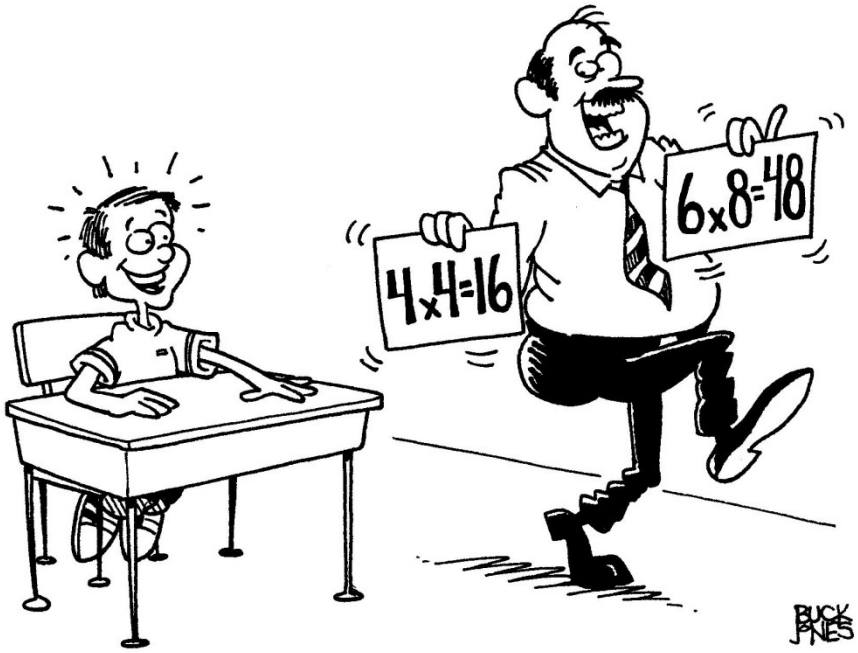
Nothin' But the Facts!

A Visual-Spatial Strategy for the Times Tables



Teach the Times Tables in One Week or Less!

*(*An Excerpt from *The Visual-Spatial Classroom: Differentiation Strategies that Engage Every Learner)*

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Dedication

To every student who has wanted to learn the times tables,
but wasn't taught them visually…*until now!*

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Nothin' but the Facts is included as Chapter Eight: Teaching Math Facts in *The Visual-Spatial Classroom: Differentiation Strategies that Engage Every Learner.*

A Note About Learning Styles

Visual-spatial learners, or VSLs, are people (kids and adults) who think in images. Auditory-sequential learners, or ASLs, think in words. If you're an auditory-sequential learner, as most of the teachers I've met and worked with are, I'll bet you can't even imagine thinking in pictures, right? The same is true for visual learners: they can't imagine being able to think in words! A few people can think in both pictures and words, or switch between the two, but that is rare.

Can you guess which student below is visual-spatial and which is auditory-sequential?

Neither of the kids above is happier than the other, nor is either one doing anything more efficiently or accurately than the other. Certainly, neither is doing anything wrong. Each child is thinking and assembling in the manner that works best for him or her. One is putting the model together in a

step-by-step, follow the directions style, the other is completing the project from a mental picture. There's no right or wrong way to complete the project just as there's no right or wrong way to think and learn. There is only what works best for each of your students.

School is geared to left-hemispheric learning. We teach in a step-by-step manner and require mastery of one area before progressing to a higher level. We also tend to teach, particularly in the higher grades, in a strictly auditory fashion, leaving manipulatives and hands-on learning for younger students only. Those who favor their right hemisphere are at a distinct disadvantage. Because they are presented with new material in a sequential fashion, they are required to use their weaker hemisphere, rather than their stronger.

This is analogous to an individual breaking the arm of a dominant hand and being forced to handwrite with the weaker hand. Eventually, and with much practice, the individual will be able to produce legible writing, but it will never be the most efficient means, nor the most beautiful writing that he or she is capable of. Only when the ability of the dominant hand is returned, can the individual produce his or her best work. Only when we create classrooms that allow visual-spatial students to access the right hemisphere will we afford them the opportunity to produce their best work and learn in the most efficient manner for their learning style.

