



VISUAL PROCESSING DISORDERS

**WHEN 20/20 VISION
IS NOT ENOUGH!**

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What are Visual Processing Disorders?



Visual processing disorders are problems that fall outside of the normal visual acuity definition (near or far-sightedness). Children with these disorders may “see” just fine but their brains do not process the information correctly. Because the problem is with the student’s brain processing, many of these students will have perfect 20/20 vision when tested. In light of this, a teacher can understand why so many of these students are not diagnosed until they experience significant failure in school.

So, how can we determine whether a student is having difficulty with visual processing? We will eventually cover specific information for each disorder, but to get started; here are a few rules to follow:

1. **ASK the child what they see** I know this sounds so common sense, but I cannot tell you how often I will work with a child who has been referred for inattention or behavioral problems, and when I ask them about their vision, they will casually state that they see two of everything! Children have these problems for long periods of time. The problems *come on so slowly and so early the students do not remember ever seeing in a different way*. This means a casual question of, “Can you see that OK?” will not work. They will just answer “yes” because they know nothing else.

So, be specific when you question a student. Ask whether they are seeing double (define this for younger children). Ask them whether they are skipping lines, losing their place when reading, etc. A quick questionnaire for your use can be found online at www.Neuro-Teach.com under the Processing tab.

2. **Look at academic work** Again, this seems so common sense, but we often do not notice the little clues a student may give us about their vision. Is the student always missing a section of their work? Do you see the child turning their head from one side to another while they are working? Do they complete some work well and other pieces poorly---if so, can you see a pattern? Is there a difference in how crowded the work is or how large of a font that was used? Is there more white space between the sections? Look for any information you can get....

3. **Observe movement around the room, in gym and at recess** Many students with visual processing problems move poorly. They bump into people, their materials, or toys, and seem to be accident-prone. You may see them walking well in the hall, but the minute they come to a staircase, they pause and seem to have difficulty. Sometimes parents will report the student gets car-sick easily, or you may notice they have difficulty on playground equipment like swings or merry-go-rounds. A physical education teacher may report incidents where the student consistently misses catching or kicking balls. Just remember that eyesight is much more than academic work and many of our clues will be found outside the classroom.

4. **Take a VERY close look at any child being referred for school failure, attention problems or behavioral issues** Imagine what it must be like to be in a classroom for approximately 6 hours per day and being unable to see well. It is not hard to understand why such a student would eventually avoid schoolwork and let their mind drift. It is also not difficult to see how they could eventually “find something else to do” especially if they are bright and bored. In other words, we may be missing the **cause** of academic failure, ADD/ADHD, and behavior issues if we do not look closely at visual processing (and for that matter, Central Auditory Processing, Dysgraphia, Sensory Processing, etc., etc.). It saddens me to see so many students misdiagnosed, especially with ADD and ADHD. Those checklists (i.e. to screen for ADD/ADHD, etc.) are useful, but they can only document the behavior you are seeing. They do not do a good job of determining the *source of the behavior*. It is up to YOU as the teacher to add some common sense back into the mix and look at these other issues...

Types of Visual Processing Disorders

So what are the different types of visual disorders? While you may see different professionals categorize them in various ways, we will be looking at the following three main groups in this document:

Eye Movement and Control Problems

These problems emerge when the muscles of the eyes do not work properly and/or one eye does not function well so the brain begins to turn “off” that eye to control the sensory input. When eyes do not move together or only one eye is functioning, it is difficult to complete almost all academic tasks. In many cases you will see one of the eyes out of alignment (off-center) periodically, if not most of the time.

Visual-Spatial Perception Problems

These problems stem from how the brain perceives what the eyes are seeing. In these conditions, the eye is taking in the information properly, but the brain is not putting it together in the manner it should. Because vision is a very complex process, the brain really controls the process. You may think you are seeing what you are seeing, but in reality, much of vision is actually created in your brain. When that creative process does not work properly, some pretty strange problems can occur. Some of the most unusual and difficult visual processing disorders will fall in this category.

Additional Problems

The last section will focus on problems that do not fit readily into the other two categories.

On the next page you will find a quick chart of the various conditions we will be looking at in this unit.

PLEASE NOTE: *The intention of this unit is to give you enough information to note possible problems and assist families in obtaining the proper medical diagnosis through a qualified professional. It is not meant to be used by educators to diagnose the student within the classroom. I KNOW you know this, but it is best to mention it directly 😊*

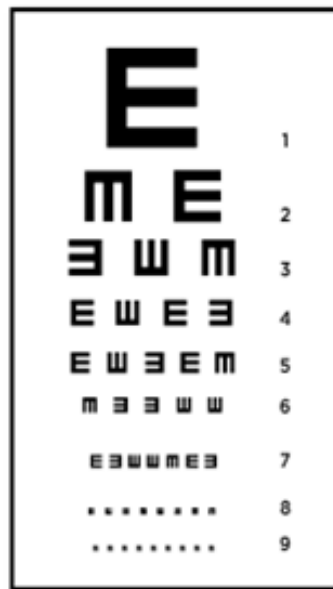
Processing Issue	Source of Problem	What you may see....
Teaming	Eye Movement & Control	<ul style="list-style-type: none"> ▪ Blurred or double vision ▪ Loses place when reading
Convergence Insufficiency	Eye Movement & Control	<ul style="list-style-type: none"> ▪ Difficulty seeing from board to desk and back ▪ May easily lose place or work very slow
Visual-Field Cut	Eye Movement & Control	<ul style="list-style-type: none"> ▪ May routinely leave same portion of paper blank ▪ Will not notice missing area until it is pointed out
Visual-Closure	Visual-Spatial Perception	<ul style="list-style-type: none"> ▪ Cannot recognize objects if part is covered ▪ Will lose objects or be unable to find them
Figure-Ground Discrimination	Visual-Spatial Perception	<ul style="list-style-type: none"> ▪ Will not notice items against a crowded background ▪ Has difficulty with picture and word searches
Gestalt	Visual-Spatial Perception	<ul style="list-style-type: none"> ▪ Will copy item outlines but miss inner detail OR// ▪ Copies items but separates pieces in strange manner
Face Blindness	Neurological / Gestalt	<ul style="list-style-type: none"> ▪ Cannot recognize familiar adults and peers ▪ Cannot recognize own picture

Diagnosis

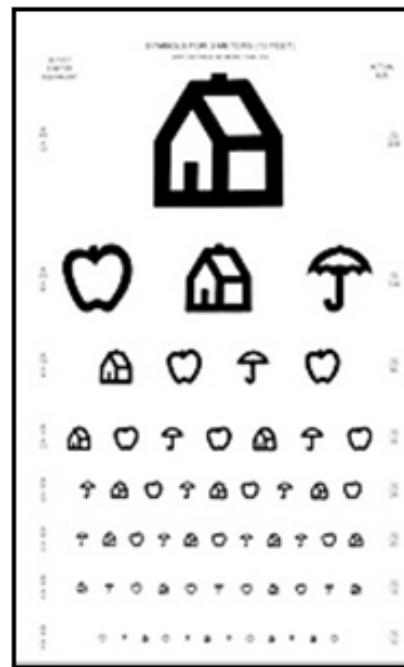
There are many wonderful eye doctors in the world, but they have different specialties and experiences. Because of this, you should advise families to search for doctors who have experience diagnosing visual processing problems in children.



Snellen Chart



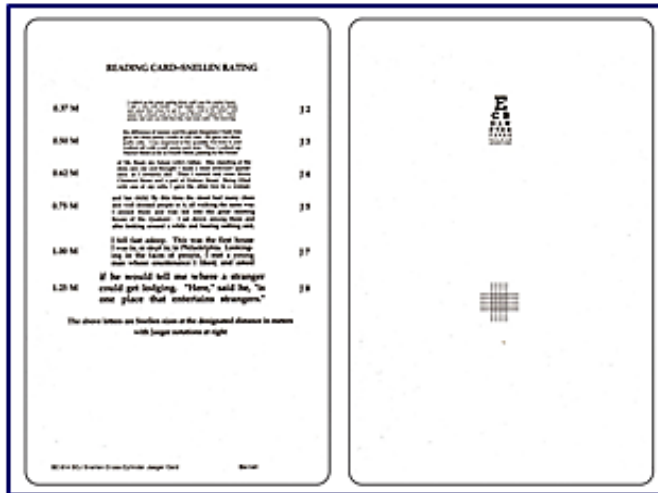
Tumbling E Chart



Allen Chart

The typical visual acuity exam determines whether a person can see a letter or symbol at 20 feet. The traditional chart most commonly used was developed by a 19th-century Dutch ophthalmologist named Hermann Snellen (1834–1908). This chart is now known as the Snellen chart. Other versions (Tumbling E and Allen Charts) are used for younger children who may not know their letters.

It is important to realize that these vision charts can only determine distance vision (acuity); they do not determine anything else. Other tests must be run to to examine near vision and how the eyes are working together or perceiving stimuli. While most eye doctors *do* routinely screen for color blindness and misc. medical conditions, many do not perform these other tests in a routine eye exam.



Examples of “Near Point” Charts



To make matters worse, many children are not screened outside of school or a yearly physical performed in a medical doctor's office and most of these locations only have the ability to run a simple 20/20 chart of some form. These children never see an actual Optometrist or “Eye Doctor” let alone experience these other exams.

This is why so many students with visual processing problems are missed for so long. These children may test as having

perfect “20/20 vision” in the school setting or their yearly physical so no one looks any further. You have to test specifically for these other conditions and it is just not happening on a routine basis.

So, what should a family look for if they suspect their child has a visual processing problem? Well, the normal test for Visual Acuity at a Distance (normal 20/20 chart) must be done, but in addition, here are the other tests they should request:

1. Visual Acuity at Near Distances (Near Point or Reading charts)
2. Eye Teaming Ability (Two eyes working together)
3. Eye Movement and Control Ability (Tracking and other skills)
4. Eye Focusing Ability (Keep focus when looking Near→Far and Far→Near)

If one of your families cannot locate a doctor, the College of Optometrists in Vision Development can be a wonderful resource for locating a professional in your area. Their site also contains a wealth of information on vision development. The website can be found at <http://www.covd.org/>

Lastly, many of the tests used to examine visual perception (rather than medical eye function) are completed by other professionals, often Occupational therapists. Attempts are made to keep these tests “motor-free” so the ability to write and/or exhibit eye-hand coordination does not impact results.

Examples of motor-free tests include:

- The Developmental Test of Visual Perception
- The Test of Visual-Perceptual Skills
- The Motor-Free Visual Perception

Test that use some motor skills (i.e. writing or drawing) are used if the fine motor skills will not impact scores. Some of these tests include:

- The Bender Visual-Motor Gestalt Test
- The Beery-Buktenica Developmental Test of Visual-Motor Integration
- The Frostig Developmental Test of Visual Perception
- The Test of Visual-Motor Skills-3

Treatment



Treatment of visual processing disorders can be somewhat complicated. We are all familiar with students who have worn eye patches, but there really is much more to visual treatment----and also a great deal more controversy as well. For example, some that feel that eye control and movement problems are best treated through a combination of patching and surgery by an Ophthalmologist (eye surgeon). Others feel surgery should be a last-resort type of option and instead vote in favor of Vision Therapy, a treatment program that attempts to train the eye and brain to respond more appropriately to visual stimuli.

I personally do not favor one of these options over the other. I have seen all used successfully, depending on the situation. In other words, that is a discussion best left between the diagnosing professional and the family since it is dependent on the student's particular case. That said, I do feel it is important to understand the nature of Vision Therapy. It is an amazing process and students going through it need your support. It is also good information since some of the simpler games and activities can be used casually in the classroom. Here are some links to get you started:

<http://www.covd.org/?page=Research> (research)

<http://grantvisioncare.com/vision-therapy/> (FAQ)

<http://www.visiontherapy.org/> (general info.)

<http://pinterest.com/covd/vision-therapy/> (examples)

<http://www.childrensvision.com/photos.htm> (photos)



General Classroom Solutions

We will eventually cover solutions for specific vision problems, but there are many general strategies you can use to make visual processing easier for all students, especially the child that is just developmentally young.

Here are some approaches to try:

- Enlarge print
- Use **Comic Sans** (free) font or **KG Neatly Printed font** (usually requires fee to download)
- Break visual tasks into small steps
- Give examples and draw pictures
- Reduce the color intensity or contrast of the computer screen
- Directly point out visual details in illustrations and other graphics
- Do not have students transfer work between papers or between the board and a paper
- Use color-coded, darkened or raised lines for students having difficulty
- Teach the students to use a reading placer (their fingers, ruler or a paper window)
- Teach students to scan papers and their visual field (using their fingers as a guide can help)
- Outline information when reading demands are high
- Allow students to “rest” their eyes periodically
- Allow older students to record information and/or use a buddies notes to supplement their own
- Play games that teach visual attention, scanning and other tracking and visual-coordination skills

Visual Contrast Sensitivity

This may be too hard to read

This may be easier to read

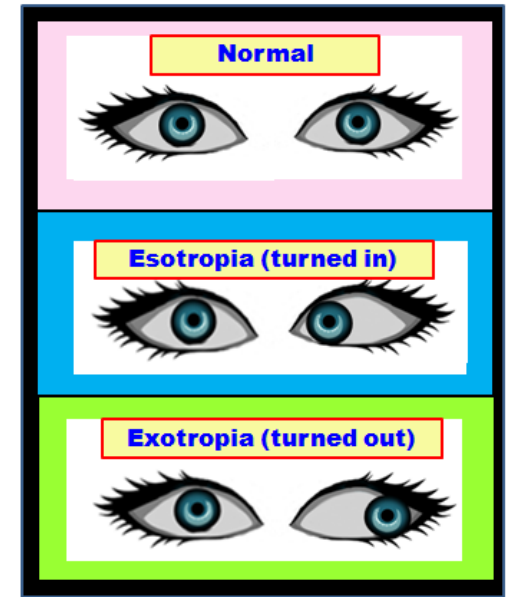
Eye Movement & Control Problems

Teaming Issues

Description

Our two eyes are made to work together. The eyes should move smoothly and be equal in strength in order for three-dimensional vision to operate. If for some reason the eyes are not working together then the brain has to decide what to do. In most cases, the brain will choose one eye to use and begin to ignore the other eye. This eye will eventually appear “out of alignment”.

