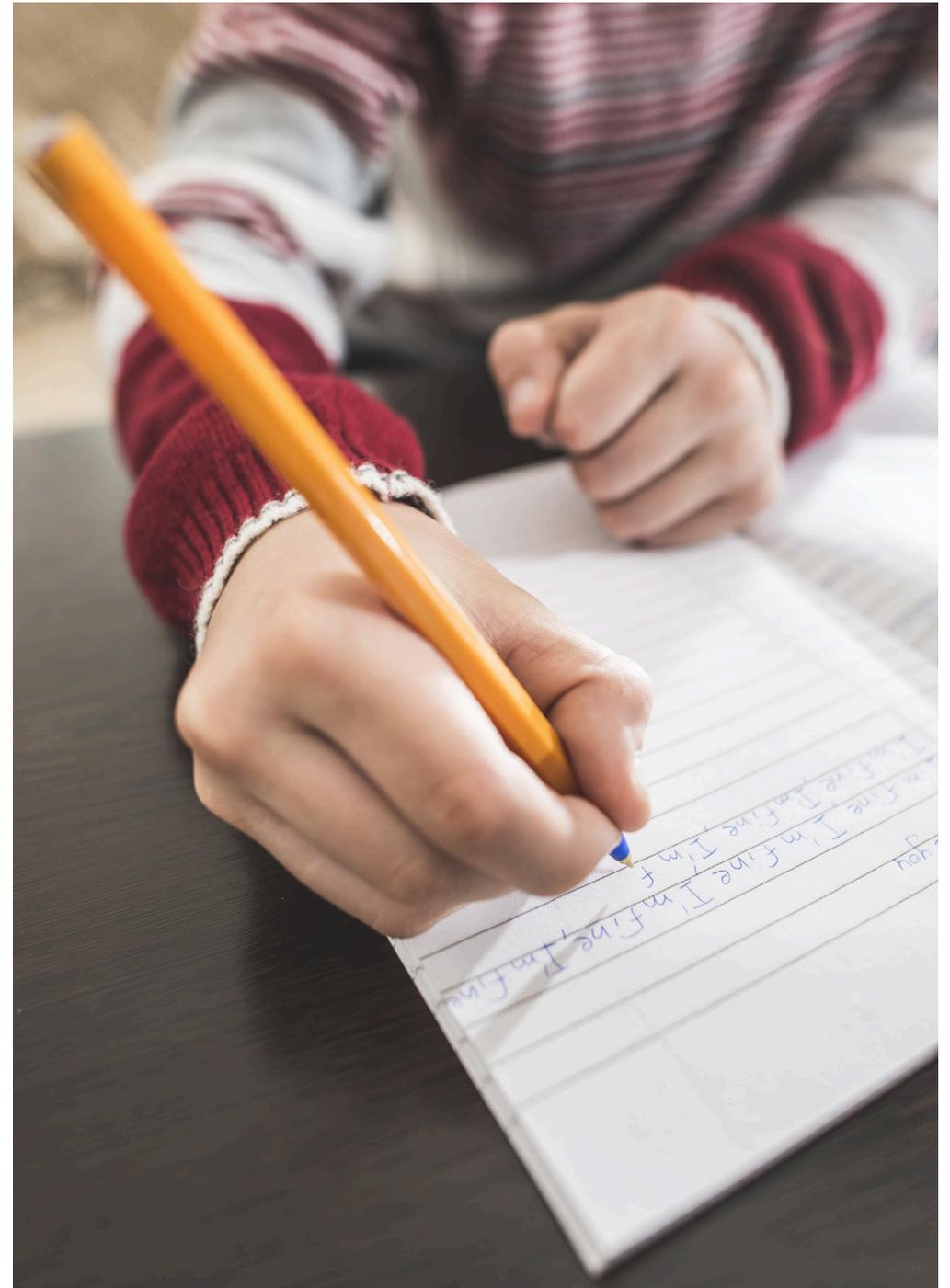
Good visual memory allows the child to immediately recognize words, shapes and numbers. When visual memory is not efficient, children will struggle to remember what a word looks like even when it has been repeated many times. Visual memory is strongly connected to working memory capacity.

Visual Motor Integration

Visual motor integration can also be known as eye-hand (fine motor) and eye-body (gross motor) coordination. Children with poor visual motor integration will tend to have slow or messy handwriting and may struggle with sporting activities.

Visual Auditory Integration

Poor visual auditory integration will show up as a difficulty in matching sounds/words with a visual presentation such as reading out loud.



What is Developmental Vision Therapy?