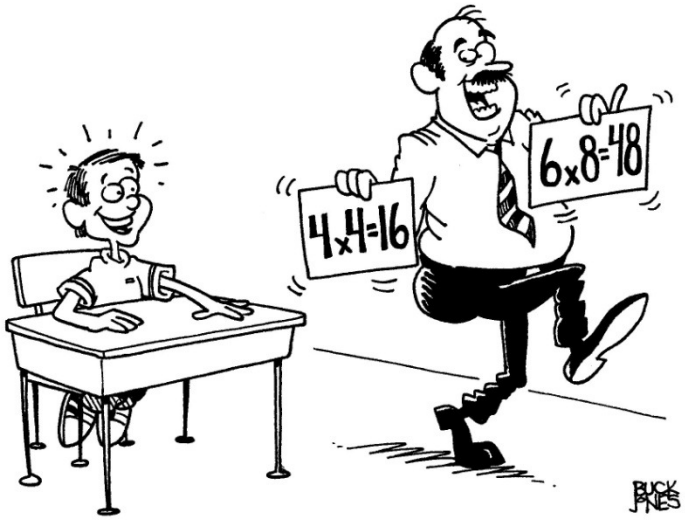
Here's the best news: Engaging the right hemisphere is good for *every* student, regardless of their preferred learning style. That's right! By teaching to the visual-spatial students in the room, in ways that activate and engage the right hemisphere, you can more effectively reach **every single student**. Dr. Jerre Levy, a brain researcher from the University of Chicago, who is credited (along with Dr. Roger Sperry) with discovering the specific functions of each hemisphere of the brain, is quoted:

> The right hemisphere is especially important in regulating attentional functions of both sides of the brain. Unless the right hemisphere is activated and engaged, attention is low and learning is poor. (Levy, in Silverman, 2002, p. 15)

Dr. Levy is referring to all students, not just those who prefer a visual-spatial learning style.

So, how can we teach the times tables in a way that honors visual-spatial abilities, or "activates the right hemisphere"? That's just what I hope you'll discover in this book. If you'd like more information about identifying the preferred learning style of your students, please visit the ***Visual-Spatial Resource*** at www.visualspatial.org where you'll find our VSL Quiz (for Teachers, Parents and Kids), articles for teaching a variety of subjects, and more!

Teaching the Times Tables in One Week or Less!



If you're using Mad Minutes or some other form of rote memorization technique to help your students memorize the times tables, I want to ask you to set those materials aside for just one week. If you'll try the tips in this chapter, I'm confident you can get every student to create permanent images of each multiplication fact that they can easily recall. Just try them! Visual-spatial learners are at a distinct disadvantage with memorization and timed tests because they cannot employ their strengths in any way that helps them succeed. Using images, music and humor, and helping your students to discover patterns in numbers, will use the

strengths of the right hemisphere and offer them an advantage at mastering their times tables.

Let's start with a copy of the next page to use with this chapter (The Math Grid and each partially completed grid are also available at the end of this book, along with a number of other helpful visuals):

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0													
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

I usually start by commiserating with the kids: “This grid is pretty big, huh? There are 169 facts in there. How on earth are you going to memorize 169 facts?” As visual-spatial learners, they’re looking at the big picture, the entire grid. If they don’t know many of the facts already, they’re probably beginning to panic—169 facts is a lot of facts.

Start with the facts they know right from the start. Probably the 0s, the 1s, and the10s, right? Let’s fill those in. Your students’ grids should look like this when you’re done (this is shown full-page size at the end of the chapter so you can create an overhead from it, if you choose):

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2									20		
3	0	3									30		
4	0	4									40		
5	0	5									50		
6	0	6									60		
7	0	7									70		
8	0	8									80		
9	0	9									90		
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11									110		
12	0	12									120		

Now take a piece of paper and lay it diagonally across the grid so that only the upper right half of it is showing. It should look like this:

X	0	1	2	3	4	5	6	7	8	9	10	11	12
	0	0	0	0	0	0	0	0	0	0	0	0	0
		1	2	3	4	5	6	7	8	9	10	11	12
											20		
											30		
											40		
											50		
											60		
											70		
											80		
											90		
											100	110	120

Demonstrate to your students that every number on the half of the grid that is showing has a matching number in the half that is covered. Tell them that this is known as the commutative principle. In algebra, it is shown as a * b = b * a. Or, 10 x 3 is the same as 3 x 10. The grid just got a whole lot smaller! They only have to learn half of it. (And your students just learned some algebra without even trying! The kids I've worked with love knowing they're learning algebra already.)