When an eye begins to move out of alignment it is formally known as **Strabismus**. If Strabismus goes on too long, vision in the off-center eye will weaken and the eye begins to “turn off” in order to control double vision. This semi-permanent decrease in vision is called **Amblyopia**. It is important to realize that even with glasses, the affected eye may not be able to process vision properly since this is a problem associated with the brain’s processing. In some cases, the brain will start to use one eye for distance vision and the other for near vision and three-dimensional vision is lost.



What You Might Notice in the Classroom

The most obvious sign of a teaming problem is with eye alignment. You will notice that one eye is not pointing in the same direction as the other eye. Please know that this non-alignment is not always constant nor is the same eye always affected. You may see the non-alignment come and go and the eye actually move off-center as you watch. This “wandering” eye is often the first sign a teacher will notice. Other behaviors you might see is the child squinting one eye, turning their head to use the two eyes together (this may be VERY subtle, so watch carefully!) and evidence or complaints of double vision.

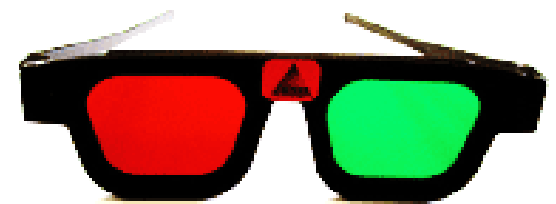
Lastly, if you look closely at the pupils of the eyes, you can see a reflection of what the child is seeing. In children with Strabismus, this reflection will not be symmetrical.

One interesting item to note is that the larger the difference in alignment (i.e. the bigger the angle), the **less** the child will complain about headaches or eye strain. When the eye is that far out of center, the brain essentially gives up and does not attempt to make the two eyes work together so there is little eye strain. However, when the eye is only slightly out of alignment or the problem comes and goes, eye strain can be severe and headaches common. So, if a child is complaining of eye problems or headaches but you do not see any problems with alignment, it may be that the problem is only emerging. Any time a child has the physical symptom of pain/strain; it should be looked into, regardless of the lack of other signs.

If Strabismus goes untreated, eventually Amblyopia will develop. When this happens and an eye begins to turn off, you may see more signs of the child tilting their head one way or the other to see. You may also begin to see clumsiness as three-dimensional vision is depressed. This will especially be seen in tasks that require depth-perception (i.e. reaching for objects, catching balls, etc.). Some children may eventually go as far as to cover one eye when reading or trying to see objects at a distance.

Typical Treatment

The two main treatments for this type of teaming problem are either Strabismus surgery that will repair the eye muscles and realign the eyes and/or vision therapy. Either of these methods may also include patching the stronger eye so the weaker one is forced to work or using prisms as part of the eye glass prescription. Glasses with one green and one red lens may be used to determine whether the child is suppressing one of the eyes and also for treatment of Amblyopia.



Classroom Activities to Strengthen Visual Teaming

The most beneficial thing a teacher can do to assist children with the development of their visual teaming skills is to make children aware of using both eyes. This can be done in the following way:

1. Let children know they should only be seeing “one” of something

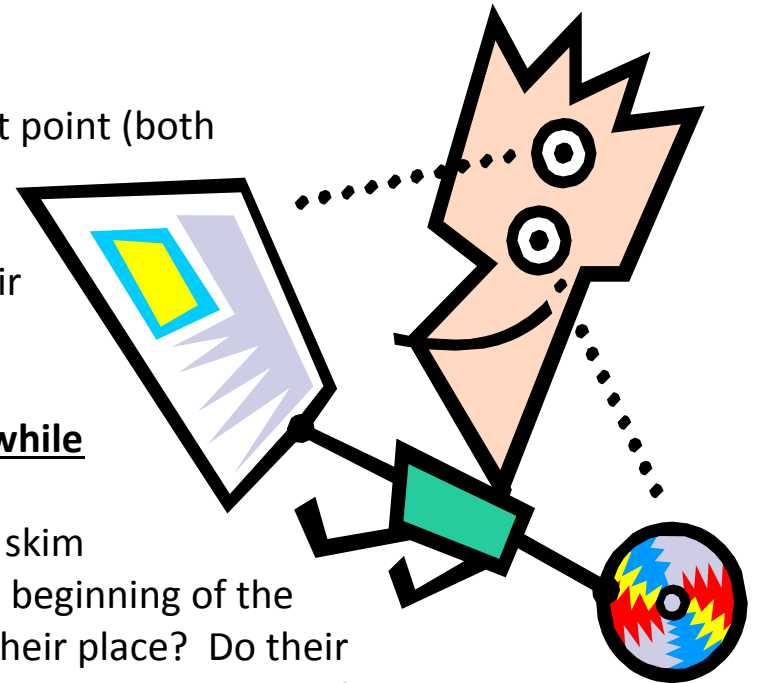
I know it sound simple, but children do not know this fact. I actually had one second-grader protest that I was wrong about this small piece information. As he said, “I have two eyes so I HAVE to see two of everything!” 😊 Needless to say, we had him tested and found out he had serious teaming problems. So, make sure to directly let children know they should only be seeing one, and if they have double vision, even if it comes and goes, they need to let you and their parents know!

2. Make students aware of how their eyes are moving

Simple games where children move their eyes to the farthest point (both right and left) without moving their head are easy to incorporate into the day. For example, can they turn their eyes to see a peer answering a question without moving their heads?

3. Have students pay attention to how their eyes are moving while they are reading

Bring visual tracking to consciousness by having the children skim sentences across a page and then bring their eye back to the beginning of the next sentence. Can they do this smoothly? Are they losing their place? Do their eyes jump around or start and stop? If they are struggling, have them use their finger to guide their eyes. If they find the task simple, how quickly can they go while reading...what about if they aren't reading but just skimming?



4. Play games where children visually track

Visual tracking is a skill that can be incorporated into many games. Here are some activities to try:

- Watch a rapid basketball game on video and try to keep track of the ball without moving your head
- Throw different colors of medium-weight cord into the air and let them land on the ground...track the pieces with your eyes. Younger children can first complete this with a toy car or animal. Note: The size, color and number of cords can make the task easier or harder.



-Complete simple word searches visually then by hand-----have the children find the word and then "circle it" with their eyes before circling it with their pencil. Circle short words one direction and long words another.

-Complete mazes with their eyes and then go back and complete them with their pencil. www.thinkmaze.com has mazes in both color and black and white for free download. An example of their beautiful products can be seen to the left.

-Play math games where children watch a swinging ball and count the number of swings to complete simple addition or subtraction problems.

-Practice simple spelling words by "writing" them with your eyes. This can be done in print or cursive. Younger children can draw shapes or simple pictures.

NOTE: These games (*and all that follow for other visual processing problems*), though simple, do demand a great deal of the eye muscles and may be uncomfortable if done too long. They should be used only once a day and for a very limited time period, especially at first. If a student cannot manage even "eye writing" one word or complete the most basic games, it could be a sign of a possible problem and steps should be taken to obtain a medical screening.

Eye Movement & Control Problems

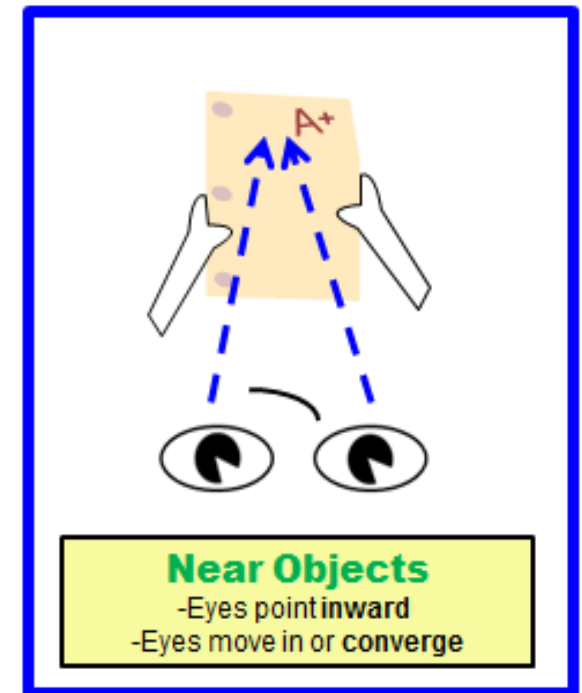
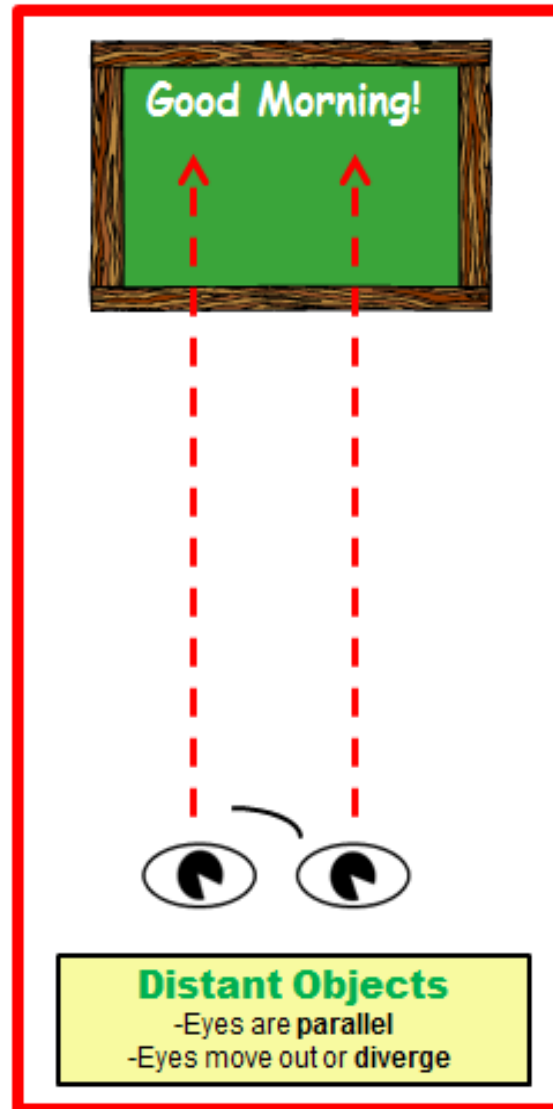
Convergence Insufficiency

Description

Our two eyes were not meant to always point straight ahead. The eyes change position depending on whether they are looking at something far away like a bulletin board or something near like a paper on a desk.

When the eyes look at something far away they are in parallel position, and when focusing on something near, they turn inwards or converge.

This ability to diverge and converge is very important. It should happen seamlessly and focus should never be lost as the eyes move from their desk, to a teacher across the room back to their desk and then slightly away to a peer next to them.



If this cannot happen smoothly or the student has to pause and regain their focus, the problem is known as Convergence Insufficiency.

What You Might Notice in the Classroom

Convergence Insufficiency is more subtle than Strabismus. Some students will show signs of eye fatigue, headaches and double vision, but more often than not, there are no strong signs associated with the condition.

Instead, what you will see is a child that is failing to complete work and struggling in school. They will not be able to attend or concentrate. They will have difficulty reading, trouble remembering what is read and words may appear to float or move off the page. In addition, some will show sleepiness during academic activity or motion sickness. It is important to note that most children with Convergence Insufficiency will often have 20/20 vision!

As you can also see, many symptoms of this condition mimic other problems like ADD, ADHD, LD, etc. This is why it is so important to become aware of these visual problems. Many children are being misdiagnosed and not improving because the source of their true problem goes undetected.



Typical Treatment

Treatment for Convergence Insufficiency is also more complicated. While surgery may be recommended, it is very rare.

In most cases the student will be given some form of vision therapy to complete. In some cases the condition is so mild the work occurs totally at home. In most situations, though, formal vision therapy will be used. In those cases the student will be completing general activities but also using computer-based programs and other forms of equipment. In addition, patching of an eye or prisms in the student's glasses may also be used if eye alignment and/or strength are a concern. In many cases the prism glasses are only used for reading and other academic work.

Classroom Activities to Strengthen Visual Teaming

Many home-based therapies are used for this condition, so there are lots of well-known activities and websites that provide information and ideas. Here are a few to consider...

1. Make children aware of how their eyes focus, diverge and converge

Like double vision, most children are unaware of the fact that they should have no delay when they look from near- to-far and back again. Have them look at each other's eyes as they look at something far away and near. Teach them the words "diverge" and "converge" (they think they are SO cool to know this and usually will share it with their families and friends 😊). In other words, make the process known so the student can begin to sense if there is a problem.

2. Pencil Pushups

One of the most common exercises for this condition is a simple home activity that can easily be done in school. Have the children focus on one letter on the side of their pencil and keep that focus as they move the pencil toward their nose. They should stop the second they see double. The exercise is often done for 15 minutes a day, five or more days a week.

3. Eye Tag

Have the children look at something on the board (i.e. a calendar) and give them the same item in a smaller version to hold in their hands. Have them go back and forth between the two searching for the numbers (or letters) you call out. Have them note whether they have a delay in their ability to focus or see the symbol clearly.

