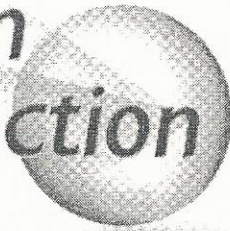


# The Vision Connection

Eye-Brain Skills for Learning



**CONNECTION TO LEARNING CHARTS**

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# 1. EYE-MOVEMENT CONTROL IN THE CLASSROOM

With good eye-movement control, we can keep our eyes still on a target, make accurate jumps from one target to the next, and follow a moving target.

WHAT WE SEE	WHAT WE MIGHT THINK	WHAT'S HAPPENING IF IT'S REALLY AN EYE-MOVEMENT CONTROL PROBLEM
Loses place when reading; skips words or lines when reading aloud	Not paying attention; rushing through text	The eyes may be jumping over words or even entire lines, taking the child to the wrong place in the text.
Uses finger to underscore words when reading	Unconfident reader	The child has discovered (unknowingly) an adaptation that guides eye movement. However, using the finger as a guide results in reading word by word, which is very slow. Fast readers use their eyes to take in several words and often an entire line at one time.
Reads slowly	Not bright; can't decode well	When a child's eyes jump around and skip over words, the text will often not make sense. Children with eye-movement problems have to reread the text to try to fill in the blanks, and when rereading may jump over different words.
Has poor reading comprehension	Not bright; not interested in the topic; has difficulty because the text is in the child's second language	When a child is skipping words or entire lines of text, overall reading comprehension will likely decrease.
Moves head back and forth while reading	Unconfident reader	This child has made an adaptation for poor eye-movement control: the head, instead of the eyes, does the moving. However, neck muscles are now strained, which puts stress on the visual system. Since head movement is not as efficient or precise as eye tracking, the child may still skip over words.
Avoids reading	Not "school-oriented"; personality preference	Avoidance of reading is another clever adaptation. Many adverse effects of poor eye-movement control are eliminated if the child is not reading.
Writes with inconsistent spacing between words; doesn't stay on the lines	Sloppy work	When children's eyes are making "jerky" jumps, their writing may reflect a similar type of movement.
Doesn't pay attention while the teacher is giving instruction at the front of the room	Goofing around; not interested in the topic	If a child's eyes cannot stay still on the teacher or follow as the teacher moves around the front of the room, then his or her eyes will go elsewhere.
Can't hit a baseball	Uncoordinated; not good at sports	If a child's eyes cannot track a moving target, then he or she will not be able to follow a pitched ball.

## 2. FOCUSING IN THE CLASSROOM

With good focusing skills, we can quickly and clearly shift focus from near and far distances.

### WHAT WE SEE

Takes longer than everyone else to copy off the board

Complains of being tired when copying from the board

Copies the first several lines of board work correctly, but then makes errors

Makes mistakes when copying from the board, even at the beginning of the task

Makes mistakes copying from reference books; does not copy corrections and editing in doing a final draft

### WHAT WE MIGHT THINK

Not paying attention; doesn't stay on task

Complainer; just doesn't want to do the work

Careless; not paying attention

Careless

Careless

### WHAT'S HAPPENING IF IT'S REALLY A FOCUS PROBLEM

The focusing shift from a distant point to a closer point and vice versa should happen within one second. However, the child with poor focus may take as long as 10 seconds. As a result, this child will be much slower at copying from the board.

The child with poor focus has to expend more energy to shift focus continually and soon fatigues from doing so.

At the outset, the child makes a painstaking effort to shift focus from far (the board) to near (the paper). With that extra effort, the child is able to copy accurately the first few lines. However, unable to sustain this level of focus for the entire task, the child then begins to make errors.

Some children with poor focusing have difficulty doing any copying at all. Distracted by the need to concentrate on regaining focus after each shift, and suffering from blurred vision until such focusing becomes clear, the child is likely to make mistakes in copying.

Same as above.

### 3. VISUAL DISCRIMINATION IN THE CLASSROOM

With good visual discrimination skills we see details, and we can quickly recognize both similarities and slight differences among objects, words, and forms.

#### WHAT WE SEE

Confuses similar letters

Does not correct misspelled words in written work

Spells words correctly in original writing and orally, but does poorly in spelling sections of standardized tests

Has poor reading comprehension

Cannot compare and contrast similar concepts in essay form (e.g., "Compare the Spanish and English explorers. How were they the same? How were they different?")