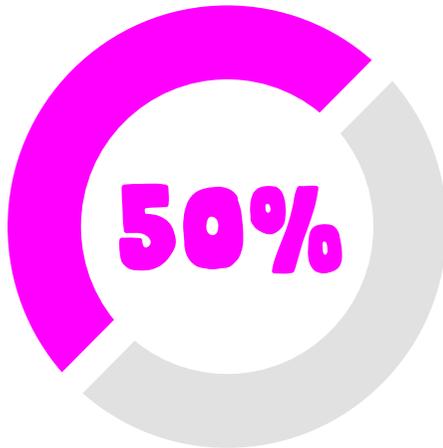
As the majority of classroom learning is visually orientated, developmental vision skills is vital for the child to be able to learn well. These skills help children to be able to interpret and accurately process in their brain what their eyes are seeing and can be learned and practiced.

Developmental vision therapy uses a tailored program and one on one in clinic consultations to train children to improve their cognitive visual abilities to their age appropriate level. This helps them to improve their ability to interpret and organise the visual information they see.

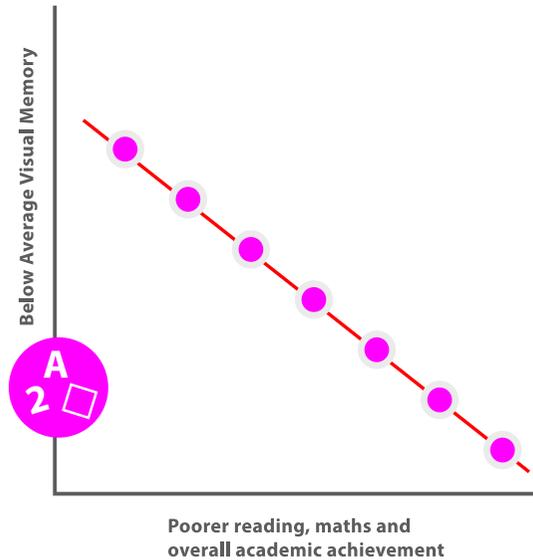


What is the scientific research supporting vision therapy?

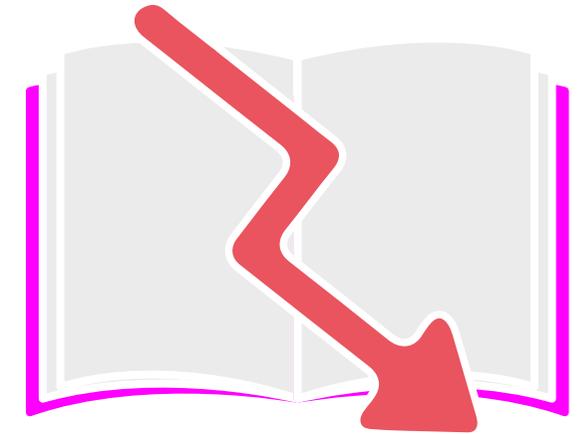
There is a link between under-developed vision information processing skills and learning .



Out of 87 children with severe language and reading problems, 50% was found to have visual and visual-perceptual problems



Research of children from second to fourth grade showed a strong correlation of below average visual memory to poorer reading, maths and overall academic achievement.



In another study with children from 7-9 years, poor visual motor integration is significantly related to worse academic performance.

Studies have demonstrated improvement in children with learning difficulties with developmental vision therapy.

- A group for 40 poor achieving student was given vision therapy. Compared to a group without vision therapy, there was a significant improvement in areas such as reading comprehension, speech patterns and school performance.

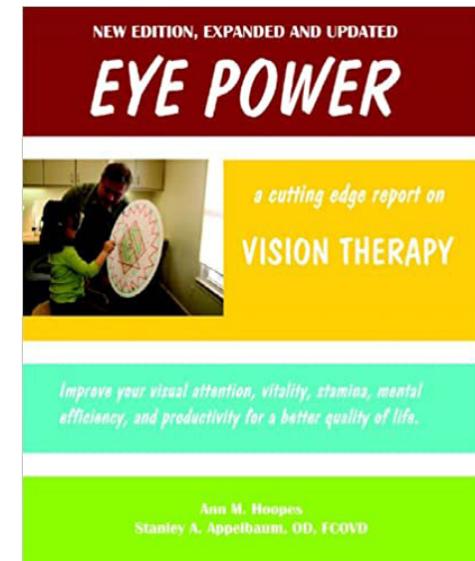
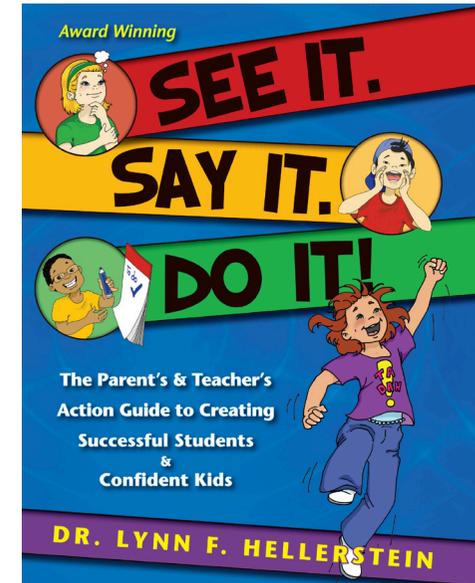
Further Resources on Perceptual Vision Therapy