5. Online Activities

Because much of this therapy occurs at home, there are multiple websites with electronic games/therapies. Here is one that provides wonderful step-by-step directions with pictures:

http://www.tedmontgomery.com/the_eye/VT/therapy.html

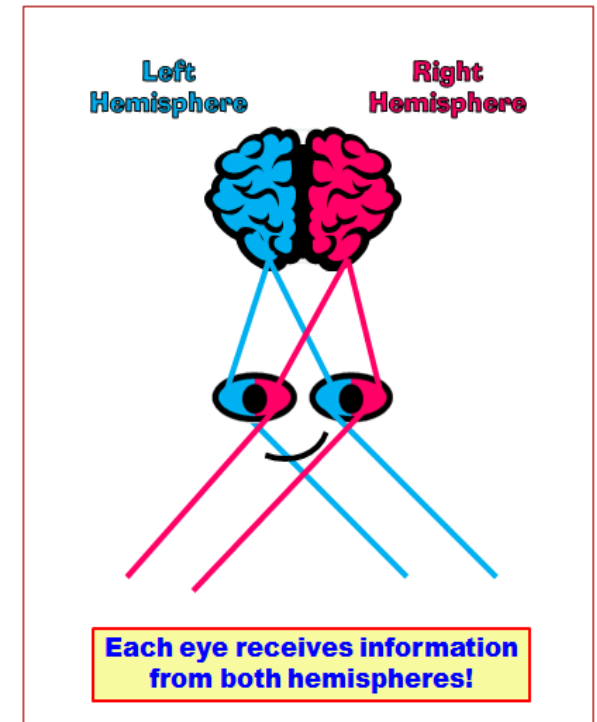
Eye Movement & Control Problems

Visual Field Cuts (Neglect)

Description

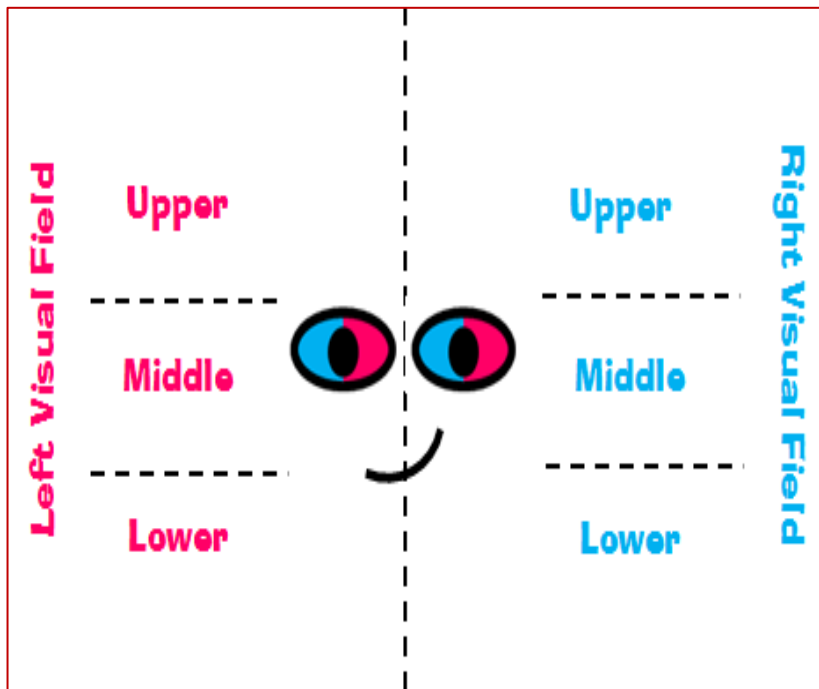
Most people know that the right hemisphere controls the left side of the body and the left hemisphere controls the right side. Based on that fact, you would think that the eyes would follow the same pattern, but that is not the case. Each eye is split, with half of it being controlled by one hemisphere and the other half by the other.

This is a good thing----this means if we lose one eye, we still have full brain involvement for the remaining eye and access to the total visual field if that eye and the brain are working properly.



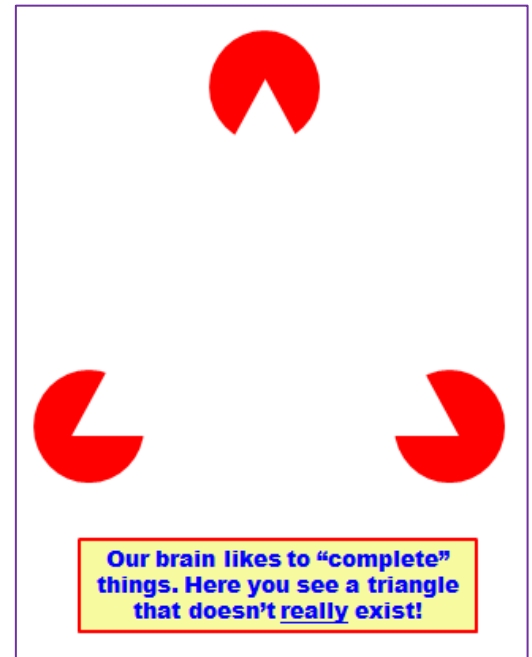
At times, though, the brain does NOT work properly and part of the visual field is lost. When this happens it is known as a **Visual Field Cut**. This cut can be expressed in one or both eyes, depending on where the problem is occurring. The most common source of visual field cuts is a stroke, optic nerve damage, and/or traumatic brain injury.

When someone has a visual field cut, they will “neglect” one part of the visual field----it simply does not exist for them. This is why this condition is also referred to as **Visual Neglect**.



Visual neglect is a rather strange condition in the sense that the person who has it WILL be able to notice the item they are not seeing, but usually only if the missing piece is pointed out to them. You might wonder how that could possibly be the case; don't they notice that there is a blank space in their vision? Well, that is the problem----**there is no blank space in what they are seeing!**

Our brains do not like vacuums. If something is missing, our brains will find a way to deal with that gap. In some cases the brain will just “not notice” the missing piece, but if the area is small enough, the brain will actually “fill in” the missing section through a process called **perceptual completion** or **confabulation**. The brain just guesses what it *should* be seeing based on past experience and the surrounding scene.



The real scene



What someone with an upper left field cut might see
(the brain just continues the wall)

An Important Note!

Visual field cuts and neglect follow each other. The cut in the visual field usually leads to the brain beginning to skip that side since nothing can be seen. When brain injury or another trauma like a stroke causes this condition, it can be improved, but may never totally go away.

In young children, though, neglect can also be due to conditions like eye motor control problems and other eye conditions. As these are fixed, the visual field is now normal, but the child may have developed a *pattern of neglect*. This habit of “not looking” or using their eyes well **CAN** be changed with behavioral assistance and therapy. This problem can especially be seen in the side or peripheral vision areas. With these little ones, you will need to remind them to “*use their side eyes*”. We will cover some strategies that can be used to assist these children on the next page.

What You Might Notice in the Classroom

So, what does this look like in the classroom? The signs of a visual field cut or neglect are there, but you must watch for them closely, especially because the clues may be subtle. Here are some signs to note:

- A pattern of missing a particular section of a paper
- Consistently not noticing people or objects on one side
- Neglecting to eat food in one section or side of their plate
- Drawing objects where part or half is missing
- Turns head back and forth to see rather than moving their eyes
- Unable to find missing objects that are plainly in view
- May squint and rub eyes
- May complain of headaches, fatigue and dizziness
- Chronically tilts head in a particular direction
- Loses place when reading



Example of Left Visual Field Neglect

(NOTE: Student will **NOT** notice the section is missing until it is pointed out!)

Typical Treatment

The approaches used for this condition depend on whether there is true damage (a visual field cut from brain or optic damage that is leading to neglect) or a developmental problem due to another eye condition (i.e. Strabismus that has slowly caused a child to neglect their peripheral vision).

If the problem is damage related, many different options may be tried including patching and stimulation along with compensation activities like scanning exercises and cues to remind the person to specifically look at the neglected part of their visual field. The success of these treatments will depend on the nature of the damage. Since neglect increases with fatigue, they are also taught to leave difficult and demanding tasks for times when they are rested.

If the problem is developmental and stems from another eye condition, the treatment include a mix of strategies to correct the eye condition that led to the neglect (i.e. removing double vision) and working with the student to become aware of their full visual field. Here are some examples of how this is done:

-Directly teaching the student to scan: You can introduce this concept by having the student compare looking out across a big area (usually the playground 😊) with their eyes and then with binoculars. Even if their visual field is narrow, they will see more with their eyes. Make them aware of how limiting binoculars are and how they have to turn their head to “see everything”.

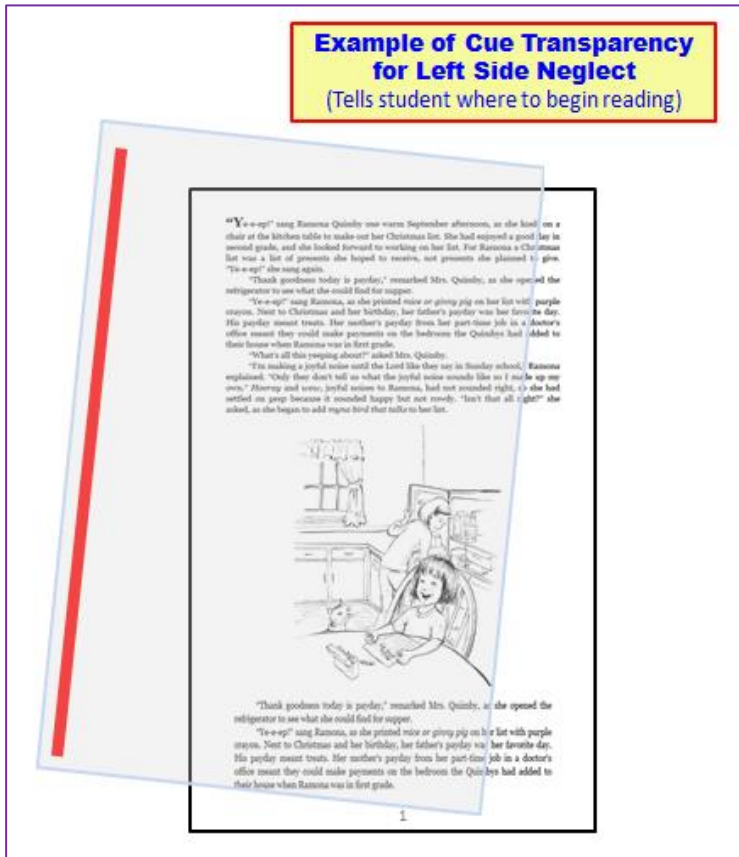
Relate this experience to their own eyes and explain that they are seeing only part of what their eyes can see. Then introduce the concept of opening their side vision, scanning all parts of their visual field, etc. This will take practice and a lot of reminding. You might want to use a visual cue (i.e. picture of eyes) that you can point to as a reminder.



-Develop a cue to help them remember to pay attention to their neglected side or area:

Example of Cue Transparency for Left Side Neglect

(Tells student where to begin reading)



This strategy is fairly easy to implement. Just use some type of visual cue or symbol (most often a red line) and place that cue on a transparency. Then lay this under the student's paper or over the student's book and teach them to "look for their symbol" and makes sure to complete or read that section.

For example, a student with left field neglect should be taught to look for the red line to remind them about where they should begin reading. A student with right field neglect can use a red line to signal where they should end reading.

Some children may need to use parts of their body (i.e. their finger) to assist their eyes, especially when they are first learning to use a visual cue reminder. This additional physical cue can be faded over time.

This approach can also be used at a physical level to remind children to "open their side eyes". For example a student who often neglects their peripheral vision can be taught to check themselves by holding up their own fingers at the very limit of their visual field. This type of reminder can be good to use right before the child is put into a situation where side vision will be important (i.e. going to physical education class, walking in the hall, going to recess, etc.)



Testing for "Side" Vision

Classroom Activities to Strengthen Use of the Full Visual Field

There are many games that can be used to strengthen this skill. Here a few you can try:

1. Teach children about their visual field and have them test where their personal field ends

As I have mentioned before, it is very useful to directly teach children about their visual field.

Depending on the age of the students, this can be integrated into a lesson on left and right, the Hokey Pokey, direction on a compass, etc. This game can especially be useful because you can see children who are struggling with a part of their visual field.

2. Partner games where children work on side vision

Play simple games where children work with a partner who is making faces, holding up pictures, writing numbers, etc. on the edge of their visual field. The goal is for the student to be able to see what they are doing. Any symbols can be used for this game, and it can be easily integrated into subject areas (i.e. addition problems or spelling words).

3. Round the clock or desk

Take a moment and have the children stare at the middle of their desk and try to see everything on it without moving their eyes. Have them picture moving around a clock to see if there is any part of their desk they cannot see. The same game can be played with children looking around the edges of the room.

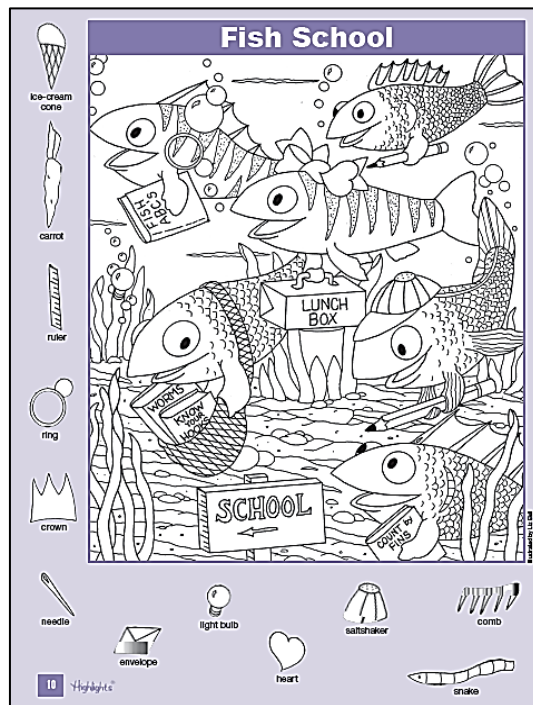
4. Scanning games

Any activity that incorporates scanning is useful. This includes scanning newspapers for spelling words or punctuation symbols, looking for pictures in “hidden picture” book, word searches, etc. Free hidden pictures like the one at the left can be found throughout the internet. Some of the best are on the next page for your convenience.



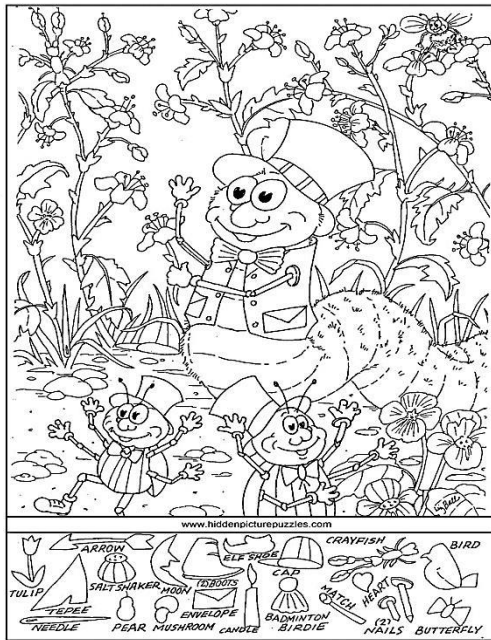
<http://www.highlightskids.com/hidden-pictures>

(free, online for children----the most loved source of these pictures!)

