Upside~Down Brilliance:
The Visual~Spatial Learner

Linda Kreger Silverman, Ph.D.
Licensed Psychologist

Maria J. Krabbe Foundation for Visual Thinking

Driebergen, The Netherlands

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The Institute for the Study of Advanced Development
Gifted Development Center/Visual-Spatial Resource
1452 Marion Street
Denver, Colorado 80218
www.gifteddevelopment.com; www.visual-spatial.org
303-837-8378; 303-837-8704

Are You a Visual-Spatial Learner?

about your learning style.

		Yes	No
1.	Do you think mainly in pictures instead of in words?		
2.	Do you know things without being able to explain how or why?		
3.	Do you solve problems in unusual ways?		
4.	Do you have a vivid imagination?		
5.	Do you remember what you see and forget what you hear?		
6.	Are you terrible at spelling?		
7.	Can you visualize objects from different perspectives?		
8.	Are you organizationally impaired?		
9.	Do you often lose track of time?		
10	Would you rather read a map than follow verbal directions?		
11.	Do you remember how to get to places you visited only once?		
12	Is your handwriting difficult for others to read?		
13	Can you feel what others are feeling?		
14	Are you musically, artistically, or mechanically inclined?		
15	Do you know more than others think you know?		
16	Do you hate speaking in front of a group?		
17	Did you feel smarter as you got older?		
18.	Are you addicted to your computer?		

If you answered *yes* to 10 of the above questions, you are very likely to be a visual-spatial learner.

From Silverman, L.K. (2002). *Upside-Down Brilliance: The Visual-Spatial Learner.* Denver: DeLeon Publishing.

Visual-Spatial Learner

Characteristics Comparison

The Auditory-Sequential Learner	The Visual-Spatial Learner
Thinks primarily in words	Thinks primarily in images
Has auditory strengths	Has visual strengths
Relates well to time	Relates well to space
Is a step-by-step learner	Is a whole-part learner
Learns by trial and error	Learns concepts all at once
Progresses sequentially from easy to difficult material	Learns complex concepts easily; struggles with easy skills
Is an analytical thinker	Is a good synthesizer
Attends well to details	Sees the big picture; may miss details
Follows oral directions well	Reads maps well
Does well at arithmetic	Is better at math reasoning than computation
Learns phonics easily	Learns whole words easily
Can sound out spelling words	Must visualize words to spell them
Can write quickly and neatly	Much better at keyboarding than handwriting
Is well organized	Creates unique methods of organization
Can show steps of work easily	Arrives at correct solutions intuitively
Excels at rote memorization	Learns best by seeing relationships
Has good auditory short-term memory	Has good long-term visual memory
May need some repetition to reinforce learning	Learns concepts permanently; does not learn by drill and repetition
Learns well from instructions	Develops own methods of problem solving
Learns in spite of emotional reactions	Is very sensitive to teachers' attitudes
Is comfortable with one right answer	Generates unusual solutions to problems
Develops fairly evenly	Develops quite asynchronously (unevenly)
Usually maintains high grades	May have very uneven grades
Enjoys algebra and chemistry	Enjoys geometry and physics
Masters other languages in classes	Masters other languages through immersion
Is academically talented	Is creatively, mechanically, technologically, emotionally or spiritually gifted
Is an early bloomer	Is a late bloomer

The Visual-Spatial Learner: An Introduction

Linda Kreger Silverman. Ph.D.

Many teachers try very hard to accommodate the various learning styles of their students, but this can be an overwhelming task, as some of the learning styles inventories and models are quite complicated. As a former classroom teacher myself, I know that there are a limited number of hours in the day, and even the most dedicated teacher cannot plan for all the different learning styles and intelligences of his or her students. Take heart! There's an easier solution.

The visual-spatial learner model is based on the newest discoveries in brain research about the different functions of the hemispheres. The left hemisphere is sequential, analytical, and time-oriented. The right hemisphere perceives the whole, synthesizes, and apprehends movement in space. We only have two hemispheres, and we are doing an excellent job teaching one of them. We need only become more aware of how to reach the other, and we will have happier students, learning more effectively.

I'd like to share with you how the visual-spatial learner idea originated. Around 1980, I began to notice that some highly gifted children took the top off the IQ test with their phenomenal abilities to solve items presented to them visually or items requiring excellent abilities to visualize. These children were also adept at spatial tasks, such as orientation problems. Soon I discovered that not only were the highest scorers outperforming others on the visual-spatial tasks, but so were the ***lowest*** scorers. The main difference between the two groups was that highly gifted children also excelled at the auditory-sequential items, whereas children who were brighter than their IQ scores had marked auditory and sequential weaknesses. It was from these clinical observations and my attempt to understand both the strengths and weaknesses that the concept of the "visual-spatial learner" was born.

