Upside~Down Brilliance: The Visual~Spatial Learner

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Are You a Visual-Spatial Learner?

Please complete the following quiz to find out more 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 slow and 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.

This book was written for you!

(Hint: Start with the last chapter.)

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

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

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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 apart everything in the house to see how it operates. They also are very creative, dramatic, artistic and musical.

At the Gifted Development Center (GDC), we have been exploring the visual-spatial learner phenomenon for over 3 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. 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. Added together, nearly *two-thirds* have a visual-spatial preference. Only 23% (less than one-fourth) were strongly auditory-sequential. These validation studies were conducted in urban and rural settings, in which over 40% of the children were Hispanic. In one study, 69% of Native American children preferred the visual-spatial learning style. This suggests that a substantial percentage of the school population would learn better using visual-spatial methods.

Two books on visual-spatial learners are available from GDC: *Upside-Down Brilliance: The Visual-Spatial Learner* by Linda Silverman and *Picture it! Teaching Visual-Spatial Learners* by Betty Maxwell and Crystal Punch [www.gifteddevelopment.com].

About Spatial Learners
Betty Maxwell

There appear to be two major ways of learning: auditory-sequential (more left hemispheric) and visual-spatial (more right hemispheric).

Auditory-sequential learners are good listeners, learn well in a step-by-step process, tend to be rapid processors of information, and are generally able to express themselves well verbally. They are often able to compartmentalize their reasoning from their emotions.

In contrast, visual-spatial learners are excellent observers, comprehend holistically – may have sudden aha! understanding that leaps over steps – appear to think in images, may need translation time to put their ideas into words, and sometimes have word retrieval problems. Their thinking and emotions are very intertwined.

More about visual-spatial learners:

1. They have an excellent sense of direction and can remember how to get somewhere they have been. Inside a building, they will know what's above or below them.
2. They are excellent visualizers. They can learn to hold long words or strings of numbers in their mind's eye and work on them. (Many prefer mental math to written math.) They can manipulate, rotate and transform images. They can work with moving images.
3. They will remember what they see or visualize but may forget what they hear. They may mishear because of drifting attention or auditory processing problems.
4. They often have sequential weaknesses, particularly in handwriting. Phonics and memorization of math facts are also often weak areas.
5. They may be much better map readers than readers of printed lines. Left and right may be interchangeable for them, hence reversals and mirror writing and reading.
6. They do better with complex material; simple material is hard to hold their attention to.
7. They are disorganized, lose things easily, have a poor sense of time, don't plan ahead. They need help with organization and structure.

Helpful Techniques for Visual-Spatial Learners

1. Teach to the student's strengths. Help students learn to use these strengths to compensate for weaknesses. Imagination, creativity, visualization and pattern finding are major strengths.
2. Present ideas visually on the chalkboard or on overheads. Use videos, posters, charts, graphs, computer software, and diagrams. Use manipulatives liberally.
3. Let them observe others before attempting new tasks. Show examples of the finished product requested.
4. Present an overview of the subject being taught. Use metaphors and analogies to give a sense of the whole.

5. Use a sight approach to reading rather than phonics. Supplement with word patterns, roots and affixes, decoding as puzzle solving.
6. Use books rich in visual imagery to enhance interest and ability in reading. (Be aware that some visual-spatial learners may need initial help in learning to visualize.)
7. Employ a computer for both instruction and student writing assignments. Teach keyboarding as soon as possible.
8. Avoid timed tests. Give power tests, which will better reveal mastery.
9. If a bright student struggles with easy, sequential tasks, experiment with more advanced, complex work. Acceleration is more beneficial for these students than remediation.
10. Teach the student to visualize spelling words, math facts, etc. They will remember what they see (in the mind's eye also) and may forget what they hear.
11. Give more weight to contents of papers than to format. Teach mechanics apart from response to content.
12. Have them discover their own methods of problem solving instead of teaching step by step. For instance, give them some division problems with the answers and allow them to figure out how the answers were arrived at. Then have them see if this method works with new problems.
13. Avoid drill, repetition and rote memorization; use more conceptual approaches and fewer, more difficult problems.
14. Be emotionally supportive. These learners are keenly aware of their teachers' reactions to them. Success is related to perceptions of teachers' empathy.
15. Allow time for formations of answers and word retrieval. Support well thought out answers above fast ones.
16. Emphasize creativity, imagination, new insights, new approaches rather than just acquisition of knowledge. Creativity should be encouraged in all subject areas.
17. Group visual-spatial learners together for instruction.
18. Engage students in independent studies or group projects that involve problem finding (and problem clarification) as well as problem solving.
19. Allow them to construct, draw or otherwise create visual representations of concepts.
20. Silent reading may be better than oral reading. Ask comprehension questions and allow them to find answers through reading silently at least part of the time.
21. Teach them to retrieve material in their visual memory banks by looking up.
22. They will do better when allowed to display what they know, rather than being put on the spot, as with flash cards (you're right or wrong each time.) Spread the cards out and allow them to pick out what they know.
23. Memorization of facts is a weakness. Use visualization and mnemonics as aids.
24. Humor and playfulness actually increase learning; use liberally (but no sarcasm).
25. Play "What's My Rule?" These pattern finders are good at discovering rules and principles.