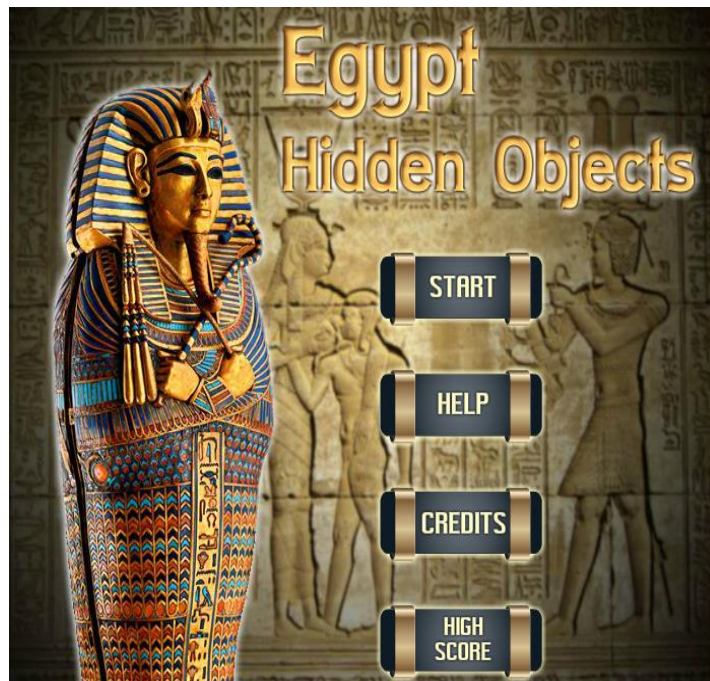


<http://www.highlightteachers.com/teachers-toolbox/hidden-pictures>

(free, online version for teachers....they are also printable)



<http://www.allkidsnetwork.com/hidden-pictures/>
(free, online for children....printable)



<https://www.hiddenobjectgames.com> (This is a free source that uses real pictures in color and more mature themes that are appropriate for older students. Games are interactive, have special effects, provide hints and are quite challenging! You will have to sit through some advertisements, but this site is a favorite of students...)

Visual-Spatial Perception Problems

Visual Closure Problems

Description

Visual Closure is a skill we often take for granted. The ability to “close an object perceptually” means that if shown only part of something, we are still be able to figure out what that object truly is. We are able to complete the object mentally even though we are only seeing a partial picture and/or receiving incomplete information. Not only is this skill critical for daily life, it is the key to being able to read smoothly and with speed.

What You Might Notice in the Classroom

A student experiencing problems with visual closure will often be a poor reader. They will need to move through words letter-by-letter and will find scanning with any speed virtually impossible.

These students also tend to lose objects easily since they cannot recognize them unless they can see the object's **total** outline. This means that they will not be able to find their own coat in a crowded locker and cannot locate simple objects like a pencil, book or eraser in or on a messy desk....even if they can see part of it!

In addition, children with visual closure problems may show related deficits in completing items mentally. They often cannot infer meaning from illustrations in a book, they cannot hypothesize outcomes (i.e. math equations and science experiments), and may also have difficulty formulating complete thoughts or sequencing actions.



Since visual closure is a skill that is related to many academic activities, you might also see problems in any of these areas:

- general writing skills
- completion of construction activities (i.e. art products) unless all steps are shown
- spelling, sentence and paragraph construction
- understanding of geometric forms and/or geometry
- problems with dot-to-dot s, puzzles or blurry worksheets
- ability to recognize pictures in stencil form
- using story starters or any other writing prompt
- work with geo-boards and other math manipulatives

Typical Treatment

If there are problems that might be impacting visual closure (i.e. strabismus, etc.) those will be treated medically in the manner typical for that condition.

Beyond that, most of the treatment for this condition is completed in a therapeutic setting with an occupational therapist and involve any number of visual-perceptual activities.

These activities can involve objects, familiar toys (i.e. puzzles) and various writing tasks. Since these activities can also be completed in the classroom, we will examine some of them in this next section.



Classroom Activities to Strengthen Visual Teaming

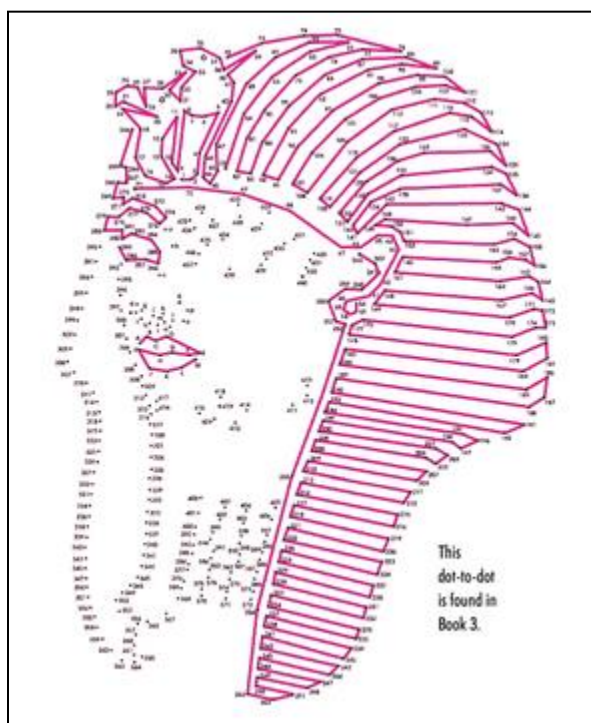
Let's begin with some strategies you can use to assist this type of student. Some things to consider include:

- Have student sit near the front and/or where they can see clearly (i.e. no barriers or covers)
- Keep worksheets, writing on the board and other visual very clear and sharp
- Give step-by-step directions and visual cues
- Guide students to find objects by having them locate features that do not change (i.e. color)

Some familiar activities to develop visual closure **as well as all other visual-perceptual skills** include:

1. Dot to dots
2. Puzzles
3. Word and picture searches with adult support (must use care so they are not frustrated)
4. "Fill-In" sheets (incomplete pictures, shapes, words or sentences---if difficult adult *must support*)
5. "Matching" (complete and incomplete pictures, shapes, words or sentences)
6. Stencils and rubbing pictures (i.e. picture appears as pencil is rubbed over---can they recognize the picture before they are finished?)
7. Scrabble and similar games
8. Construction of art projects, models, paper airplanes, origami figures, dioramas, etc.

The difficulty with some of these activities is the age-level. Please know that there ARE some very sophisticated and interesting products on the market that are wonderful for older students who need a little work on this skill. Just look on the internet and you will find some fantastic items ready for your use. Here are some links to get you started!



Dot-to-dot papers are not just for young children. Here is a lovely source of difficult dot-to-dots that can even keep an adult occupied!

[http://www.thinktonight.com/Advanced Dot to Dot Books s/204.htm](http://www.thinktonight.com/Advanced_Dot_to_Dot_Books_s/204.htm)

NOTE: Just make sure the level is not too hard for a student having visual closure issues. I have modified some of these to make them easier by partially drawing in pieces myself and whiting out the numbers. You can then photocopy to make a new (but easier) sheet that has that more “adult” theme but is easy enough for a struggling student’s success. Also, I have taken simple line drawings of my own, erased parts of the lines and added in my own dots using a graphics program. An easy way to make your own dot-to-dot (or letter-to-letter, month-to-month, etc. pages)!

Here is a nice game that allows older students to roll body parts of a monster or animal and then draw them. A nice idea that will keep both students who need this work engaged.

http://therapyfunzone.net/index.php?main_page=product_info&products_id=190

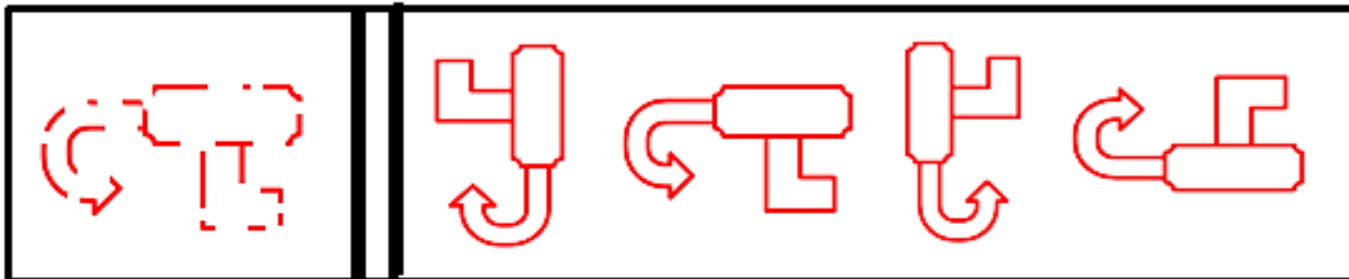


Here are some additional games you can search for or make....



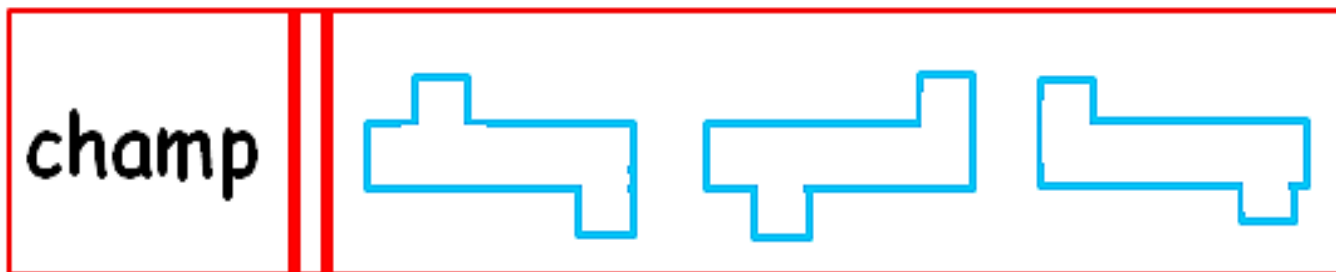
Masking games (part of picture is covered) that can be simple or complex scenes.

The degree of masking is easily adjusted.



Picture completion can involve simple pictures, complex shapes or even words.

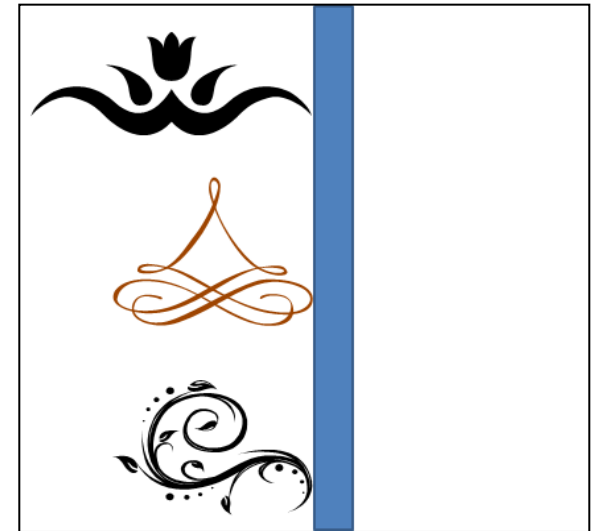
Sometimes students merely need to visually recognize the match....



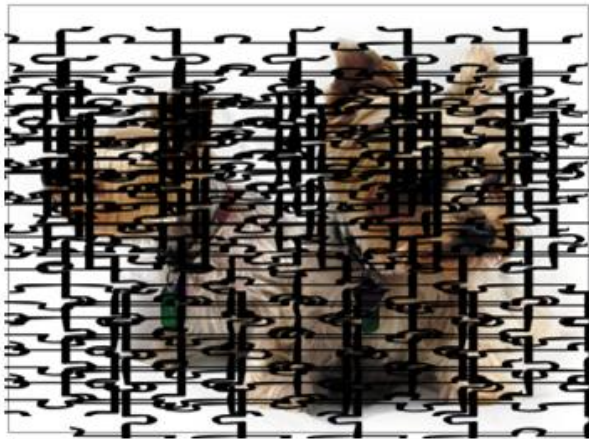


....and in other cases they are requested to **complete shapes** by drawing (example on left). These can become quite complex for older students (i.e. example on right....students are to draw the **mirror image**).

Regardless of the activity, you can easily make these items yourself, if you wish.



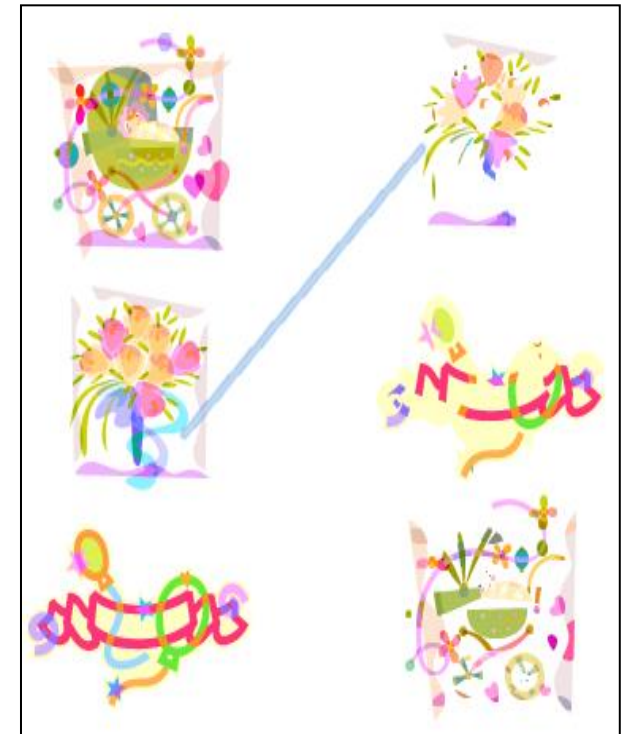
For example, the sheet on the left was constructed in a power point by placing a jigsaw png over the picture. You can also use a graphics program.



(NOTE: a png picture has no background so it can be placed over other pictures without obscuring them). By placing more and more jigsaw pngs over the picture, you can change the level of masking.



The example on the right was made by copying pictures and then using a graphics program to delete (or change to white) some of the colors.