Visual-spatial learners are individuals who think in pictures rather than in words. They have a different brain organization than auditory-sequential learners. They learn better visually than auditorally. They learn all-at-once, and when the light bulb goes on, the learning is permanent. They do not learn from repetition and drill. They are whole-part learners who need to see the big picture first before they learn the details. They are non-sequential, which means that they do not learn in the step-by-step manner in which most teachers teach. They arrive at correct solutions without taking steps, so "show your work" may be impossible for them. They may have difficulty with easy tasks, but show amazing ability with difficult, complex tasks. They are systems thinkers who can orchestrate large amounts of information from different domains, but they often miss the details. They tend to be organizationally impaired and unconscious about time. They are often gifted creatively, technologically, mathematically or emotionally.

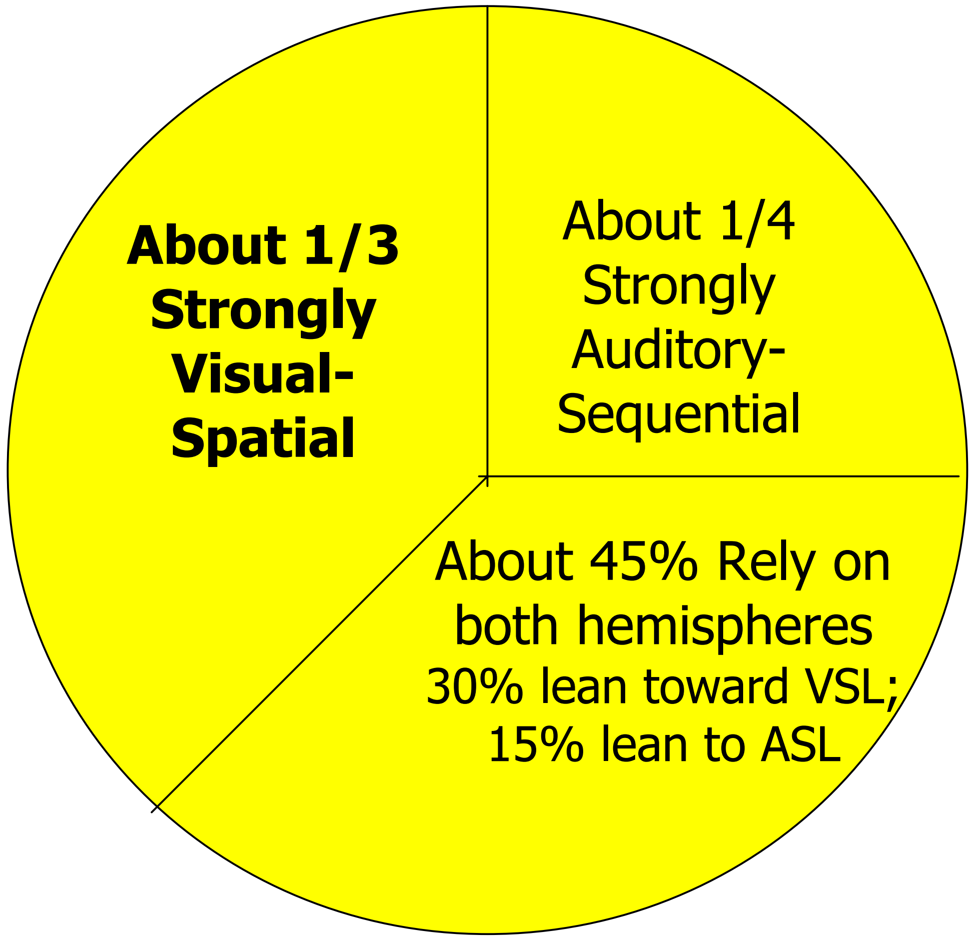
Parents can tell if they have one of these children by the endless amount of time they spend doing advanced puzzles, constructing with LEGOs, etc., completing mazes, counting everything, playing Tetris on the computer, playing chess, building with any materials at hand, designing scientific experiments, programming your computer, or taking everything in the house apart to see how it operates. They also are very creative, dramatic, artistic and musical.

At the Gifted Development Center, we have been exploring the visual-spatial learner phenomenon for over 2 decades. We have developed strategies for working effectively with these children, guidance for parents on living with visual-spatial learners, and techniques to help visual-spatial students learn successfully through their strengths. This information is now available in ***Upside-Down Brilliance: The Visual-Spatial Learner*** (Denver: DeLeon Publishing, 2002); ***Raising Topsy-Turvy Kids: Successfully Parenting Your Visual-Spatial Child*** (Denver: DeLeon Publishing, 2004); ***If You Could See the Way I Think: A Handbook for Visual-Spatial Kids*** (Denver: Visual-Spatial Resource, 2005); and ***Gifted Education Communicator***, Spring, 2003, Volume 34, Number 1 (Whittier, CA: California Association for the Gifted).

Over a period of nine years, a multi-disciplinary team created the ***Visual-Spatial Identifier***—a simple, 15-item checklist to help parents and teachers find these children. There are two forms of the *Identifier*: a self-rating questionnaire and an observer form, which is completed by parents or teachers. The ***Visual-Spatial Identifier*** has been translated into Spanish. With the help of two grants from the Morris S. Smith Foundation, the two instruments have been validated on 750 fourth, fifth and sixth graders. In this research, **one-third** of the school population emerged as strongly visual-spatial. An additional 30% showed a slight preference for the visual-spatial learning style. Only 23% were strongly auditory-sequential. This suggests that a substantial percentage of the school population would learn better using visual-spatial methods.