For further information about developmental vision therapy and why it is relevant for learning in the classroom – we have extensive information available on our website www.eyecarekids.com.au

There are 2 books which we recommend for parents who are interested in learning more about activities which can help their children. They include:

- See it, Say it, Do it by Dr Lynn F. Hellerstein (Optometrist)
- Eye Power – A Cutting Edge Report on Vision Therapy by Ann Hoopes and Dr Stanley A. Appelbaum

These books will give you an excellent starting point and guide you with activities to do with your children. To catch up at school, they need someone to spend time with them consistently to help them 'learn how to learn'. There is also an excellent educational DVD by Robyn Cox called 'Get Ready for School' which explains why children sometimes have learning difficulties at school. You are welcome watch this 30 min DVD at our practice anytime you like free of charge.



What are Visual Skills?

Our eyes need to work together as a team efficiently and effectively to provide optimal conditions for learning through vision. However in some cases, the ability of both eyes to work appropriately together fails, and this manifests as a visual skill problem that can have drastic impacts on a child's learning even if their eyesight was "20/20".

These visual skills are usually divided into three categories:

- Eye teaming
- Eye tracking
- Eye Focussing



Signs and Symptoms of Visual Skills Dysfunction

- Complains of eyestrain and/or headaches
- Double vision and/or blurry vision when reading
- Covers or closes one eye when reading
- Short attention span and difficulty concentration when reading
- Words moving on the page
- Skipping words/lines when reading
- Loss of place on page or when copying from the board



Eye Teaming

What is Eye Teaming?

We are born with eyes looking straight ahead and although each eye works separately, they are designed to work as a team. The brain controls the eyes to work together to “fuse” the image from the right eye and the image from the left eye in order to sustain clear, comfortable single vision.

When Eye Teaming fails?

If the eyes cannot coordinate well together, eyesight may sometimes be blurry or double at other times. Efforts to prevent blurred or double vision can cause fatigue, eyestrain, headaches as well as loss of attention and comprehension during reading or near work. Children with this problem in particular can be easily distracted and can find it difficult to concentrate and remain on task.