#### WHAT WE MIGHT THINK

Not bright; not paying attention

Rushes through work; just a "bad" speller

Rushed through the test; didn't "care" about test

Needs more decoding or vocabulary lessons; needs more reading comprehension lessons

Not bright; didn't study the literal information needed for such an analysis

#### WHAT'S HAPPENING IF IT'S REALLY A VISUAL DISCRIMINATION PROBLEM

If a child's eyes have not learned to distinguish differences among similar pictures, letters, or words, then minor variations will not stand out.

A child who cannot recognize differences between similar words may believe that everything is spelled correctly—even though the work still has errors.

Standardized tests often require that a child select the correctly spelled word from a choice of four similar words. So, even knowing how to spell a word correctly, the child with visual discrimination problems may not quickly recognize or ever note the correct spelling among a set of similar words.

If a child is mistaking similar words for those actually appearing in the text, then content of the material will be different for that reader. For example, a child might read "Where is the plant?" when the text says "Where is the plane?" Such changes, especially if they are numerous, will affect the child's overall comprehension of the material.

A child who cannot distinguish differences in simple vision tasks (such as the difference between **big** and **bag**) may lack the mental framework for making distinctions between two similar abstract concepts.

## 4. FORM PERCEPTION AND REPRODUCTION IN THE CLASSROOM

With good form-perception and reproduction skills, we see reference points that distinguish letters and forms from each other.

### WHAT WE SEE

Has difficulty recognizing shapes

Does not write letters correctly

Fails to recognize the same word in the next sentence or page

Has difficulty with higher-level thinking tasks

Cannot produce drawings (even with guided art lessons) that reflect the level of the rest of the class

### WHAT WE MIGHT THINK

Not very bright; not paying attention

Sloppy; rushes when writing

Needs to pay more attention; goofing around

Not very bright

Not skilled in art

### WHAT'S HAPPENING IF IT'S REALLY A FORM-PERCEPTION AND REPRODUCTION PROBLEM

The child with form-perception problems does not see a reference point when looking at shapes. Without this reference point, the child has nothing to call on to see the difference between, for example, an oval and a circle.

For a child who has difficulty perceiving and producing simple geometric forms, seeing and producing our twenty-six letters—with all their variations in lines, curves, and angles—is even more difficult.

A child who does not truly “see” the form the first time cannot be expected to recognize that form consistently whenever it appears.

The child with form-perception problems has difficulty seeing how the parts create a whole in basic vision tasks. For example, where there are two intersecting lines, the child may see instead two separate angles joined at the middle. If children are unable to see part-whole relationships in simple visual tasks, then they will not be able to analyze more abstract part-whole relationships (e.g., solving a math word problem) in the content curriculum.

The child with form-perception problems will not be able to produce what he or she cannot initially see.

## 5. VISUAL FIGURE-GROUND PERCEPTION IN THE CLASSROOM

With good visual figure-ground perception, we can see information in the foreground regardless of the presence of background stimuli.

### WHAT WE SEE

Can't find something in the desk (or takes too long to do so)

Doesn't complete math problems on a sheet (but knows the answers when asked orally)

Doesn't follow whatever the teacher is presenting on the board

Doesn't know what the homework assignment is or forgets to bring in the homework (even when completed)

Easily distracted; unable to maintain focus during direct instruction

Can't locate information in a book

Has poor reading comprehension

### WHAT WE MIGHT THINK

Disorganized; playing around

Doesn't like math; isn't paying attention when doing seatwork; is wasting time

Needs to pay more attention during class

Disorganized; irresponsible; doesn't care about schoolwork

Attention deficit problems; immature

Needs to learn better research skills

Needs more practice reading text and answering questions

### WHAT'S HAPPENING IF IT'S REALLY A VISUAL FIGURE-GROUND PERCEPTION PROBLEM

A child with poor visual figure-ground perception will have difficulty spotting what is important among a group of many items.

A child with poor visual figure-ground perception may become easily distracted when there are numerous problems on a page.

Surrounding stimuli (usually on or around the board) will make it difficult for a child with poor visual figure-ground perception to concentrate on the one spot where the teacher has recorded key information.