Please visit our websites, www.visualspatial.org and www.gifteddevelopment.com, for more information about visual-spatial learners. Or call the Gifted Development Center (1-888-GIFTED1) or Visual-Spatial Resource (1-888-VSR-3744) to order a copy of ***Upside-Down Brilliance***, ***Raising Topsy-Turvy Kids, If You Could See the Way I Think***, ***Gifted Education Communicator***, or the ***Visual-Spatial Identifier***, or articles about visual-spatial learners. The Visual-Spatial Resource Access Team also offers presentations for groups and phone consultations for parents.

Research from the Gifted Development Center concludes:



The study included 750 4th, 5th and 6th graders, white and Hispanic, from urban and rural schools, all socio-economic backgrounds and all IQ ranges.

The Visual-Spatial Identifier
Self-Report

1. I hate speaking in front of a group.
2. I think mainly in pictures instead of words.
3. I am good at spelling (not).
4. I often lose track of time.
5. I know more than others think I know.
6. I don't do well with tests with time limits.
7. I have neat handwriting (not).
8. I have a wild imagination.
9. I like to take things apart to find out how they work.
10. I hate writing assignments.
11. I solve problems in unusual ways.
12. It's much easier for me to tell you about things than to write them down.
13. I have a hard time explaining how I came up with my answers.
14. I am well organized (not).
15. It was easy for me to memorize my math facts (not).

Why All Students Need Visual-Spatial Methods

Linda Kreger Silverman, Ph.D.

The first child I observed with unusual visual-spatial abilities was profoundly gifted (above 175 IQ). So I assumed that visual-spatial learners were profoundly gifted. Then, I discovered that children who fit the characteristics of giftedness, but did not test in the gifted range due to hidden learning disabilities, were usually visual-spatial learners. So I thought that visual-spatial learners were either profoundly gifted or twice exceptional (gifted with learning disabilities).

In 1991, I was asked to create a video on visual-spatial learners for the state of Missouri; the Director of Curriculum was convinced that the information would be applicable in all subject areas and at all grade levels, from Kindergarten through 12th grade. I was uncertain at the time, but he turned out to be right.

When we developed *the Visual-Spatial Identifier*, a process that began in 1992 and took the better part of a decade, we still thought that a small percentage of the population would turn out to be visual-spatial learners. The results of the second validation study of our *Identifier*, in 2001, astounded us! Approximately one-third of the 750 students we had assessed in two schools were **strongly** visual-spatial and another 30% were moderately visual-spatial. That represented the majority of the school population!

As I was completing *Upside-Down Brilliance: The Visual-Spatial Learner*, published at the end of 2002, I realized more clearly what Dr. Jerre Levy had said: "Unless the right hemisphere is activated and engaged, attention is low and learning is poor." She was talking about every student in the classroom.

Throughout the book I hinted that the visual-spatial learner might soon have the edge in gaining employment. Tom West (1991), author of *In the Mind's Eye*, suggests that in the 21st century employees will require strong visual skills: "ready recognition of larger patterns, intuition, a sense of proportion, imaginative vision, the original and unexpected approach, and the apt connection between apparently unrelated things" (p. 88).

Daniel H. Pink (2005), author of *A Whole New Mind: Moving from the Information Age to the Conceptual Age*, proposes that, now that information is readily available on the Internet, success in today's world is dependent on empathy, intuition, spirituality and right hemispheric-directed abilities.

> "In the United States, the number of graphic designers has increased tenfold in a decade; graphic designers outnumber chemical engineers by four to one. Since 1970, the United States has 30% more people earning a living as writers and 50% more earning a living by composing or performing music. … More Americans today work in arts, entertainment and design than work as lawyers, accountants and auditors." (p. 55)

I began thinking about how schools are preparing students for success in their careers. It is very likely that until the modern age the skills emphasized in school were necessary for achievement in adult life. However, the world is changing very quickly and our educational systems are not keeping pace. Success in school still depends upon:

- Following directions
- Turning in assigned work on time
- Memorization of facts
- Fast recall
- Showing steps of work
- Neat, legible handwriting
- Accurate spelling
- Punctuality
- Good organization; tidiness

What positions require the skills so heavily prized in school? These auditory-sequential skills are actually limiting the potential of all students to gain employment in today's world. Citizens of the 21st century are rewarded beyond school for:

- Ability to predict trends
- Grasping the big picture
- Thinking outside the box
- Risk-taking
- Problem-finding and problem-solving skills
- Combining one's strengths with others' to build a strong team
- Computer literacy
- Dealing with complexity
- Ability to read people well

Isn't it time we recognize the importance of right-hemispheric abilities and provide ***all*** students the opportunity to develop their visual-spatial skills? These skills are essential to their success in adult life. To continue to prepare students for jobs in the 1950s is limiting their potential instead of enhancing it. One of the central functions of school has always been to prepare the citizenry for gainful employment.

Are we missing the mark?

Prepared for the Visual-Spatial Resource website: www.visualspatial.org

EFFECTIVE TECHNIQUES FOR TEACHING VISUAL-SPATIAL LEARNERS

Linda Kreger Silverman, Ph.D.