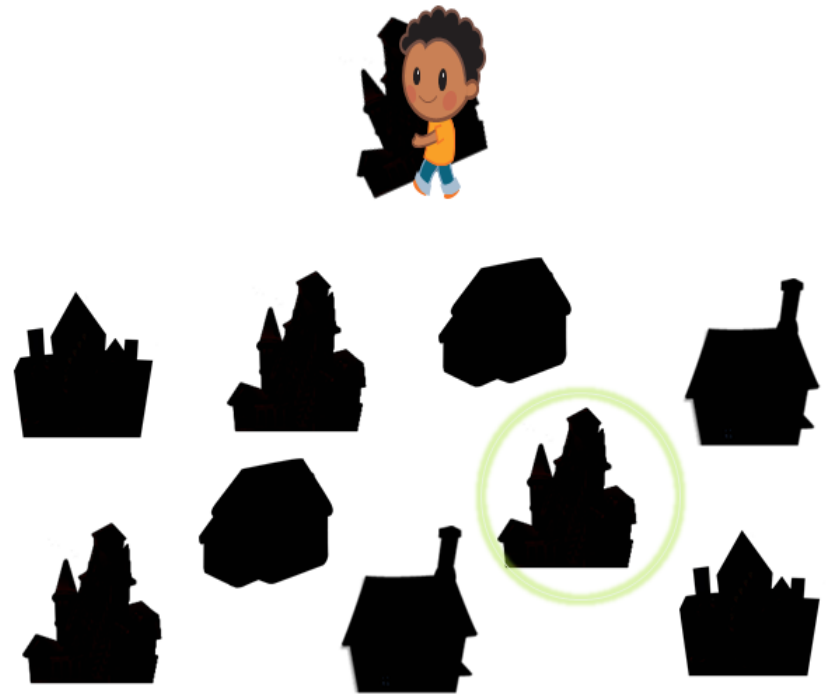


More ideas? The example on the right was created by taking several pictures (shown to the left) and converting them to black.



This can be done color-by-color, by changing the

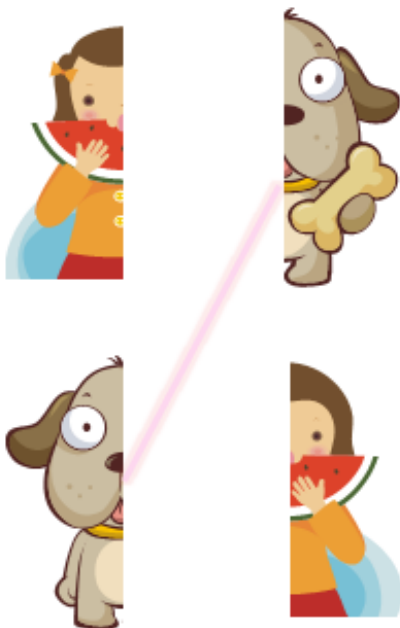
gamma (color concentration) to black or changing the contrast to its highest level. An easy way to produce any game you wish!



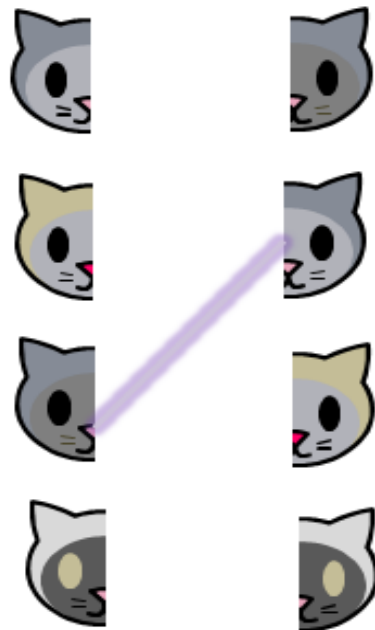
Whether you create these activities on your own (if you have time 😊) or look for commercial products, just make sure to really examine the level of the games you use.

The goal is to challenge the students who are typically developing while providing the support a student with visual closure difficulties might need.

With a quick glance, the differences in level are easy for any teacher to recognize, regardless of your level of experience with visual perceptions and their interventions.



Easier....



Harder....

Visual-Spatial Perception Problems

Figure-Ground Discrimination Problems

Description

The ability to see an object when there is distracting information in the background is known as Figure-Ground Discrimination. This skill is important because visual information is rarely given in isolation. Even as we walk, we have to be able to see the sidewalk against the grass, other pavement, toys, etc. In other words, figure-ground is an essential skill for life as well as academics.

What You Might Notice in the Classroom

Children with problems with these skills will not be able to pick out and keep attention on objects or pieces/details of an object if the background is crowded. These children may not be able to locate spelling words in a paragraph, words in a dictionary, find their place on a worksheet or location on a map. They often cannot locate their pencil in a messy desk, follow along in a book while someone else is reading, notice the details in an illustration or figure out where a teacher has written information on a whiteboard. They may also have difficulty with information presented in a sequence (i.e. do not notice the + in the problem $3 + 2 = \underline{\quad}$).

Typical Treatment

Like visual-closure, most of the activities are general enough to use in a regular classroom. Specialized therapies conducted by an occupational therapist or other professional may also include computer-based work, screening for color-blindness and other related issues. Many children with figure-ground problems may also need assistance with visual discrimination skills in daily life (i.e. movement through a crowded hall, finding lost objects, etc.)

Classroom Activities to Strengthen Visual Teaming

There are many activities to help students with figure-ground problems. Many of the items we have previously discussed like picture-finding activities can be used for this problem as well. In addition, here are general strategies you should consider:

1. Avoid too clutter in the room and on the walls and boards
2. Reduce the child's visual distractions by placing them in the front of the room
3. Enlarge worksheets
4. Use a book marker or guide to keep place when reading
5. Play games where attention has to be switched from one item to another
6. Limit copying from the board or transferring information (i.e. separate math answer sheets)
7. Use contrasting colors and highlighting when showing items on board or whiteboard
8. Highlight parts of the paper to complete, lines to fill in or pictures to cut
9. Teach orientation cues (i.e. color, right, up, side, etc.)
10. Practice searching for information (i.e. telephone book, dictionary, internet searches, etc.)

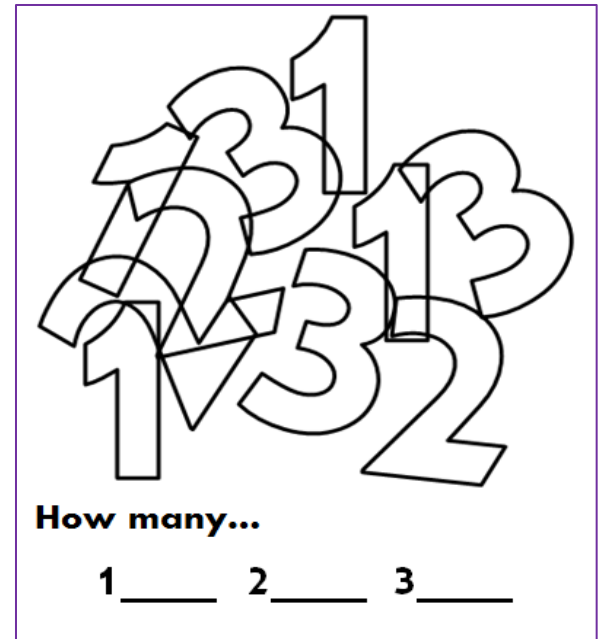
....and games and toys that can be very helpful:

1. Pick-up sticks
2. Jigsaws
3. Bingo
4. Board games (i.e. Candy Land, Chutes and Ladders---anything with a busy background)
5. Treasure hunts, "I Spy" games and "What Has Changed/Is Missing" pictures
6. Finding words, endings ("ing"), punctuation, etc. in paragraphs or in newspapers and magazines
7. Sorting and tracking (i.e. maze) activities
8. Pick out one type of object from a box containing a mixture of items
10. Hidden pictures and word searches
15. Create mosaics, paint-by-number or art projects that are constructed from a model or guide

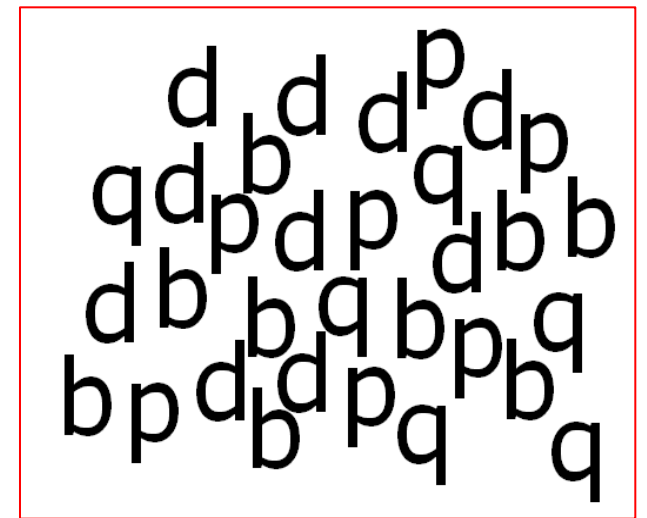
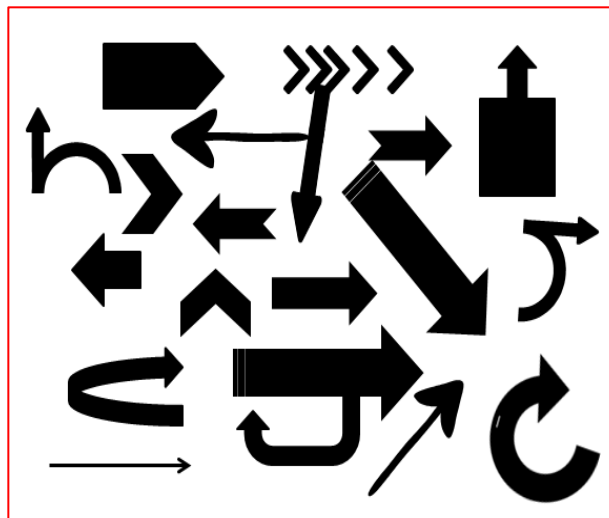


You can create simple sheets and games where students have to count the number of objects.

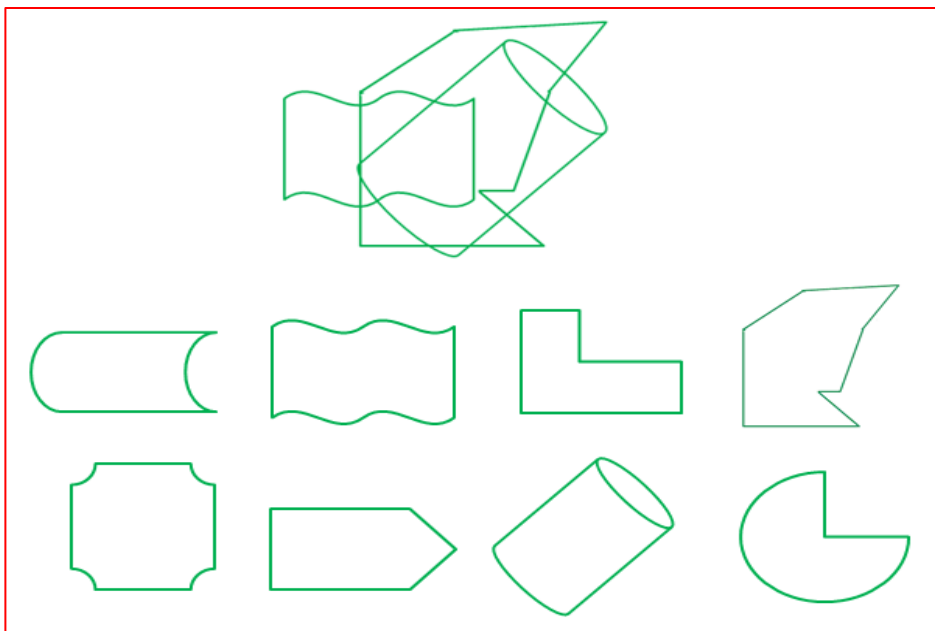
For example, students can count the number of flowers (on left), or a harder task, the numbers (shown on the right).



Scanning activities can range from very easy (finding a picture or “reading the pictures left → right” ----far left photo), to moderately challenging (finding an arrow direction----middle photo) to quite complex (finding a particular letter----far right photo). The level and complexity is easy to change.



It is not only the amount of detail or clutter that changes the task, but color can also play a large role. For example, the pictures on the left would be much easier to search for, match, etc. than the exact same picture on the right, now in gray-tone. You often can make a game more complex just by turning it into a black-and-white product!



Since many students with visual-perceptual problems are very intelligent, you may have to really think about how to make activities challenging and fun for the students.

For example, a shape finding activity can be very easy or much more challenging, as the example at the left shows. Think through how to keep the students interested and look for new products with the challenge your students might need...

Visual-Spatial Perception Problems

Visual Gestalt Issues

Description

Gestalt issues are rather difficult to research since many just group them in with visual-closure, visual-discrimination or figure-ground problems. You will sometimes see students labeled as having visual-gestalt issues, though, so I will at least mention them in this unit.

Gestalt perception deals with how details or objects are grouped together. Most feel that there are four variables that affect how the brain perceives objects and groups them. They are as follows:

1. **Closure**- Do the items complete a pattern
2. **Similarity**- Do the items seem to go together
3. **Proximity**- Are they close so the brain sees them as a “whole”
4. **Details**- Is there an implied symmetry or connection

Puzzles are used a great deal to develop gestalt-related skills. For example, a young child’s puzzle will have separate pieces like the one below.