DOUBLE
VISION

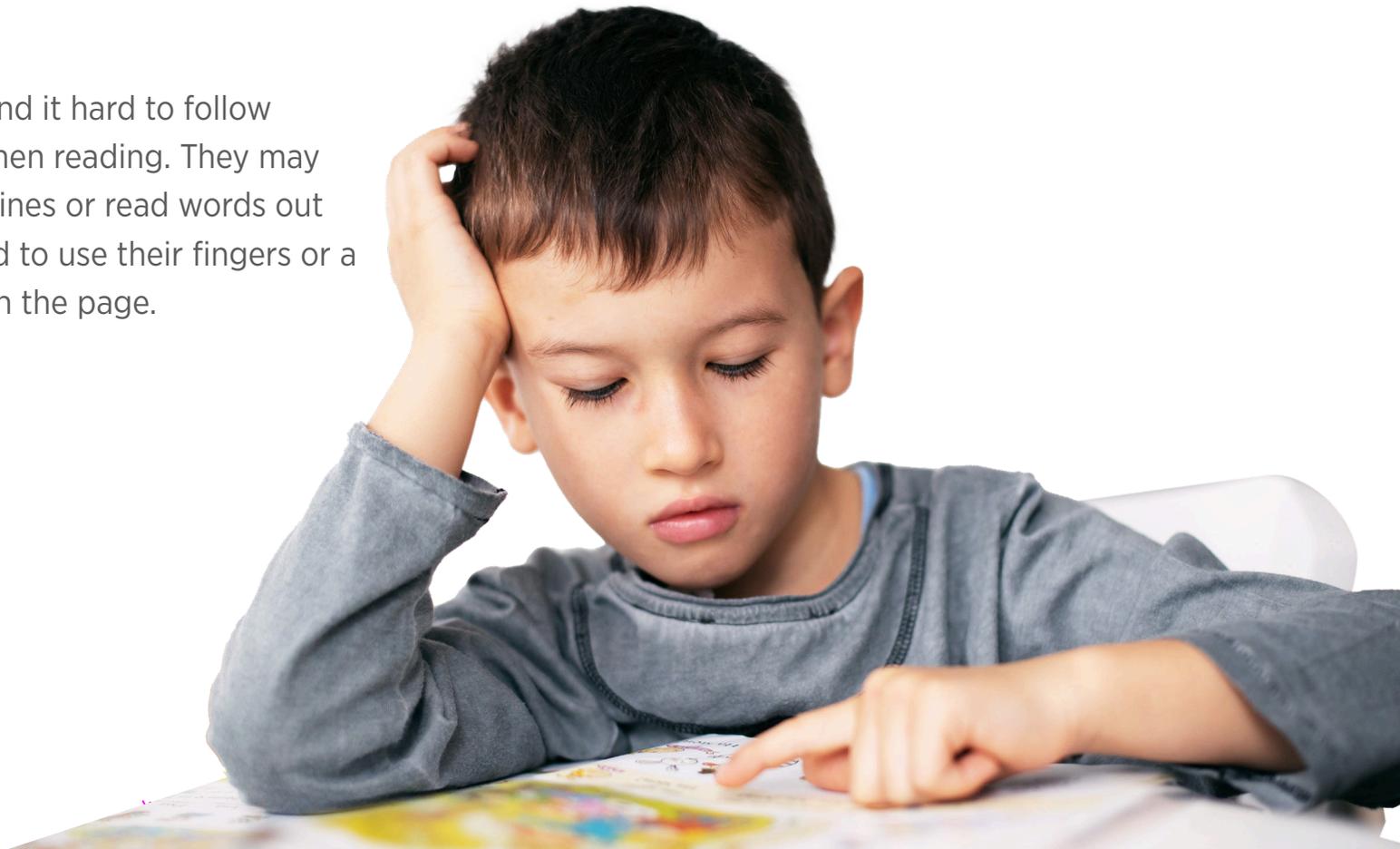
Eye Tracking

What is Eye Tracking?

Eye tracking is the ability to keep the eyes on target when looking from one object to another such as moving the eyes along a printed page, or following a moving object like a thrown ball. Reading requires very fine eye movements to be made. As well as fixating and following along a line of text, children must also be able to make the fine adjustment needed to read to the end of one line, then accurately find the next line down to continue reading.

When Eye Tracking fails?

Children with tracking difficulty will find it hard to follow letters and words across that page when reading. They may lose their place, skip words or whole lines or read words out of order. Some children may be forced to use their fingers or a ruler to help them follow the words on the page.



Eye Focusing

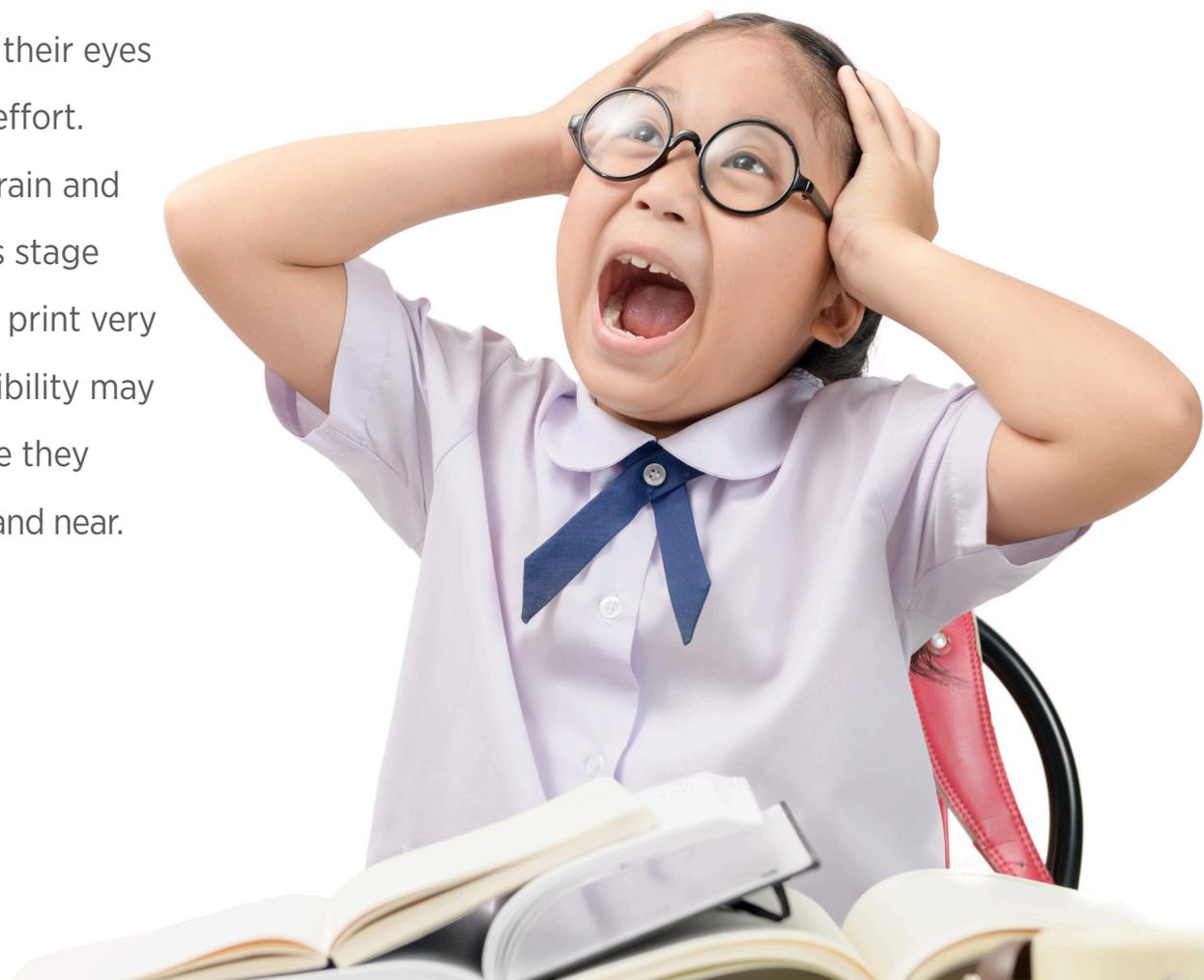
What is Eye Focusing?