I think the next easiest number to multiply by is probably the 11s. Have your kids fill in the rows for the 11s, up to 11 x 10, on the grid. I have some fun tricks for 11 x 11 and 11 x 12 that I'll share later.

Do your students know how to skip count? Most kids I've worked with can skip count by 2s and by 5s. If they don't know how to skip by 5s, teach them that every answer for the 5s must end in either 5 or 0. There's a pattern to it, which their right hemispheres will love! Have them add those answers to their grids:

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6			15					30		
4	0	4	8			20					40		
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12			30					60		
7	0	7	14			35					70		
8	0	8	16			40					80		
9	0	9	18			45					90		
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22			55					110		
12	0	12	24			60					120		

Remember that one of the things a right hemisphere loves is rhythm, that's why it enjoys music so much. Here are some easy facts to learn because of the rhythm in the equations:

5 x 5 = 25 6 x 6 = 36

6 x 4 = 24 6 x 8 = 48

Try teaching these rhyming equations as your students jump on a trampoline or have them stand and bounce, or jump, to the rhythm. Any time you can get their bodies into the act of

learning, you've used another tactic of engaging the right hemisphere.

The right hemisphere also enjoys humor and tricks. These are simple ways to remember three more equations:

You have to be 16 to drive a 4 x 4. (16 = 4 x 4, or 4 x 4 = 16)

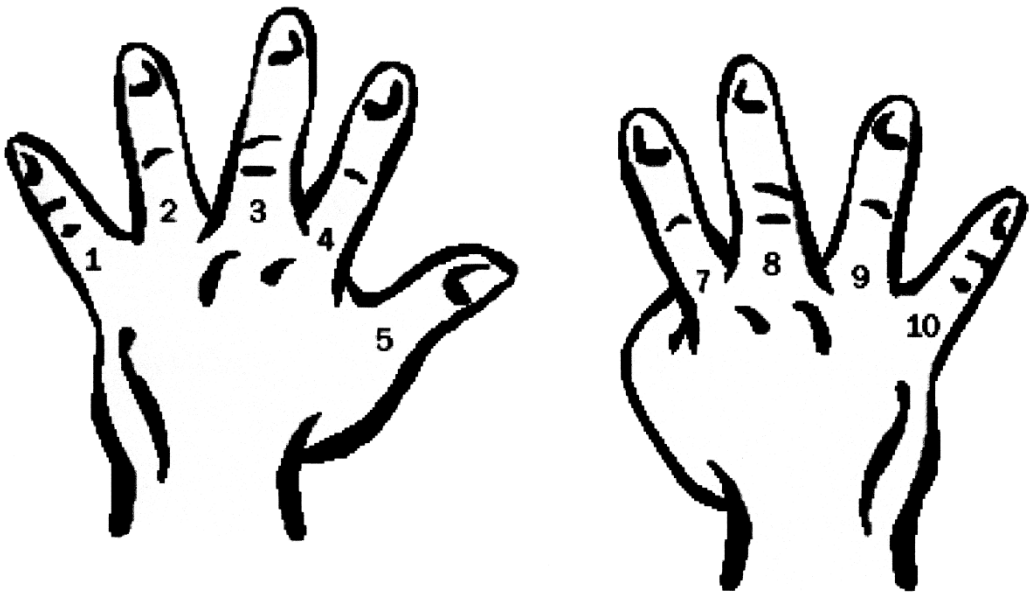
5, 6, 7, 8 is what you remember for 56 = 7 x 8 (7 x 8 = 56)

1, 2, 3, 4 is what you remember for 12 = 3 x 4 (3 x 4 = 12)

Now, have your kids add these answers to the grid.

I think the next easiest number to multiply by is the 9s. There are so many tricks for remembering the 9s times tables, your students can pick a favorite! First, there's the "finger method." What you do is assign each of your fingers a number, as shown below:

Finger Method of Multiplying by Nines



In this example, the equation would be asking 6 x 9, because the finger assigned as number 6 is folded down. That leaves five fingers up on your left (those represent the tens digit) and four fingers up on the right. (Those are the ones.) The answer, then, is 54! Have your students try this with all the equations for the 9s.