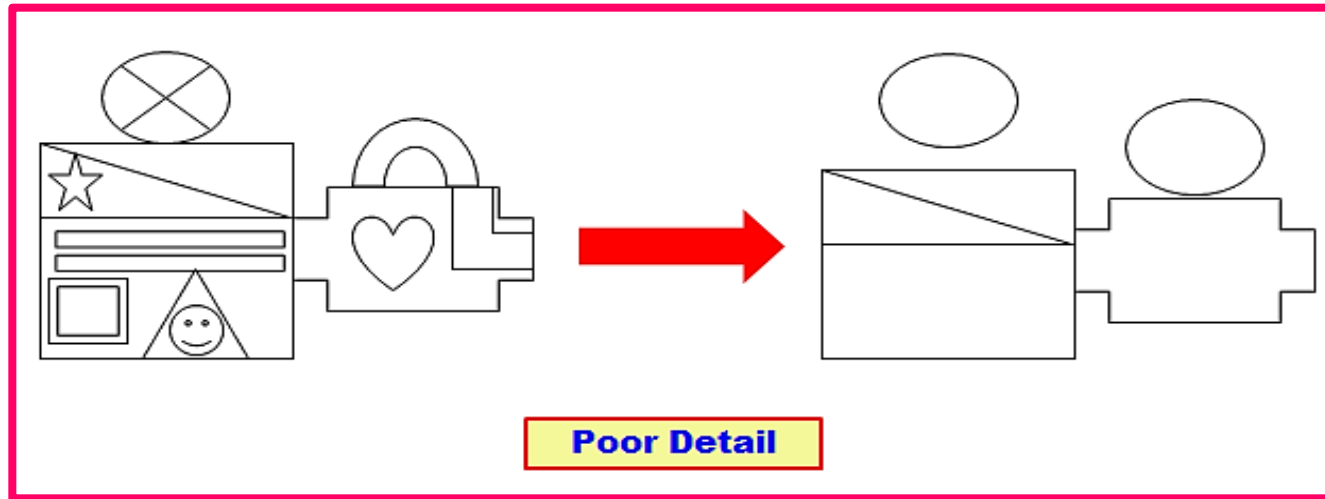
Eventually, though, we begin to force their attention to how those pieces go together. That transition can be seen in this puzzle to the right. The small details drawn on the puzzle back (i.e. grass) encourage the child to see the separate pieces of the ball, dog, bone, etc. as part of a larger, “whole” picture. Interesting, isn’t it 😊



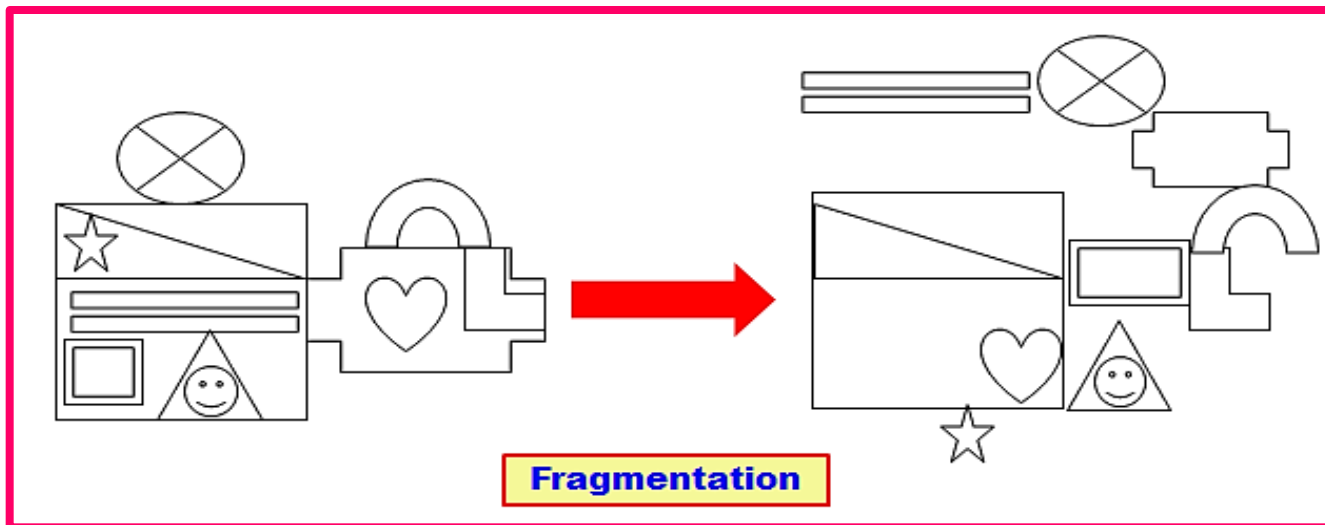
What You Might Notice in the Classroom

Those who speak of gestalt usually group the problem into two categories:

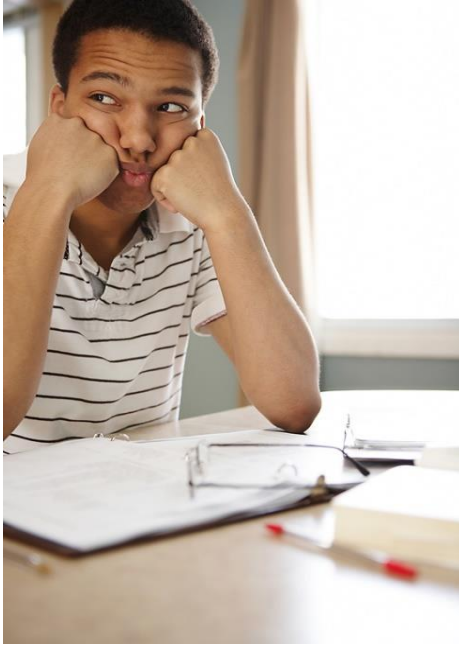
1. **The loss of detail** (Student does copy/see the inner details of the figure or sequence).



2. **The fragmenting of a whole** (Student copies/sees the details but not how they go together).



Obviously the loss of detail or the fragmentation of a whole can be devastating for academics.



As teachers, we assume that if we “show” a child something they are actually seeing what we have shown them. But, as you now understand, that is NOT the case for all children.

We can only imagine how spelling words, simple math equations, worksheets, art projects and other visuals must appear to these students. I am sure the whole world must seem quite confusing, especially when we realize this loss of detail or fragmentation is not standardized----it changes every time they see that same object.

This means a sentence that appears fragmented *may look totally different each time it is viewed*. Almost hard to imagine, isn't it?

Typical Treatment

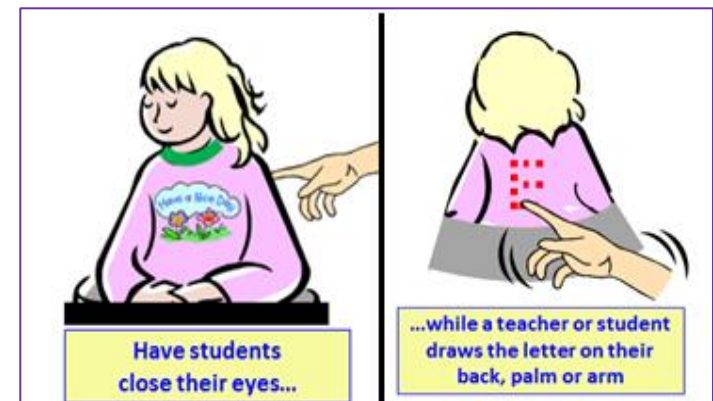
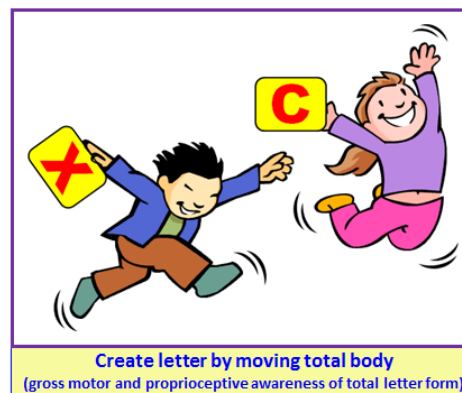
Treatment for gestalt problems is similar to treatment for visual closure and figure ground problems and uses the same activities. Complicating conditions (i.e. strabismus) may also be treated. Emphasis is on noticing detail or understanding the integrity of the object so all pieces can be put in their correct place. Since the visual cues that allow this to happen are not dependable, though, alternative forms of processing or “checking” visual information must be put into place.

For example, the letter B may appear in various orientations or with different formations to a child with this condition. If we place the way B is to be written in **motor memory** (child is able to write it with eyes closed because they know the sequence), then the child can use that motoric memory to check and see if their visual information is correct.

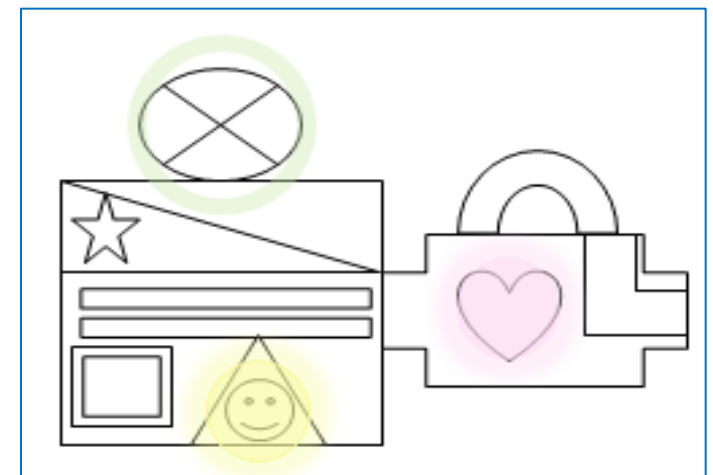
Classroom Activities to Strengthen Visual Teaming

In light of this, any of the visual activities we have mentioned earlier can be useful for these students, but they may require some level of accommodation to assist them in understanding the visual information they are receiving. Here are some additional suggestions that can help the student begin to “check” the visual information they are receiving.

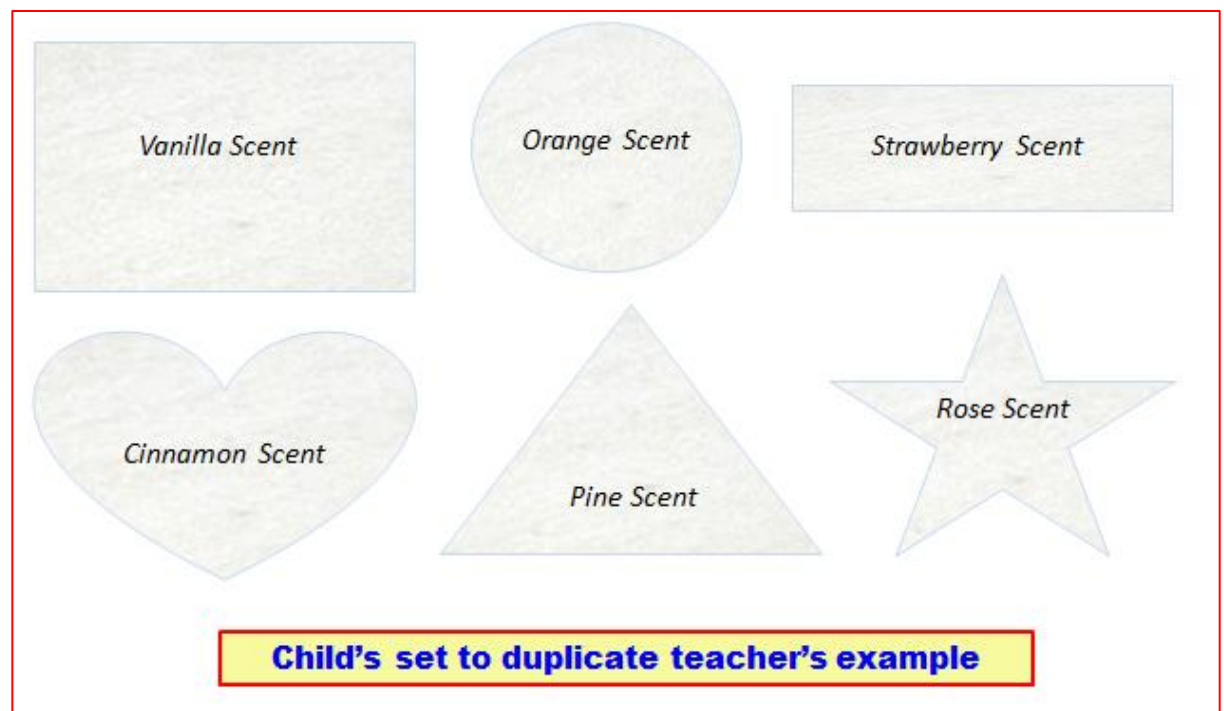
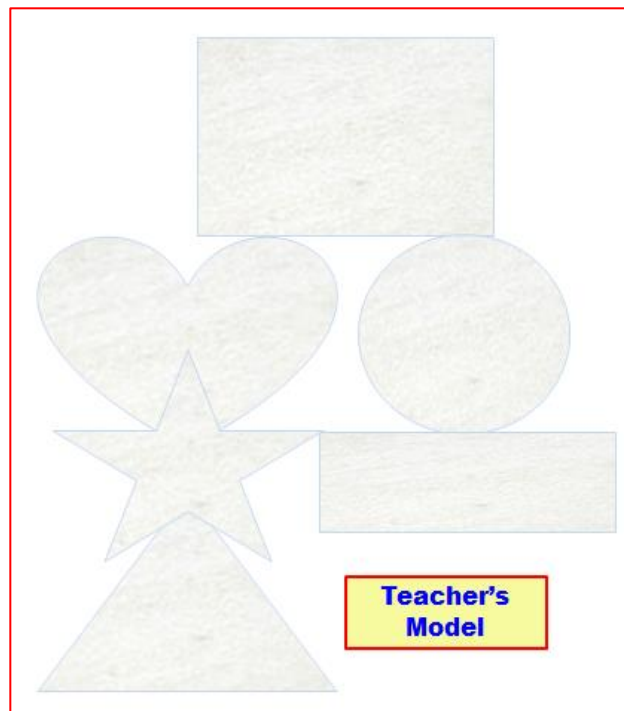
1. Use motor and sensory cues to understand letter direction and other symbols (i.e. writing them in sand, on their back, making them with their body, etc.)