When the assignment is written on the board amid other writing and displays on a nearby wall, children with visual figure-ground problems will find it difficult to concentrate on getting it copied down. If the assignment is on a sheet that has been placed inside desks or student mailboxes, children may have difficulty locating it quickly when the bell rings. At home, these children may not "see" the homework among the many items in their rooms, and will therefore be less likely to get the work into their backpacks.

The inability to distinguish what is important from what is not makes it difficult for children with visual figure-ground problems to focus on whatever is being discussed, read, or demonstrated.

A child with poor visual figure-ground perception will have trouble "zeroing in" on information in reference books.

A child with poor visual figure-ground perception may not be able to distinguish the main idea from the supporting details in a reading passage, and thus may have trouble answering comprehension questions that call on higher-level thinking skills.

## 6. VISUAL IMAGERY IN THE CLASSROOM

With good visual imagery skills, we can see clear images in our mind's eye.

### WHAT WE SEE

Misspells even basic words

Can't remember math computation number facts

Studies longer than most and still doesn't do well on the social studies or science test

Has difficulty answering comprehension questions that require critical thinking

Cannot follow multistep directions

Cannot find things in desk or binder

### WHAT WE MIGHT THINK

Not bright; careless; hasn't been studying

Not bright; careless; hasn't been studying

Not bright; not interested in that area of the content curriculum

Not bright

Not paying attention

Disorganized

### WHAT'S HAPPENING IF IT'S REALLY A VISUAL IMAGERY PROBLEM

Children with poor visual imagery skills make spelling mistakes because they do not "see" words in their mind's eye. Instead, they write words as they hear them: *lisen* for *listen*; *ben* for *been*. Since only half the words in the English language are spelled phonetically, even a good knowledge of phonics will not turn these children into good spellers.

The child with poor visual imagery skills does not "see" flash cards when recalling number facts; once the card is out of sight, so is the answer. Additionally, the child does not "see" patterns among the number facts that would help with recall (e.g.,  $5 \times 7$  is the same as  $7 \times 5$ ; and  $9 \times 9$  is 9 less than  $9 \times 10$ ).

The child with poor visual imagery skills has not learned to simultaneously visualize while reading, and so has no mental "pictures" for reference when trying to remember information during a test. Instead, the child relies on short-term memory, which often fails under stress.

A child must have efficient recall of literal information in order to synthesize, analyze, evaluate, and apply that information. The child with poor visual imagery skills has difficulty creating that literal base, and so has nothing to draw on when asked to think critically.

The child with poor visual imagery skills has not learned to simultaneously visualize while listening to directions, and so has no mental images to help with recall.

Children with poor visual imagery skills cannot "picture" where they have placed something; instead, they must rummage through everything until they come across it.

## 7. EYE-HAND COORDINATION IN THE CLASSROOM

With good eye-hand coordination, our eyes, brain, and hands work together.

<b>WHAT WE SEE</b>	<b>WHAT WE MIGHT THINK</b>	<b>WHAT'S HAPPENING IF IT'S REALLY AN EYE-HAND COORDINATION PROBLEM</b>
Illegible work	Sloppy; rushed through work	Children with poor eye-hand coordination cannot get their hands to create what they see; therefore, their writing will not resemble acceptable form.
Does not write on the lines of the paper	Sloppy; rushed through work	Poor eye-hand coordination makes it difficult to stay on the lines. The child may see the line, but not be able to keep the words on it when writing. The inability to stay on the lines might also reflect poor eye-movement control or poor eye teaming.
Poorly spaced work	Sloppy; rushed through work	A child with poor eye-hand coordination may understand the concept of uniform spacing between words but not be able to produce consistent spacing. Again, another visual problem may be involved. For example, uniform spacing can be affected by poor eye-movement control; large spaces may result when the child's eyes overshoot their target.
Slow to copy information off the board or to copy sentences from rough draft to final draft	Daydreaming; short attention span	The child with poor eye-hand coordination needs additional concentration just to write the letters of each word. This extraordinary concentration slows the child's completion of the task.
Hates writing	Personality preference	Since writing letters is such a time-consuming, difficult task for children with poor eye-hand coordination, they may well have negative associations with anything requiring this skill.
Has trouble with multidigit computation problems	Needs more practice with basic facts	The child with poor eye-hand coordination will find it difficult to align the numbers in math problems. When alignment is off, an incorrect answer may result.
Has trouble catching a ball or playing many sports	Uncoordinated	If the eyes and the hands are not working together, then it will be difficult to catch a ball or to meet a pitched ball with a bat. In such cases, the child's hands don't respond in synchrony to what the eyes see; the result is a dropped ball or a strike.