Spatial and sequential dominance are two different mental organizations that affect perceptions and apparently lead to different world views. Information deemed central to one viewpoint appears irrelevant from the other perspective. The sequential system appears to be profoundly influenced by audition, whereas the spatial system relies heavily on vision and visualization. Auditory-sequential learners are extremely aware of time but may be less aware of space; visual-spatial learners are often preoccupied with space at the expense of time. Sequential learning involves analysis, orderly progression of knowledge from simple to complex, skillful categorization and organization of information, and linear, deductive reasoning. Spatial learning involves synthesis, intuitive grasp of complex systems (skipping many of the foundational "steps"), simultaneous processing of concepts, inductive reasoning, active use of imagery, and idea generation by combining disparate elements in new ways. These diverse ways of relating to the world have had powerful ramifications throughout history in the development of various philosophies, religions, cultures, branches of science, and psychological theories.

Western and Eastern philosophies and cultures provide dramatic examples of these differences. Western thought is sequential, temporal, analytic; Eastern thought is spatial and holistic (Bolen, 1979). Cause and effect sequences are stressed in Euro-American ideation, whereas synchronicity of unrelated events is appreciated from an Asian world view. Western languages are constructed out of non-meaningful elements--letters of the alphabet; Eastern languages traditionally have been composed of pictorial representations. Perhaps the greater facility of Asian children in the visual-spatial domain can be traced at least in part to the emphasis on visualization in the linguistic system.

Temporal, sequential and analytical functions are thought to be left-hemispheric strengths, while spatial, holistic and synthetic functions are considered right-hemispheric strengths (Dixon, 1983; Gazzaniga, 1992; Springer & Deutsch, 1989; West, 1991). However, most researchers agree that integration of both hemispheres is necessary for higher-level thought processes. We all use both hemispheres, but not with equal facility. Highly gifted individuals show strong integration of sequential and spatial functions, but most of the gifted children we have assessed seem naturally to favor one or the other mode.

These different mental organizations appear to be innate. Although one can gain more facility with one or the other mode through learning, it is unlikely that a person with sequential dominance can learn to perceive the world in exactly the same way as an individual with spatial dominance or vice versa. Instead of trying to remake one or the other style of learning, we need to accept these inherent differences in perception, and appreciate their complementarity since we inhabit a spatial-temporal reality. When these differences are not understood, there is dissension; when they are honored, they enable an exchange of information that forms a more complete conception of reality than can be gained by either perspective in isolation.

Characteristics

Individuals who exhibit stronger visual-spatial abilities than auditory sequential abilities are considered visual-spatial learners. They do extraordinarily well on tasks with spatial components: solving puzzles, tracing mazes, duplicating block designs, counting three-dimensional arrays of blocks, visual transformations, mental rotations, envisioning how a folded and cut piece of paper would appear opened up, and similar items. The Block Design subtest of the *Wechsler Intelligence Scale for Children* (WISC) is one of the strongest indicators of the visual-spatial learning style. The Abstract Visual Reasoning section of the *Stanford-Binet Fourth Edition* and the Raven's *Progressive Matrices* also assess spatial abilities. The *Mental Rotations Test* has been used in several studies to detect children with extremely strong visual-spatial and mathematical talents.

Visual-spatial learners perceive the interrelatedness of the parts of any situation. Their learning is holistic and occurs in an all-or-none fashion. They are most likely to experience the "Aha!" phenomenon, when all of a sudden they "see it." Many have a photographic visual memory: they can visually recall anywhere they have ever been and how to get there. This type of learning does not take place through a series of steps. Sequential skills are usually reserved as a back-up system when they cannot grasp a concept through their preferred mode of apprehending the entire gestalt. They may create visual models of reality that are multi-dimensional.

As toddlers, these children like to see how things work, and they enjoy pulling things apart to see if they can reconstruct them. When given an ordinary toy, they will play with it long enough to figure out how it works, and most likely never touch it again. They enjoy novelty and challenge. Visualization is a key element in the mental processing of visual-spatial learners. If they are introverted, they will rehearse everything mentally before they attempt it: walking, talking, reading, riding a bicycle, etc. These children are usually fascinated with puzzles and mazes, and have expert facility with them. They will spend endless hours building with construction toys (blocks, lego sets, tinker toys) or other materials, and their constructions are often quite sophisticated and intricate in design. Given the opportunity, these children often begin quite young to have a lifelong love affair with numbers and numerical relations.

Spatial abilities underlie both mathematical talent and creativity, and are essential in a number of fields: mathematics, science, computer science, technological fields, architecture, mechanics, aeronautics, engineering, and most creative endeavors (visual arts, music, etc.). Unfortunately, visual-spatial learners may dislike school because of the overemphasis on lecturing, rote memorization, drill and practice exercises, and the lack of sufficient stimulation of their powerful abstract visual reasoning abilities. Lectures are more appropriate for auditory sequential learners unless visual aids are used. Rote memorization and drill are effective strategies for concrete auditory sequential learners, but they are counterproductive to the learning style of visual-spatial learners. Learning, for visual-spatial learners, takes place all at once, with large chunks of information grasped in intuitive leaps, rather than in the gradual accretion of isolated facts, small steps or habit patterns gained through practice. For example, they can learn all of the multiplication facts as a related set in a chart much easier and faster than memorizing each fact independently.