Betty Maxwell is Director of Visual-Spatial Resource of the Gifted Development Center. For more strategies for visual-spatial learners, please go to <u>www.VisualSpatial.org</u>.

Helping Visual-Spatial Learners with School Problems to Succeed in Elementary School

Visual-spatial learners are people with a different learning style. They do well in life as engineers, scientists, architects and mechanics. However, they often have problems in school. They can learn the material, but they do so using a different process:

- They are excellent visualizers and *must* visualize in order to learn. With training, they can visualize and recite a string of 10 to 16 numbers forward and backward.
- They think in pictures, not words, and usually have great trouble expressing themselves in words. They need time to translate their pictures into words. Their handwriting is often hard to read and their spelling is idiosyncratic.
- They are gestalt learners who constantly search for meaning. They thrive on complexity, often fail at simple tasks and understand details only when they relate to the whole concept. For example, they can learn algebra before the times tables.
- The *do not* learn by rote and repetition; a few examples or problems are enough.
- They tend to be divergent thinkers. Because they focus on the larger picture, they often don't know how they have arrived at a conclusion or solved problem.
- They have problems following sequential material presented orally. They can overcome this limitation if the material is sufficiently complex and of particular interest.
- They tend to have a poor sense of time.
- They are acutely award of (often hypersensitive to) everything in their environment.

Ways elementary school teachers can help visual-spatial learners:

1. *Reading*: The lucky ones teach themselves how to read before they go to school. They need meaning, and respond to language experience and whole language approaches. They do not learn by phonics alone, and they cannot divide a word like "bat" into three sounds and then blend the sounds together. They can grasp prefixes, roots and stems early on. They also can learn basic phonics rules.
2. *Spelling*: Write each spelling word on a sheet of paper using different colors and big letters. The learner looks at the word, closes eyes and visualizes the word, spells it orally backward and forward, then writes it forward.
3. Put spelling words and other assignments on handouts. Do not expect them to copy correctly from the chalkboard or take letter-by-letter dictation correctly.
4. Have the learner sit in front of the room to minimize distractions but at least four to six feet from the chalkboard.
5. Give oral tests and untimed tests.
6. Find ways other than writing by hand for the learner to demonstrate competency. Give two grades on papers—one for content and one for mechanics.
7. Pause during verbal presentations so the learner can visualize what was said.
8. Use rhythm and music to enhance learning.
9. Allow the learner to tape lectures and discussions.
10. Inform a parent if assignments are not being turned in or classwork is not being done and see if brainstorming together produces a solution.
11. Relish and reward diversity and divergent thinking.

Jeffrey Freed and Linda Silverman, 10/93

Helping Visual-Spatial Learners with School Problems to Succeed in Secondary School

Visual-spatial learners are people with a different learning style. They do well in life as engineers, scientists, architects and mechanics. However, they often have problems in school. They can learn the material, but they do so using a different process:

- They are excellent visualizers and *must* visualize in order to learn. With training, they can visualize and recite a string of 10 to 16 numbers forward and backward.
- They think in pictures, not words, and usually have great trouble expressing themselves in words. They need time to translate their pictures into words. Their handwriting is often hard to read and their spelling is idiosyncratic.
- They are gestalt learners who constantly search for meaning. They thrive on complexity, often fail at simple tasks and understand details only when they relate to the whole concept. For example, they can learn algebra before the times tables.
- The *do not* learn by rote and repetition; a few examples or problems are enough.
- They tend to be divergent thinkers. Because they focus on the larger picture, they often don't know how they have arrived at a conclusion or solved problem.
- They have problems following sequential material presented orally. They can overcome this limitation if the material is sufficiently complex and of particular interest.
- They tend to have a poor sense of time.
- They are acutely award of (often hypersensitive to) everything in their environment.

Ways middle school and high school teachers can help visual-spatial learners:

1. Have the learner sit in front of the room to minimize distractions but at least four to six feet from the chalkboard.
2. Write all assignments and directions on handouts or the board. Include dates due.
3. Don't assign a lot of problems for one concept. A few examples are sufficient.
4. Allow the learner to tape lectures and discussions.
5. Give oral tests and untimed tests and let the learner know they are untimed. The class period is often perceived as an implied time limit.
6. Allow the learner to use a computer for class work, assignments and tests.
7. Give two grades on papers: one for content and one for mechanics.
8. If teaching note taking, accept notes that are in pictorial format, not words.
9. If a lab notebook is required, allow the learner to transcribe class notes on computer and paste in typed notes or use a loose-leaf binder.
10. If teaching social studies, emphasize concepts – not dates and names.
11. Inform a parent if assignments are not being turned in or classwork is not being done and see if brainstorming together produces a solution.
12. Grade on material learned. Don't require everyone to use the same process to learn.
13. Relish and reward diversity and divergent thinking.

Jeffrey Freed and Linda Silverman, 10/93, secondary

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.

Reference

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

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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