## 8. VISUAL CLOSURE IN THE CLASSROOM

With good visual closure, we can "fill in the pieces" to see the larger, complete picture.

### WHAT WE SEE

Takes a long time to come to a conclusion

Keeps coming back for more directions and more explanations for doing a task; seems to need every detail explained

Can do parts of an assignment (e.g., take notes and make a bibliography) but can't put the individual parts together to complete the assignment (e.g., write a report on the colonies)

Has poor reading comprehension

### WHAT WE MIGHT THINK

Slow thinker

Not an independent worker

Disorganized

Needs more practice reading and answering questions

### WHAT'S HAPPENING IF IT'S REALLY A VISUAL CLOSURE PROBLEM

A child who has trouble with basic visual closure tasks will have difficulty applying such skills to abstract reasoning that requires coming to a conclusion.

A child with visual closure problems makes no inferences and thus has to keep coming back for more information.

A child with poor visual closure cannot see how each of the parts leads to the end, and therefore cannot put the parts together to finish the assignment.

A child who has visual closure problems has trouble inferring information; in reading, this leads to difficulty with comprehension questions that call on higher-level thinking skills.

## 9. LATERALITY AND DIRECTIONALITY IN THE CLASSROOM

With good laterality and directionality skills, we have a reliable reference for knowing where everything is in space; that reference then gives us a sense of order when we look at printed text.

### WHAT WE SEE

### WHAT WE MIGHT THINK

### WHAT'S HAPPENING IF IT'S REALLY A LATERALITY AND DIRECTIONALITY PROBLEM

Is inconsistent in following directions on where to write name, date, and similar items on a page

Not paying attention

A child with poor laterality skills may truly not know left from right, but of course has a fifty-fifty chance of getting it right; thus the inconsistency.

Has difficulty following directions to find another classroom and may have trouble navigating through the school

Not very bright; not paying attention

A child who cannot visualize directions in space will often get lost or turn the wrong way.

Cannot follow dance-step routines or exercise instructions during physical fitness activities

Not paying attention; goofing around

Instructions such as "Bend your right knee" or "Take three steps to the left" are not enough guidance for students with poor laterality skills, who will often inadvertently move in the wrong direction if they try to follow the words instead of a model.

Reverses letters and words

Possible referral for Student Study Team assessment

Children have to understand their own laterality before they can "see" the direction of specific letters or letter combinations, such as **b** and **d** or **saw** and **was**.

Writes many letters (such as l, e, f) from the bottom up

Sloppy handwriting

Same as above.

Skips over words when reading

Not paying attention

When children have difficulty crossing their own midline, the eyes may take a "hop" instead of smoothly crossing the visual line when reading; this hop may cause children to skip over words.

# 10. AUDITORY-VISUAL INTEGRATION

With good auditory-visual integration, we can process what we hear, in sequence, and then match what was said to a visual representation.

## WHAT WE SEE

Slow to answer questions

Slow to follow transitional directions ("Put away your journal, take out your math books, and turn to page 65"); always lags behind the rest of the class and often asks for directions to be repeated

Can't remember the directions for independent work or for a learning station

Has trouble spelling

## WHAT WE MIGHT THINK

Not very bright

Not paying attention

Not paying attention

Didn't study enough; poor memory skills; doesn't know phonics

## WHAT'S HAPPENING IF IT'S REALLY AN AUDITORY-VISUAL INTEGRATION PROBLEM

As soon as a question is asked, children without auditory processing problems are already thinking about the answer. This simple one-step process becomes a two-step process for children with auditory processing problems. While the rest of the class is talking about the answer, these children are still replaying the question, and by the time they are ready to answer, the next question has already been asked.

A child who is not processing information sequentially probably recalls only the last part of the instruction, "page 65." Out of context, this has no meaning. Confused, the child does nothing until it becomes obvious that everyone else has taken out the math book. At this point, the child probably won't remember the correct page and will likely ask for clarification: "What page are we on?"

A child who cannot simultaneously visualize information that is given orally has to rely solely on short-term memory to remember directions for independent work or for what to do at a learning station.