Once learning takes place, it creates a **permanent** change in the child's awareness and understanding. In this case, practice does not make perfect; it is completely unnecessary for the student's learning style and it deadens the child's natural interest in a subject. When a student with powerful abstract reasoning abilities is asked to use only the simplest mental facility of rote memorization, much of the potency of the child's intelligence remains unused. When the gifted child is given more stimulating, advanced, complex material to learn, and the material is presented at a faster pace, then the child's natural gift of abstract reasoning is exercised and developed. Gifted spatial learners thrive on abstract concepts, complex ideas, inductive learning strategies, multidisciplinary studies, holistic methods, and activities requiring synthesis; they are natural pattern finders and problem solvers. When educated according to their learning style, they are capable of original, creative thought.

Strategies for Instruction

The following strategies have been found to be effective in teaching children with visual-spatial strengths:

1) Use visual aids, such as overhead projectors, and visual imagery in lectures.
2) Use manipulative materials to allow hands-on experience.
3) Use a sight approach to reading rather than phonics.
4) Use a visualization approach to spelling: show the word; have them close their eyes and visualize it; then have them spell it *backwards* (this demonstrates visualization); then spell it forwards; then write it once.
5) Have them discover their own methods of problem solving (e.g., instead of teaching division step-by-step, give them a simple division problem, with a divisor, dividend and quotient. Have them figure out how to get that answer in their own way. When they succeed, give them a harder problem with the solution already worked out and see if their system works).
6) Avoid rote memorization. Use more conceptual or inductive approaches.
7) Avoid drill and repetition. Instead, have them perform the hardest tasks in the unit.
8) Find out what they have already mastered before teaching them.
9) Give them advanced, abstract, complex material at a faster pace.
10) Allow them to accelerate in school.
11) Emphasize mastery of higher level concepts rather than perfection of simpler concepts in competition with other students.
12) Emphasize creativity, imagination, new insights, new approaches rather than acquisition of knowledge. Creativity should be encouraged in all subject areas.
13) Group gifted visual-spatial learners together for instruction.
14) Engage students in independent studies or group projects which involve problem-finding as well as problem-solving.
15) Allow them to construct, draw, or otherwise create visual representations of concepts.
16) Use computers so that material is presented visually.
17) Have the students discuss the ethical, moral and global implications of their learning and involve them in service-oriented projects.

Visual-spatial learners are more attentive if they understand the goals of instruction. They are more cooperative at home and at school if they are allowed some input into decision-making process and some legitimate choices. Discipline must be private, as these children are highly sensitive and easily humiliated. If they are respected, they will learn to treat others with respect. When they are placed in the right learning environment, where there is a good match between their learning style and the way they are taught, visual-spatial learners can actualize their potential to become innovative leaders.

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Note: For more information, please see Silverman, L. K. The visual-spatial learner. *Preventing School Failure, 34*(1), 15-20.

Bio: Linda Kreger Silverman, Ph.D., is a licensed psychologist and Director of the Institute for the Study of Advanced Development and its subsidiary, The Gifted Development Center, in Denver, Colorado. Founder of the journal, *Advanced Development*, she has also edited the popular textbook, *Counseling the Gifted and Talented* (Love, 1993). For nine years she served on the faculty of the University of Denver in gifted education and counseling psychology. Her popular book, *Upside-Down Brilliance: The Visual-Spatial Learner* presents a comprehensive description of this phenomenon (Denver: DeLeon, 2002).

Teaching Mathematics to Non-Sequential Learners

Linda Kreger Silverman, Ph.D.
Gifted Development Center

In our case files, we have dozens of students who show superior grasp of mathematical relations, but inferior abilities in mathematical computation. These students consistently see themselves as poor in mathematics and most hate math. This situation is terribly unfortunate, since their visual-spatial abilities and talent in mathematical analysis would indicate that they are "born mathematicians."

Visual-spatial abilities are the domain of the right hemisphere; sequential abilities are in the domain of the left hemisphere. The test performance patterns demonstrated by this group of students seem to indicate unusual strengths in the right-hemispheric tasks, and less facility with left-hemispheric tasks. In order to teach them, it is necessary to access their right hemispheres. This can be done through humor, use of meaningful material, discovery learning, whole/part learning, rhythm, music, high levels of challenge, emotion, interest, hands-on experiences, fantasy and visual presentations.

Sequentially-impaired students cannot learn through rote memorization, particularly series of numbers, such as math facts. Since the right hemisphere cannot process series of non-meaningful symbols, it appears that these spatially-oriented students must picture things in their minds before they can reproduce them. For example, in taking timed tests, they first have to see the numbers before they can do the computation. This material apparently gets transmitted to the left hemisphere so that the student can respond. This takes twice as long for them as it does for students who do not have impaired sequential functioning; therefore, such tests appear cruelly unfair to them.