Eye focusing, allows us to see clearly at different distances. Our eyes must exert and sustain focusing when we are looking close e.g. reading and relax when we are looking into the distance e.g. looking at the board.

When Eye Focusing fails?

Sometimes children with focusing problems will find their eyes fatigue very quickly and can no longer maintain the effort.

This can cause watery eyes, excessive blinking, eyestrain and headaches. Some children may avoid reading by this stage whilst others will continue to try 'hard' and may hold print very close when reading. Children with poor focusing flexibility may find it difficult to copy things from the board because they must continually change their focus between distance and near.



Vision and Learning Overview

Good vision requires your eyesight, visual pathways, and brain to all work together. When they don't, even a person with 20/20 eyesight can experience difficulty reading, writing and processing information, as 80% of all information comes to a child through their vision.

Most people think that if a person's visual acuity is 20/20 their vision is 'normal' or 'perfect'. That's not the case.

Visual acuity is a measure of the clarity of a person's vision and is tested by having a patient read a line of letters on an eye chart. This test does not require the same amount and types of eye movements that reading does, so it cannot be used to determine whether a child has the visual skills necessary to read.

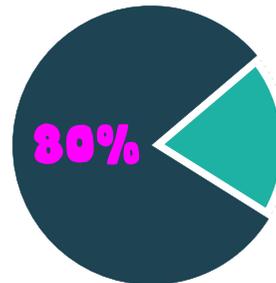


While clear vision is important, it is only one of many visual skills required to be able to read and learn.

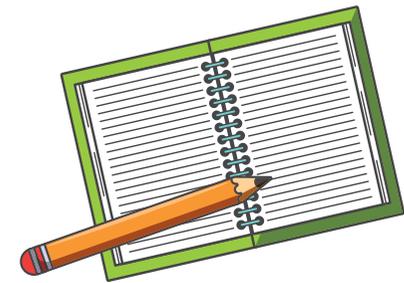
- 75-90% of classroom learning comes through the visual system.
- 80% of children who are reading disabled, including dyslexics, have vision problems that can be solved.
- 25% of ALL children have a vision problem significant enough to affect their performance in school.
- 95% of first grade nonreaders had significant vision problems. They had nearly 2.5 times more visual problems than first grade high achievers.
- In one study, 70% of juvenile delinquents had a vision problem.
- In one California funded study, recidivism (repeat offenders) reduced from 45% to 16% when wards received on-site optometric vision therapy.
- When a group of illiterate adults were vision screened, there was a 74% failure rate.
- School vision screenings, such as a Snellen eyechart, detect only 20-30% of vision problems in schools.
- Only 13 percent of mothers with children younger than 2 years of age have taken their baby for a functional well-care eye exam. Yet 1 out 10 children are at risk for having an undiagnosed vision problem.



75-90% of classroom learning comes through the visual system.



80% of children who are reading disabled, including dyslexics, have vision problems that can be solved.



25% of ALL children have a vision problem significant enough to affect their performance in school.

Source: *Visionandlearning.org*

What are some of the skills that affect learning?

Cedric ran to help Max.

Convergence

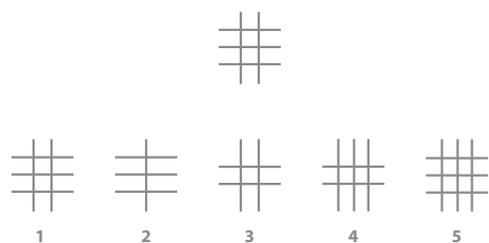
When reading, the eyes should aim inward at the same spot in order to fixate on print. If the eyes aim at a spot in front of or behind the print, extra energy and effort is required to maintain fixation and double or overlapping vision may occur. An example is shown to the left.

b d p q

Directionality

Directionality is important in understanding how similar shapes can have different meanings when they are in different orientations. To the left is an example of some letters that are commonly reversed by children with poor directionality. The letters are the exact same shape, but are called a different name depending on their orientation.