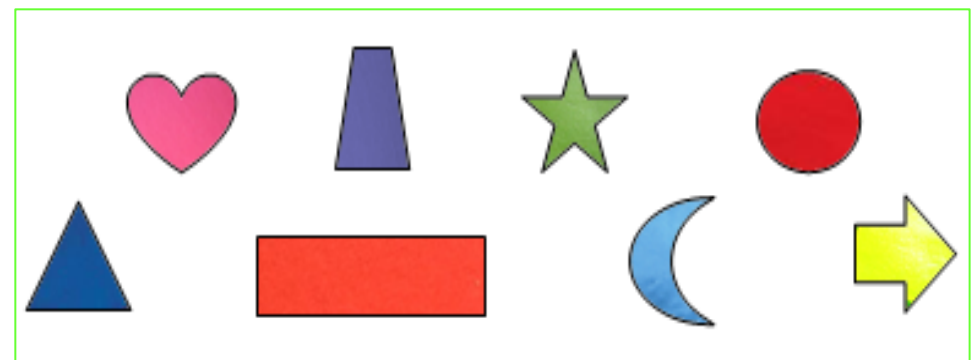
2. Teach them to highlight key details or the outline of objects (depending on gestalt problem) so they can check to see if that piece is in their final product and/or created in the correct manner. You can also teach them to systematically check words, letters and objects by tracing them with their finger and using their motor memory to see if they are correct.



3. Use sensory cues to give the student additional information while they are working on difficult tasks. For example, create shapes that have a sensory cues (i.e. sand, glue, fabric edges...) or olfactory cues (scents like cinnamon, vanilla, etc.). Then create a complex picture using the shapes and have the child duplicate it with their own set. They can then check to see if they are correct by using the non-visual cues (i.e. the vanilla scented one should be on top, etc.).



Adding colored felt shape “details” to this activity can make the task more challenging, especially for students with gestalt problems where inner details are usually ignored...

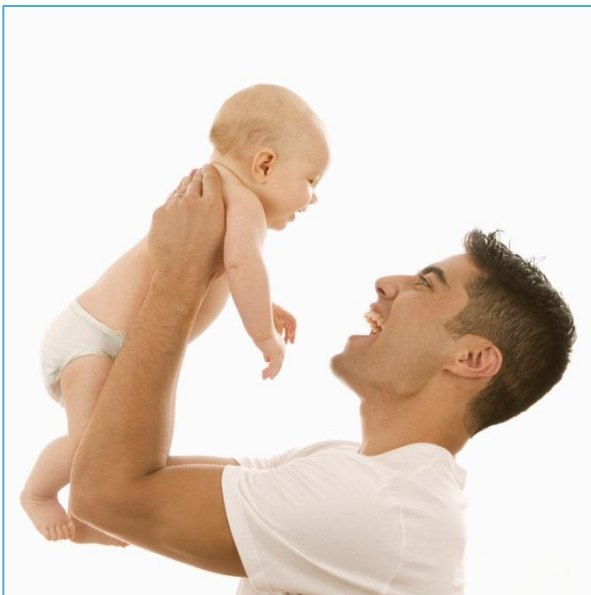


Unique Problems

Prosopagnosia (Face Blindness)

Description

Prosopagnosia or Face Blindness causes a person to be unable to recognize faces to some degree. It was once thought to be a rare condition and due to brain injury. Now, however, it appears that 1 in 50 may have some form of this condition and in many cases it has been inherited.



Face blindness is an unusual condition since so much of our brain is devoted to the recognition of faces. It is one of the first visual stimuli that will hold our attention and is so important that a whole section of the brain is devoted to this skill.

This is why it takes so little for our brains to “see faces” in trunks of trees, on the moon and in other objects. Our eyes from the very beginning are searching for faces 😊

So how can something like face blindness occur? Well, the condition varies widely, but there are patterns that we see. In all cases people with face blindness CAN recognize features (i.e. eyes, noses and mouths), but the actual processing that hooks those features to a recognizable person is lost.



The condition can include any combination of the following:

- ❖ Inability to hold features in memory (NOTE--not all agree that memory is involved in this condition)
- ❖ Inability to link features into a “whole” face (i.e. almost a gestalt-type problem)
- ❖ Inability to recognize faces from other objects, even inanimate ones (rare)
- ❖ Inability to recognize familiar faces only
- ❖ Inability to recognize unknown faces and characteristics (i.e. young or old, female or male, etc.)
- ❖ Inability to recognize any face...including their own (even when looking in a mirror with a crowd)
- ❖ Lack of social skills (...some feel this may be impacting people with Asperger’s and autism)
- ❖ In some severe cases people with face blindness can develop secondary anxiety disorders
- ❖ In some cases the inability to recognize and hold places in memory may also occur as a related issue

What You Might Notice in the Classroom

Clearly students with some level of face blindness will be struggling with social issues as well as many other irritations in their daily life.

Here are some signs to guide you:

1. Does not recognize own picture
2. Do not recognize peers, especially out of context (i.e. outside their classroom)
3. Cannot follow visual storylines (i.e. cannot follow characters and storyline in a video)
4. May lose teacher/class when walking with them in a crowded hall or on field trips
5. May make silly faces in pictures or in mirror so they can recognize themselves
6. May show poor social skills, lack of friends and general anxiety when with people
7. May not be able to recognize team members, especially if they are dressed in the same uniform



Typical Treatment

Since this condition is permanent, the focus is on coping mechanisms that will make social interaction and daily life easier. They include any of the following:

- Learn to use outside characteristics to recognize people (i.e. hair color, cut, voice, etc.) and standardize them as needed (i.e. homeroom teacher always has a yellow watch on, parent wears special shirt when out with them in public, special shirt worn by teacher on field trips, etc.)
- Learn to cope when some of these learned cues change (i.e. haircut causes them to no longer know person)
- Become social and smile at *everyone* so people you know and but do not recognize are not offended
- Develop safety mechanisms so student does not go with wrong parent, class, teacher, etc.
- Use a peer-buddy to assure safety on field trips and other activities outside the confines of the school
- Develop ways to recognize self (i.e. keep an unusually colored shirt at school and have the child wear it anytime photos are being taken....this way they can always recognize themselves in pictures and videos).
- Find an adult family member or mentor who has coped with the condition
- Teach the student to advocate for themselves, ask for help and explain the condition to others

Classroom Activities to Strengthen Coping Skills



Any activity that accomplishes the above list is useful. I have found the last bullet (advocacy) to be especially important. These students will be dealing with this condition their whole life, and in many cases, in their own children someday. They must learn to be vocal about their needs, limitations, and strengths in order to avoid the social crippling that can accompany this condition---especially if care is not taken. Education of others is key, and since most find the condition fascinating, the student is rarely rejected.

Unique Problems

Irlen Syndrome

Description

Irlen Syndrome is a condition that crosses both visual perception and reading disabilities. For a long time, many did not believe it existed---they thought it was a form of Dyslexia (often referred to as Visual Magnocellular Deficit). Now, most feel it is a separate condition in its own right.

So what is **Irlen Syndrome** (often referred to as **Scotopic Sensitivity System--SSS**)? People with Irlen do not process the printed symbols in the same manner as typical readers. Due to unusual sensitivity to contrast and light, students will experience visual perceptual problems including words that shift, turn darker or lighter or even appear to be floating off the page onto other surfaces such as a wall or board.

Many students with Irlen Syndrome will never complain about their eyesight. Since most see other parts of their world in a normal manner, they do not realize that the way there are viewing print is unusual. Please note, though, in rare situations, Irlen can influence all vision. For example, some people will see a haze or a moving series of miniscule dots across their visual field at all times. In other words, Irlen is as varied as the children who have it---and it is the source of some of the most unusual cases I have had!

For example, I had one child years ago who had been retained in both kindergarten and first grade. When I was asked to see him, the school was already discussing retaining him a third time or moving him to a specialized placement. It was clear, though, that the child was quite bright. Upon questioning he told me he COULD read but found it too scary to do often. When questioned further, he revealed he hated it when “the white page with the black letters turned to a black page with white letters”. He had Irlen Syndrome but no one had ever bothered to ask....quite sad!

The dog ran home.



The dog ran home.

What You Might Notice in the Classroom

The following are signs of this syndrome, but since students do not know that what they are seeing is unusual, you may have to question them to determine whether some of the symptoms are present.

- + headaches or fatigue when reading
- + skipping words, sentences or losing place while reading
- + poor comprehension skills and reading test scores
- + problems with some forms of lighting and general light sensitivity
- + problems with clumsiness (often due to depth perception issues)
- + words/sentences that shift, turn, blur/fade, darken/lighten, have a halo, vibrate or move around
- + page surfaces that twinkle, flash, flicker or seem too bright or have too much of a glare to look at
- + will move body or head to focus on written material
- + prefer to work/read in dim light (may always work with eyes partially covered)
- + may rub eyes or close them

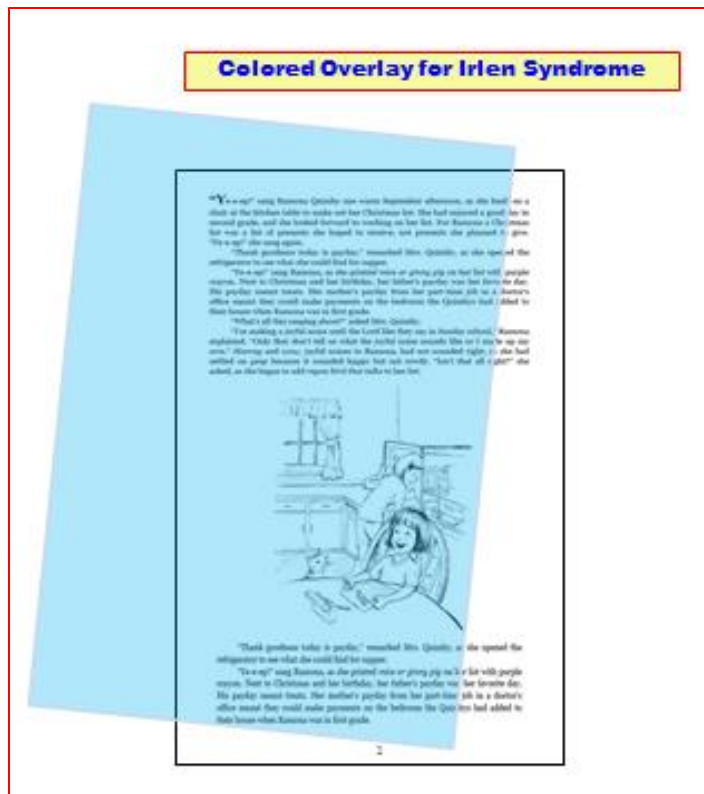
Typical Treatment

The main treatment for this condition is the use of colored glasses and/or colored overlays that reduce the contrast and change the light coming into the eye.

Not all students will respond to the same colors, but the most useful colors appear to be a light yellowish-amber or a light blue. These Irlen Filters can be found in many locations. Here are two stores that carry them: <http://irlen.com/index.php?s=overlays> and <http://www.crossboweducation.com/index.php?route=product/search&search=irlen%20filters>. I have also used colored transparencies (much cheaper) successfully. Just make sure you use a particular brand since the color shades vary greatly across companies...



Classroom Activities to Strengthen Visual Teaming



For example, look at the difference contrast makes in the example to the right. Sometimes the smallest change can make a world of difference.

Now that so many computers allow you to adjust background color, the change only takes seconds and rarely affects or is even noticed by the other children in the classroom!

Assisting students with Irlen Syndrome usually involves the use of colored glasses or overlays. As long as the correct overlay is used, the student often will not have additional difficulty.

It may also be important to become more aware of visual contrast when using computers, whiteboards and other electronic projection systems.

Visual Contrast Sensitivity

This may be too hard to read

This may be easier to read

- *Adjust *Font* on Computer
- *Reduce **Color** on Display
- *Change Fonts to **Comic Sans**

Resources

Please note that some of the best supports will be found in your own community or school district. Occupational Therapists can be an especially wonderful source of information. Meanwhile, I have provided some general links to get you started, but a simple search for your student's particular condition and needs will usually prove to be more useful.

<http://www.ncld.org/> (National Center for Learning Disabilities; provides resources on many other disabilities as well)

<http://www.ldonline.org/article/6390/>
(Learning Disabilities Online; provides resources on many other disabilities as well)

<http://children.webmd.com/video/vision-therapy-children> (video on vision therapy)

<http://grantvisioncare.com/vision-therapy/> and <http://www.optometrists.org/sorkin/index.html> (resources vision therapy)

<http://irlen.com> and <http://www.hale.ndo.co.uk/scotopic> (simulations of Irlen Syndrome)

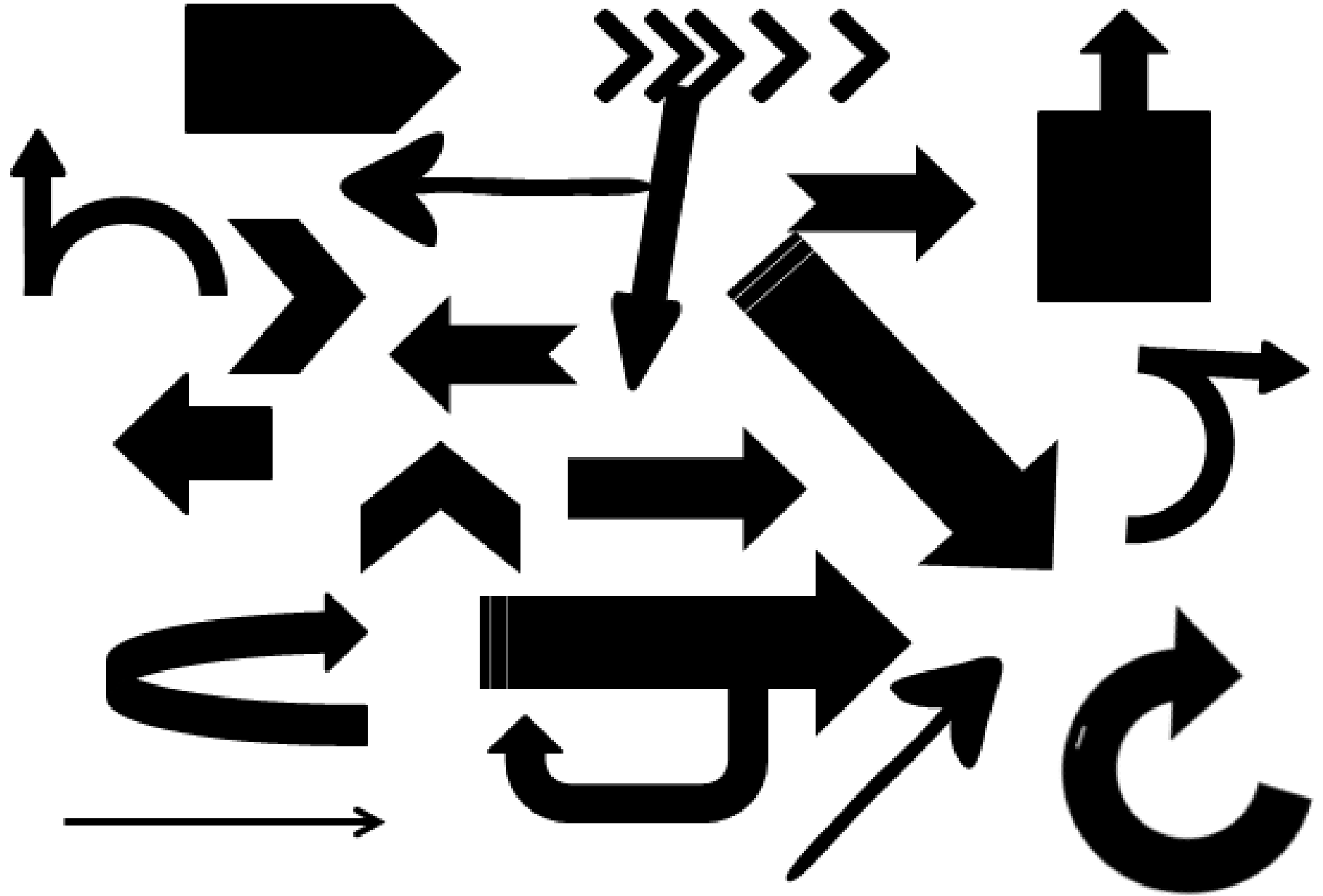
<http://www.vision3d.com/frame.html> and <http://www.eyecanlearn.com/> (online info and exercises for the eyes)

If for some reason a link is broken (they change SO often) just go back to the primary organization the link came from and search from there. That will usually help you find where they moved the information or take you to something similar!