I have found that students can learn their multiplication facts in less than two weeks if they are taught within the context of the entire number system. I have them complete a blank multiplication chart as fast as they can, finding as many shortcuts as possible. That may take some assistance, but it enables them to see the whole picture first, before we break it down into parts. I ask them to look for shortcuts to enhance their ability to see patterns. After it is completed, we look mournfully at the table and bemoan the fact that there are over 100 multiplication facts to memorize. Then I ask how we cut down the number of items to learn.

First, we eliminate the rows of zeros, since anything times 0 equals 0. Then we eliminate the rows of 1s, since anything times 1 equals itself. Then, we do the tens and the student happily announces that these are easy, since you just put a zero after the multiplier. By this time, the student usually notices that there are three rows of zeros, ones, and tens, and that one half of the chart is a mirror image of the other half. When we fold it on the diagonal, from the top left corner to the bottom right corner, that becomes even clearer. I ask how this happens and the student discovers the commutative principle: that a x b = b x a. This certainly cuts down on the task of memorization considerably! If one knows 4 x 6 = 24, one also knows that 6 x 4 = 24.

Many visual-spatial students can skip count by their 5s, because 0, 5, 0, 5 is rhythmic and an easy pattern to see. Then I ask them to count by 2s. If they count by 2, they can multiply by 2.

Next, I teach one of several shortcuts for multiplying by 9s. The easiest one I know is to subtract one from the number of nines being multiplied, then find a number which, when added to the first number, results in the sum of nine. For example, in 8 x 9, the following process would occur: subtract 1 from 8, leaving 7. What plus 7 equals 9? (2). The answer is 72, since 7 is one less than 8, and 7 plus 2 add up to 9.

There are other tricks for memorizing the 9s times tables, including the finger method found in *Upside-Down Brilliance: The Visual-Spatial Learner* (page 304). Visual-spatial students are excellent at seeing patterns and there are patterns galore in the 9s column. For example, every answer has a mirror image. Also, as the tens column increases by one digit, the ones column decreases by one digit:

09
18
27
36
45
54
63
72
81
90

Note that 09 at the top is the mirror image of 90 at the bottom, and so forth. The tens column is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, while the ones column is 9, 8, 7, 6, 5, 4, 3, 2, 1, 0.

There are several other tricks. They can remember that you have to be 16 do drive a 4 x 4 (4 x 4 = 16)! Also, 1, 2, 3, 4 is 12 = 3 x 4 and 5, 6, 7, 8 is 56 = 7 x 8. Rhyming equations are easy to recall: 6 x 4 = 24, 6 x 6 = 36, 6 x 8 = 48. Another benefit to these tricks is that students learn division at the same time. If you have a picture of being 16 to drive a 4 x 4, you can simultaneously see that 16 divided by 4 equals 4. I try to teach them all of the doubles at one time, from 2 x 2 to 9 x 9. Doubles seem to be easier than some of the others, since they have a natural rhythm.

Young children like to play games where they count by 3s. There is also a video from Schoolhouse Rock called *Multiplication Rock*, that has catchy tunes for memorizing math facts, particularly the 3s. Also, the 3's can be learned to the tune of *Jingle Bells: "3, 6, 9 – 12, 15 – 18, 21 – 24, 27 – 30 and you're done!"* Sixes can be taught as doubles of threes. These tricks reduce the number of difficult math facts to less than ten.

I ask students to make up a real problem for each of the remaining math facts with which they have difficulty. I ask them to draw a picture (not use stickers) for each problem. The picture needs to include something they are emotionally attached to, such as a favorite animal or food. For example, if they love ice cream, and they are trying to learn 3 x 7, I ask them to draw 7 ice cream cones, each with 3 scoops of ice cream. They write, "3 x 7" at the top of their picture and "7 x 3" at the bottom and then count up all the scoops to arrive at the answer. For 4 x 6, they might draw 6 horses and give each of their horses 4 carrots. They put these pictures up on the wall in their bedroom until they've created a permanent mental image.

These methods bring the facts to life, enabling students to visualize them and create meaningful associations for them. Manipulatives and calculators should also be encouraged. Students should be informed that mathematics is more than calculation. Those who have difficulty with multiplication may be brilliant at geometry, which is non-sequential. Algebra and chemistry are highly sequential, but geometry and physics are spatial. Students with right-hemispheric strengths should be introduced to geometric and scientific principles at the same time that they are struggling with calculation so that they do not come to see themselves as mathematically incapable. In a world of calculators and computers, the computational wizard is all-but-obsolete.

Division is often quite difficult for these students, since it is usually in a step-by-step fashion and these students are lost after the second step. They are not step-by-step learners. They would learn much more rapidly if they were simply given a divisor, a dividend and a quotient and asked to figure out their own method of arriving at the quotient. *Don't ask them to show their steps.* Just give them another problem with the solution already worked out and see if their system works. Gradually increase the level of the problems to test their system. This way of teaching is a lot like the methods used in video games. Even in adult life, these individuals will do beautifully if they know the goal of an activity, and are allowed the freedom to find their own methods of getting there.