This can be a difficult concept because if another object, such as a chair, is turned on its side or upside-down it is still called a chair.



Form Perception

To the left is an example of an item from a visual perceptual skills test. In this particular test the child is asked to identify which form among the choices at the bottom matches the form on top. Other visual perceptual skills tests assess the child's ability to identify a form from memory, identify which form is oriented in a different direction, identify a form that has a different size or orientation, identify a sequence of forms from memory, identify a figure hidden in ground and identify an incomplete form as if it were complete.

On ce up on a ti
me t he re w as
a bo y na me d
Ja ck. He li ve d

On ce up on a ti
me t he re w as
a bo y na me d
Ja ck. He li ve d

Once upon a time
there was a boy
named Jack. He
lived in a shack
at the edge of a

Span of Recognition

Children who can read at accelerated speeds often have a good span of recognition, allowing them to recognize and process several words at one time. Children lacking this skill may only be able to see one word or letter at a time. In order to see what this would be like, try reading a sentence or paragraph while looking through a straw.

Visualization

Visualization is the ability to create mental images. Children who have vision problems may also have difficulty with visualization. This skill is important for success in many school subjects including spelling and math.

Tracking (Pursuits and Saccades)t

Commonly referred to as ‘tracking’, maintaining fixation on a moving target (pursuits) or accurately switching fixation between two targets (saccades) are two types of eye movements that are essential for reading and learning.

An example of this is when your eyes reach the end of a line of print and have to accurately move from the end of that line to the beginning of the next line of print. Difficulty with these eye movements can cause a child to skip words or lose their place easily when reading.

Impact on Subjects

Considering 80% of the information you process comes through your visual system, it's not surprising that a vision problem can affect a number of different subjects. Here's a brief overview of how vision problems can manifest in various areas.