How many flowers do you see? _____

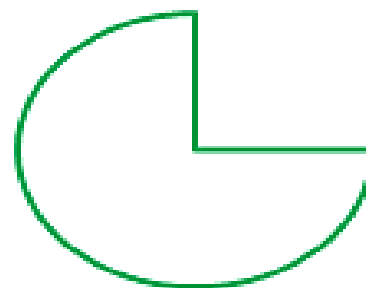
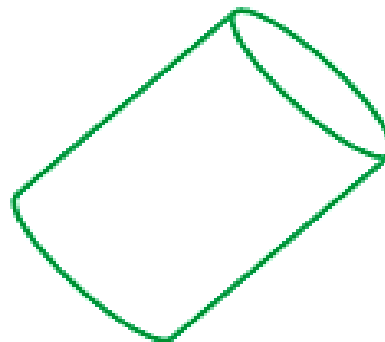
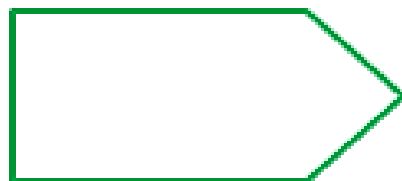
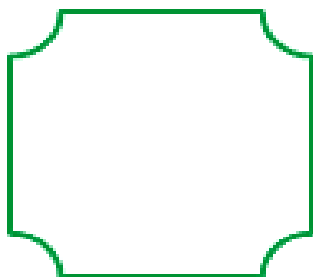
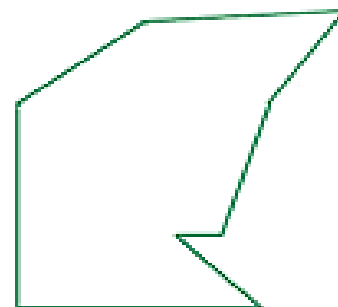
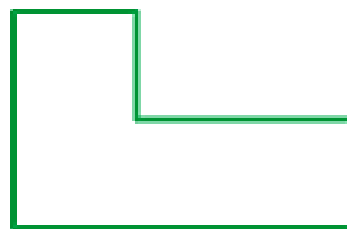
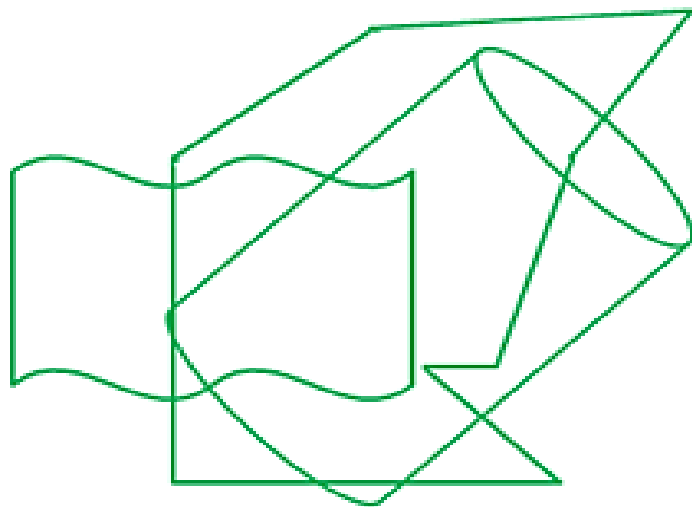




d d d p
q d b q p
p d p d b b
d b b q b q
b p d d p b q
b p q q

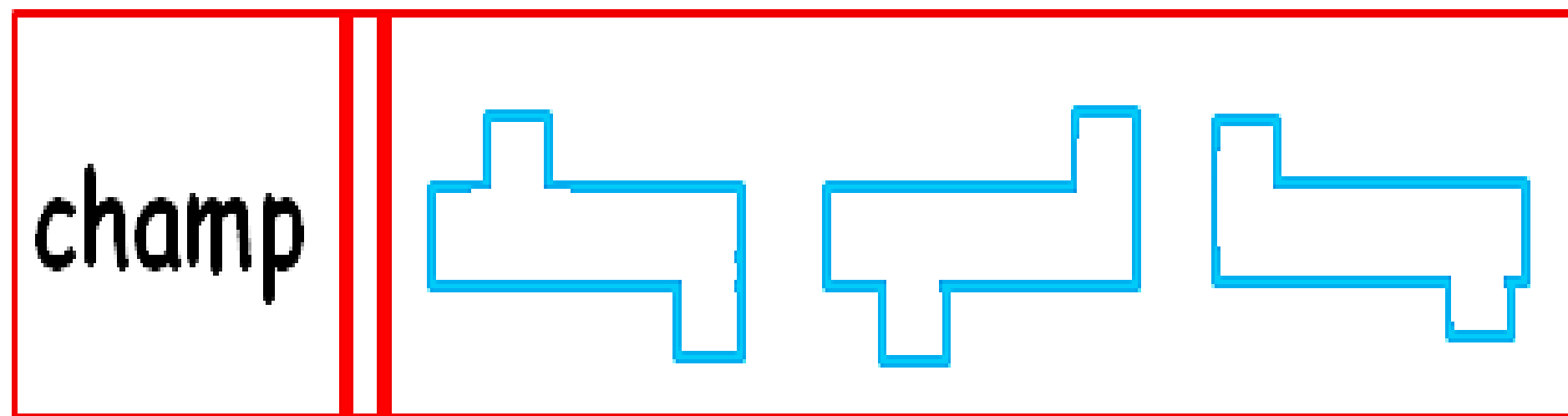
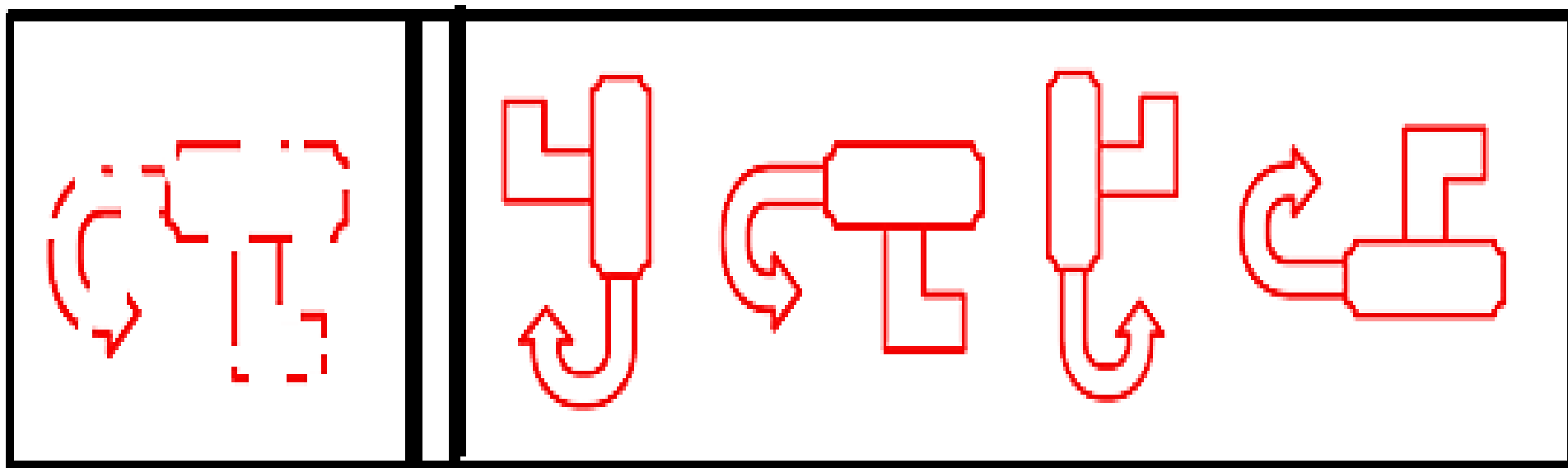


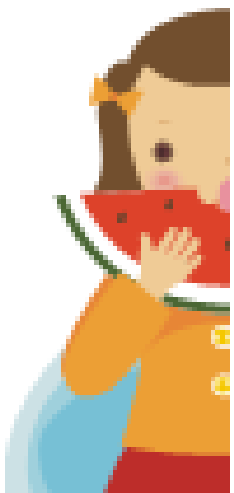




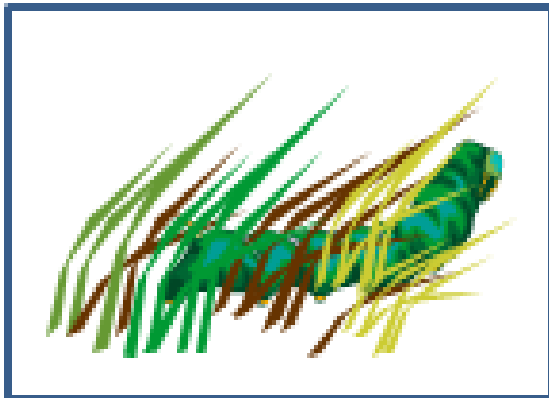
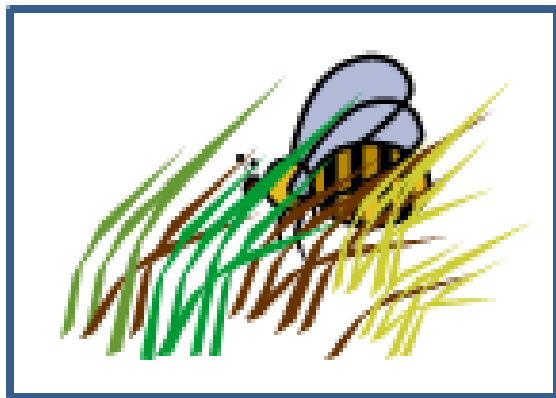
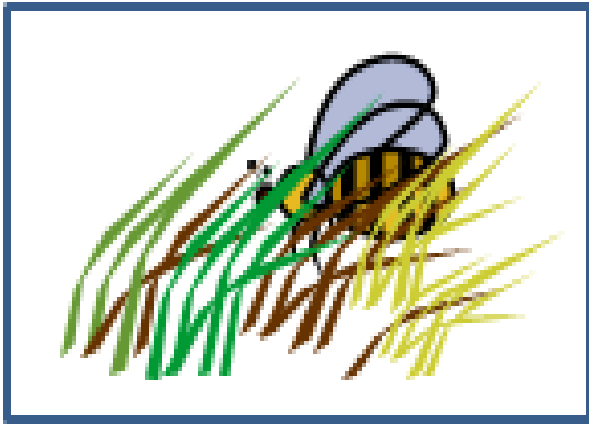
How many houses look the same as this boy's house? _____

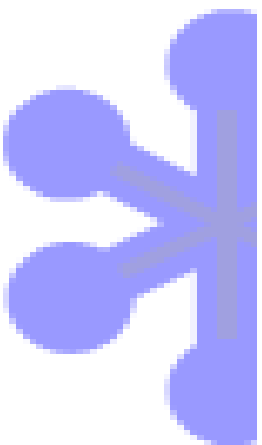


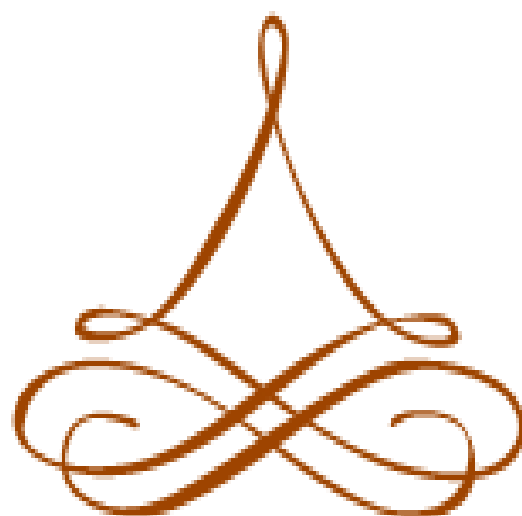




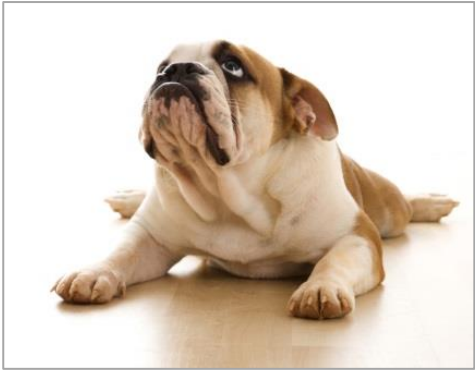














How many...

1 _____ 2 _____ 3 _____