Timed tests should be avoided, since it takes longer for visual-spatial learners to translate their images into words. *Timed activities should only be used if students are competing with themselves rather than others.* If a student has continued difficulty completing assignments in the same time frame as classmates, a comprehensive assessment should be conducted to determine if the student has a processing speed problem. The teacher should modify the amount of time given and record those modifications in the student's permanent record. This will assist the student in qualifying to take college board examinations with extended time. With this type of assistance, non-sequential learners can blossom and become highly successful.

Silverman, L.K. (2002). *Upside-down brilliance: The visual-spatial learner.* Denver: DeLeon.

x	0	1	2	3	4	5	6	7	8	9	10
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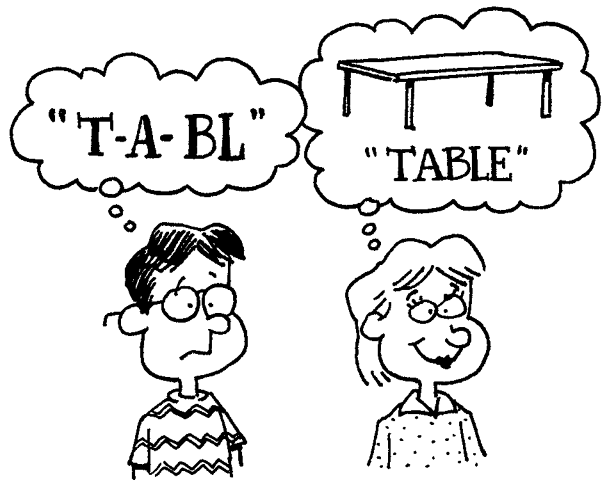
Teaching Reading to Visual-Spatial Learners

Alexandra Shires Golon

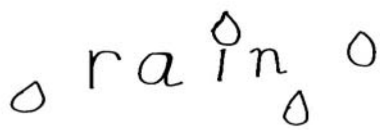


Visual-spatial learners (VSLs) are our artists, inventors, builders, creators, musicians, computer gurus, visionaries and healers. They are empathic and, often, very spiritually aware, even when very young. These children have powerful right hemispheres and learn in multi-dimensional images, while most schools, most teachers and most curricula are a haven for left-hemispheric thinking, or auditory-sequential learners; children who think and learn in words, rather than images, and in a step-by-step fashion. Though visual-spatial students are often very bright, they don't always find success in academic environments.

Those who favor the right hemisphere of their brains, kids I refer to as "topsy-turvy," are at a disadvantage in traditional classrooms. One of the many challenges they face is learning to read. In today's schools, most children are taught to read using a phonetic approach. However, for the visual-spatial learner (VSL), this is counter-intuitive to how they think and learn. Many VSLs have a hard time with phonics because the strategy is to teach reading by breaking down words into their smallest sounds like: ra, ta, ga, and fa. Then, you are to build on those small sounds to form whole words. Visual-spatials understand big picture information first, not the smallest details! Because VSLs think in pictures, they need to read in pictures. What is the picture of "ga"? Or of "the?" *Can you create a mental picture of "the"?* But when VSLs are taught to read by looking at whole words first, not the smallest sounds, they can easily create mental pictures for those words and learn them permanently. A beginning reader can make mental pictures for numerous sight words and often, the more difficult the words, the better. There is a distinction in the shape of the letters that form "xylophone" or "Disneyland," that the visual-spatial won't find when reading the word, "an".

Some words just naturally make you think of a picture because of the shape the letters make; like the letters "M" and "N" do in the word MouNtaiN.

Or "rain" when you add a raindrop to dot the "i" like my son did for me.



Your beginning readers can probably think of many more ways to draw words that include pictures. For words that they can't create a picture for (like "an," or "the"), they can make a picture of the word by shaping it out of string, Wikki Stix, or clay. Some schools use letters made out of sandpaper so the student can trace over the shape of the letter with a finger. Any of these techniques will help to create mental images of the new words they are learning to read.

Whole words can be placed on large index cards and hung from a key chain or stored in a special word box. Then, the beginning reader can practice sorting all the words with similar starting sounds, similar ending sounds or other categories they think up. This is called, "analytic phonics," and will help any reader become even better.

Speed reading

I have one huge tip for visual-spatial learners regarding reading: speed read! Just like beginning readers have no need for picture-less words such as "the," "and," "like," and so on, the child who is ready to progress in reading isn't creating pictures for these words, either. So, just skip them! Have your visual-spatial children practice running their fingers, very quickly, over one line of words, then the next. Teach them to just jump right over the words that their mind doesn't have a picture for. Here's an example. First, read this sentence:

Then, on the following morning, Jody ran to the nearby grocery store to fetch a gallon of fresh milk for his mother.

Now, watch how much easier you can make reading this line by skipping over the words that have no mental picture, by reading only the words that create an image in your mind:

Morning, Jody ran store gallon milk for mother.

Can you do it? Can you skip the picture-less words? Was it easier? Are you missing any facts from the first sentence? Does the sentence with much fewer words still make a picture in your mind of what the character is doing, when and for whom? You don't even need the adjective "fresh" because you know he's buying it that morning, right? Isn't it easier to make a mental picture when you don't have to stop and read the picture-less words? The next time your kids have a reading assignment, try speed reading with them and see if it helps speed the process yet aid in remembering all the details.