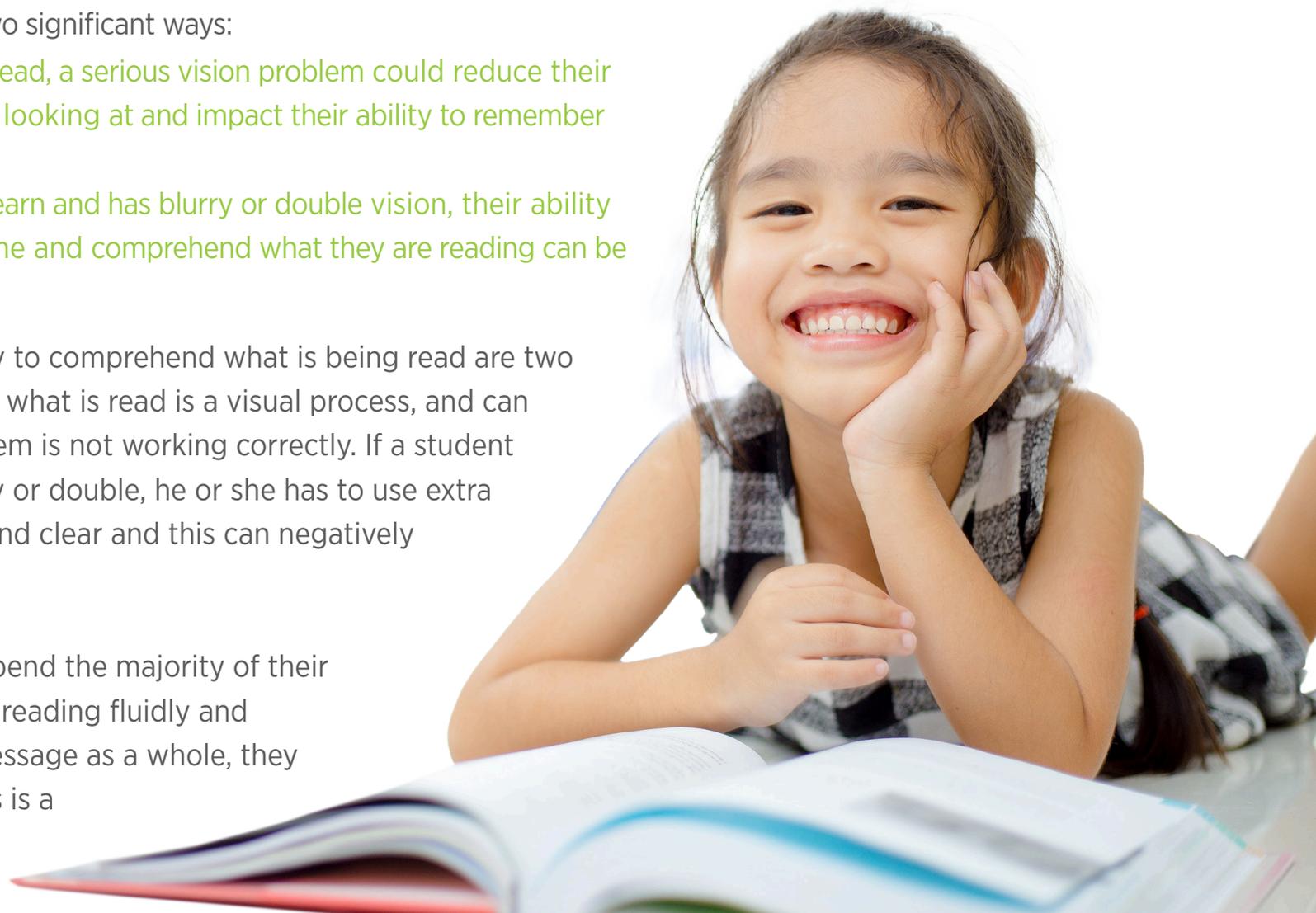
Reading

Vision problems affect reading in two significant ways:

- When a student is learning to read, a serious vision problem could reduce their ability to know what they are looking at and impact their ability to remember numbers and letters.
- When a student is reading to learn and has blurry or double vision, their ability to read for long periods of time and comprehend what they are reading can be severely reduced.

The ability to read and the ability to comprehend what is being read are two different things. Comprehending what is read is a visual process, and can be affected when the visual system is not working correctly. If a student sees words on the page as blurry or double, he or she has to use extra effort to keep the words single and clear and this can negatively impact comprehension.

Students with vision problems spend the majority of their time decoding words. Instead of reading fluidly and visualizing the words and the message as a whole, they focus on each specific word. This is a



struggle, making it difficult to quickly process sections of text. As a result, students will track text with their fingers. They'll read a slower pace and will have fluency issues. Their reading will be marred by repetitions, insertions, omissions and substitutions.

These reading problems are all too often misconstrued as laziness on the part of the student. They are not. They are simply symptomatic of a vision problem. When corrected, it's common for students to enjoy reading and no longer avoid it.

Math

If a student has difficulty seeing things as clear and single, they may have trouble seeing decimals and/or signs. An important skill in math is to organize what is being written and the student may have trouble lining things up and keeping their place if their visual skills are poor.

Laterality and directionality are also important concepts in math. If a student sees the orientation of numbers incorrectly, they will have difficulty completing the problem.

Students who lack visualization skills can often be found counting on their fingers or verbalizing sequences. Given enough time, they can generally compute an answer, but they tend to do poorly on timed tests.

Awareness of numbers and what they mean as well as being able to visualize numbers and quantities, are critical to success in math and can be impacted if a child has a vision problem.

It should be noted that a child with vision problems may do well in math but be a poor reader, primarily because math doesn't require as many precise eye movements as reading.