A child who can't hear the sequence of sounds in a word may transpose letters or leave out entire syllables when spelling that word. What these children write may match what they hear—but what they hear is not correct.

# 11. VESTIBULAR FUNCTION IN THE CLASSROOM

With a well-functioning vestibular system, movement of our bodies in space and time is automatic. This system is also vital to stabilizing the visual system.

WHAT WE SEE	WHAT WE MIGHT THINK	WHAT'S HAPPENING IF IT'S REALLY A VESTIBULAR PROBLEM
Rocks in chair	Hyperactive	The rocking movement may be the child's attempt to self-regulate his or her level of attention by increasing vestibular input.
Falls off chair frequently	Goofing around; not sitting correctly	All children move around in their seats, but the child with a vestibular problem may not get feedback in time to make an adaptive response to prevent falling off the chair.
Frequently tips chair so that it rests only on its back legs	A risk taker, attention seeker; disrespectful sitting position	Tilting and trying to balance on the back legs of a chair provides vestibular stimulation and increases the child's sense of orientation in space.
Trips easily; bumps into furniture	Clumsy; goofing around; not paying attention	The child's movement receptors may not be supplying adequate information, at least not in time for the child to make an adaptive response and avoid an object in the way.
Is always touching everything	Impulsive; immature	Children with inadequate vestibular feedback about their location in space will often need to rely excessively on tactile information.
Moves in an awkward, uncoordinated way	Clumsy; physically immature	When the child's vestibular system is not providing critical input about what is moving (a body part, the whole body, or the environment), in what orientation, how fast, and in what order, the result is uncoordinated movement.
Unable to maintain focus on moving objects	Inattentive	When the child's vestibular system does not provide a stable reference for integrated neck and eye movements, then fixation, tracking, and eye teaming may be compromised.
Hesitates or declines to join in physical activities	Lacks confidence; sedentary personality	For a child with a hypersensitive vestibular system, all movement is "scary" because it cannot be accurately interpreted or controlled.
Has social and emotional problems	Problems at home	Children with a vestibular problem lack the emotional security of knowing what's going to happen with their bodies when they jump and run and play. They may become manipulative and controlling in order to feel safe, and their insecurity may lead to abnormal anxiety.
Gets in people's personal space	Rude, or unaware of accepted space boundaries for communication	Children who do not know where they are in space cannot always tell when they are invading the space of others.

## 12. EYE TEAMING IN THE CLASSROOM

With good eye teaming, the two eyes align together to see one object.

### WHAT WE SEE

### WHAT WE MIGHT THINK

### WHAT'S HAPPENING IF IT'S REALLY AN EYE-TEAMING PROBLEM

Rests head on arm while writing; turns paper to extreme angle when writing; sits in awkward position while reading or writing

Tired; personal preference

When the two eyes do not align correctly, the child may unknowingly discover an adaptation that eliminates blurry or double vision. In certain body positions, only one eye is doing the seeing, so the alignment problem disappears. However, although the blurring and double vision are gone, research shows that use of one eye will reduce the child's visual pathways to the brain from 80% to just 20%.

Covers one eye when reading or writing

Goofing around

By covering one eye, this child may achieve the same effect as those who adopt awkward positions to suppress one eye.

Buries head in a book when reading

Likes the book

If the eyes overconverge when trying to align, then the child will see things smaller than they actually are. The only way for this child to make the text larger (and readable) is to bring the page closer to the eyes.

Complains of being tired after reading or writing for a short time

Whining personality; doesn't get enough sleep

If the eyes have the tendency to turn outward when trying to align, then the child has to expend extra energy and effort to realign the eyes with every eye movement, and thus quickly tires.

Has poor reading comprehension

Needs more practice reading and answering questions

When text blurs, a child's eyes may see the ending letter of one word shift into the next word. Likewise, when the eyes go out of alignment, the child may miss three to five words while the eyes are trying to realign. All these obstacles make reading comprehension a challenge.

Doesn't stay focused when reading or writing

Attention deficit problems

Often, a change of focus is a "quick fix" for an eye-teaming problem. If the child looks out the window, the text may not shift or be blurry when reading is resumed.

Avoids reading or writing

Personality preference

This avoidance is actually an adaptation. A child who isn't reading or writing has found a way to eliminate the problem of blurry or double vision.

Has poor handwriting; uneven spacing

Rushes through work

Poor handwriting may be the outcome of a child's distorted visual input.