If your children need help recalling the pictures they are mentally creating, have them keep "notes," as actual drawings. They should do this in the margins, if it's their book or in a separate notebook if the book does not belong to them. Really important information such as the plot of the story, or dates of information, or names of characters they are studying, should be included in their drawings.

Re-reading for important information

Remember reading your own schoolbooks and saying to yourself, "Whoa, I know that's gonna be on the test"? Did you know this because what you just read had a name or date or definition or because it was printed in bold or italic letters? When I was in school, I used to fold the corners of the pages that had this kind of important information which got me in hot water because the book had to be used again the next year and the pages would already be "dog-eared." Today's office supply stores offer so many great products including sticky Post-It tabs that come in a variety of colors. Show your kids how to use them to mark the exact line on a page of the important information they just read. They can stick them right on the line of the text, with the colored tab sticking out off the side of the page. This way, they can easily find the exact line they need to remember. They should use certain colored tabs for certain types of information. Maybe green tabs are for dates they have to remember? Or blue tabs for names? Whatever system works for them.

One more note about reading

If your visual-spatial kids are having difficulty reading, you might consider offering comic books or fantasy books with lots of visuals. Perhaps books on something they really want to learn about, a favorite animal, or children in another country, or something they will find interesting enough to keep trying. You might consider checking out recorded books from a library. Nearly every book they might be asked to read for a book report is available on tape or CD. Don't replace reading with a movie or made-for-TV version, though. Too much of the story may have been changed and they'll miss the chance to create their own characters and scenes in their imagination. But listening to a book, instead of reading it themselves, will free them to use the author's words to create mental movies. Listening to the story often helps visual-spatial learners remember the plot and characters better because they can then "see" the story. When they listen to the story, they don't have to spend time decoding the words and forgetting to follow the story line.

Also, many books come with larger print size. Often this makes it easier on their eyes. Or, you could photocopy a book's pages to make the print size larger. Some kids find reading easier when they use a colored transparency, like yellow or green, and place that over the page. Also, there are books by Barrington Stoke Publications that are printed on special paper using a font that has been proven easier to read for many. You can find these at www.BarringtonStoke.co.uk.

Other strategies for helping beginning readers conquer this new task include using magnetic letters and words on refrigerators and file cabinets, and labeling everything in your house including the furniture, stairs, doors, etc. Make your home one gigantic visual dictionary! You can also play games with words: what rhymes with ____, or play Scrabble®, or Boggle® with added pictures, make up your own games! Use clay or Wikki Stix® to write (shape) fun and interesting words that will become mental pictures for them.

Whatever strategy you employ to help your beginning VSL reader, know that they will eventually master this skill, they just may not be wired for learning it the "old-fashioned" way, by using phonics. There are other options available. A sight or whole word approach is often what helps them break the code. Be sure to encourage reading all the time by continuing to read to your children, even after they have mastered reading. As an early grades teacher, I saw plenty of reluctant readers who were afraid of losing "Mommy" or "Daddy Time" if they learned to read on their own. At 11 and 13, my children and I still enjoy cuddling on one sofa or bed for a good story.

A VISUALIZATION APPROACH TO SPELLING*

Linda Kreger Silverman, Ph.D.

1. **Write the spelling word in large print in bright colored ink on a card. Put the letters that are most difficult to remember in a different color.**

2. **Hold the card at arm's length, slightly above eye level.**

3. **Study the word, then close your eyes and picture the word in your mind's eye.**

4. **Do something wild to the word in your imagination. (The sillier the better!)**

5. **Place the word somewhere in space (in front of you or above your head).**

6. **Spell the word backwards with your eyes closed.**

7. **Spell the word forwards with your eyes closed.**

8. **Open your eyes and write the word *once*.**

***Borrowed from Neurolinguistic Programming (NLP).**

How to Turn on the Right Hemisphere

Linda Kreger Silverman, Ph.D.

1. **Use humor whenever possible: Humor gets the right hemisphere into the act.**

2. **Present it visually. Use overheads. Draw pictures. Show them—don't just tell them. Have them picture it.**

3. **Use computers. Computers *show* rather than tell. They teach visually with no time limits.**

4. **Make use of fantasy. Provide lots of opportunities for students to use their imaginations!**

5. **Use hands-on experiences: manipulatives, construction, movement, action.**

6. **Make it challenging. Challenge integrates the two hemispheres.**

7. **Use discovery techniques: finding patterns, inductive learning, inquiry training.**

8. **Put it to music. Let them sing it! Let them dance it! Let them chant it! Rhythm will be remembered.**

9. **Get their attention! Talk louder, talk faster, be more animated, use gestures. Do something silly.**

10. **Make them winners. Involve them in competition they are guaranteed to win: Read one more book than last week; Beat your record on times tables.**

11. **Teach to their interests: find out what turns them on. What are their hobbies? What do they do after school? What do they want to be when they grow up?**

12. **Emotion works wonders. Use emotionally charged material. Show them you care about them.**