Spelling

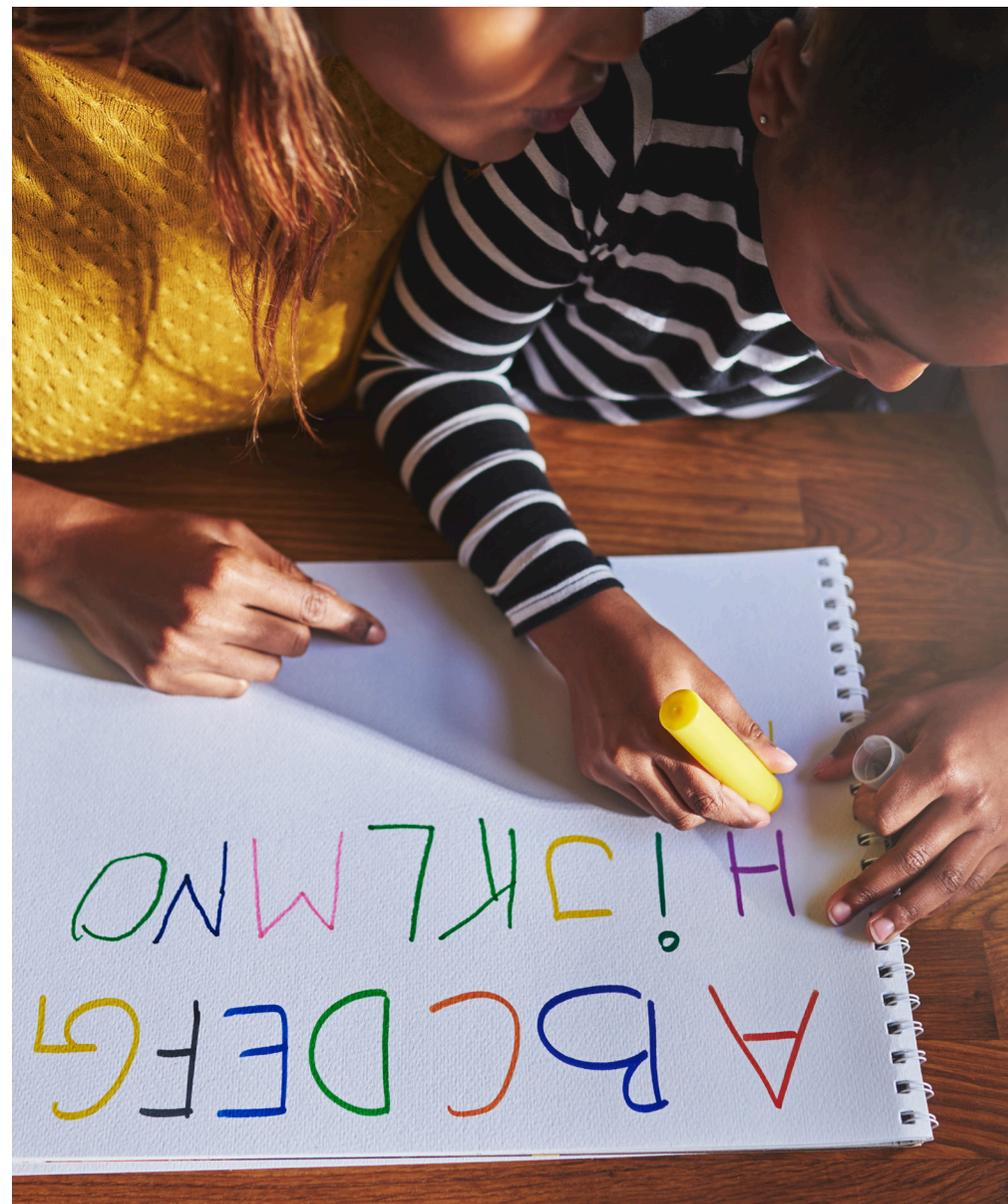
Visual recall, the ability to create a visual image based on past visual experience without currently having that experience, is a visualization skill that is critical for spelling. In spelling, it is the ability to create a mental image of a word without being able to look at the word.

Writing

Writing involves both handwriting and composition skills. It is necessary for vision to lead the hand for handwriting and this can be very difficult if the student cannot see well. In fact, often you can see in the handwriting where the student stopped looking or became fatigued.

Difficulty writing straight on a page is often a result of poor peripheral awareness.

There are several vision-related skills that are critical to good handwriting that may be underdeveloped in a student with vision problems. Visualization is also important in handwriting because the student needs to remember what different words look like in order to reproduce them on the page. Spatial concepts are important in handwriting to know and plan how words will go together. Good laterality and directionality are important to differentiate similarly shaped letters in different orientations (e.g. b, d, p, q).



Visualization is also critical for writing composition because the student needs to be able to organize and re-organize the composition in his or her head.

What does the work of someone with vision problems look like?

Take a look at some of the samples of students with vision problems:

Unequal sized print

All aboard the train

Words moving or letters running together

All aboard the train.

Words take off and leave the page

All aboard the train.

Double print

All aboard the train.

Reversed letters

All aboard the train.

Words squished together

All aboard the train.

Words appear as blotches or streaks

All aboard the train.

Words are shaky

All aboard the train.

STRESS POINTS

These are areas that can cause stress for students with vision problems:

- Small print
- Sustained, near point work
- Full pages of print, with blocks of text close together
- Copying from chalkboard or SMART Board to paper on desk
- Fine-motor skills
- Flickering fluorescent bulbs
- Standardized test sheets
- Random lists of spelling words
- Timed tests
- Crossword puzzles
- Reading aloud to a group without being given a warning
- Being asked to instantly identify right and left directions



TAKE THE VISION QUIZ

This Vision Quiz is the first step towards assessing if your child has a vision problem. Write the number that best describes the frequency of each symptom:

0 = Never, 1 = Seldom, 2 = Occasionally, 3 = Frequently, 4 = Always

SYMPTOM	SCORE
Avoids near work or reading	
Skips or repeats line when reading	
Omits small words when reading	
Trouble keeping attention when reading	
Tilts head or closes one eye when reading	
Words run together when reading	
Holds reading material too close	
Poor reading comprehension	
Difficulty copying from the board	
Misaligns digits or columns of numbers	

SYMPTOM	SCORE
Reports headaches after near work	
Handwriting goes "uphill" or "downhill"	
Forgetful or has poor memory	
Loses or misplaces their things	
Clumsy, easily knocks things over	
Trouble completing assignments on time	
Poor time management	
Usually says "I can't" before trying	
Burning, itchy or watery eyes	
TOTAL POINTS	

If your score is 20 or more, this indicates that your child needs a functional vision exam.