If they don't like the finger method, or they need further reinforcement, show them how to look for patterns. The right hemisphere loves uncovering patterns and the 9s have great patterns to discover. First, for every multiple of 9, the digit in the tens column increases by one while the digit in the ones column decreases by one:

9
18
27
36
45
54
63
72
81
90

Next, no matter what you are multiplying 9 by, as long as it's between 1 and 9, the two digits of your answer will always add up to 9. For example, in the equation 4 x 9 = 36, the digits 3 + 6 = 9.

The last pattern I know of with the 9s is that all the possible answers have reverse answers. In other words, one possible answer is 09, another is 90, one is 18, and another is 81. Show your students the following pattern:

09
18
27
36
45
54
63
72
81
90

Now, have your students add all the answers for the 9s to their grids.

OK, on to the 3s. Borrow or purchase a copy of the Schoolhouse Rock multiplication videos (www.school-house-rock.com, “Multiplication Rock”). These used to be commercials on Saturday morning television in the 1970s. Now, you can get them on video or DVD. There are even short cartoons for American History and English grammar. The song they made up for memorizing the 3s is very catchy—your

students won't be able to get it out of their heads! And, once it's in their heads, they'll be able to skip count by 3 easily. If you can't get a hold of these videos, write the following numbers on a piece of blank white paper. Create your own rhythm (or have your students create one!) for memorizing the order. It helps if you do this in sets of three (3, 6, 9 pause, 12, 15, 18, etc.)

3 6 9 12 15 18 21 24 27 30

Notice there are three numbers in the ones category, three in the teens and three in the twenties. Another pattern! Or, try having your students sing the 3s to "*Jingle Bells*":

"3, 6, 9 12, 15 18, 21 24, 27, 30 and you're done!"

Add the 3s facts to the grid.

Fours are really easy if you teach them as double the 2s. So, if your kids know that 7 x 2 = 14, then to find 7 x 4, they halve the 4 then just double their first answer, or 2 x 6. Have them try this with the rest of the 4s. They can do the same thing with the 6s because 6 is just double 3. So, they should do the multiplication problem with 3 and double their answer. You can show this as the distributive property (you'll find this at the end of the chapter so you can create an overhead to demonstrate it):

6 x 8 = ?

3 x 8 + 3 x 8 =

24 + 24 =
48

After completing the rows for the 4s and 6s, I tell the students, "The grid is really filling up and you haven't even had to work very hard, yet, right?"

The 11s were easy up until 11 x 10, but what about 11 x 11 and 11 x 12 or even higher? Here's a wonderful trick for the 11s (this is also provided in a larger format at the end of the chapter so you can create overheads):

1. First, split the digits of the number you are multiplying by 11. So, let's start with the 11 x 12 and split the 12 like so:

1 2

2. Next, add the digits of that same number. So, in our example of 11 x 12, add the digits of 1 and 2 and place your answer between the split digits:

1 **3** 2

This works for any number times 11! Once you get to a number whose digits are greater than 10, you just add and

carry! So, in the equation, 11 x 68, show your students the following:

1. Split the digits: 6 8

2. Add the digits: 6 (1)4 8

(Point out that obviously the answer can't be 6,148, so we have to carry the ten over to the 6, making it 7):

3. The final answer should be: 7 4 8

Have your students fill in the 11s on their grids and take a moment to reflect how far they've come! The grid is nearly complete and should look like this:

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	
4	0	4	8	12	16	20	24	28	32	36	40	44	
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	
7	0	7	14	21	28	35	42		56	63	70	77	
8	0	8	16	24	32	40	48	56		72	80	88	
9	0	9	18	27	36	45	54	63	72	81	90	99	
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24			60					120	132	

OK, now the 12s. The 12s up to 12 x 9, are just the 2s plus 10 times the number you are multiplying by. So, if you're teaching 12 x 4, first have your students calculate 10 x 4 which equals 40. Then, have them calculate 2 x 4, which equals 8. Last, have them add the two answers, 40 + 8 = 48. They already know 12 x 10 and 12 x 11 from doing them earlier.

Here's another way to teach the 12s. Ask if your students see a pattern in all the possible answers for the 12s. Here they are:

00
12
24
36
48

60
72
84
96
108

120
132
144

If you look at the ones digit of each possible answer, they follow a 0, 2, 4, 6, 8 pattern. Each time the pattern is complete (at "8"), the number in the ones digit skips a beat. Otherwise, the 1s just increase by one! So you have 1, 2, 3, 4, (skip), 6, 7, 8, 9, 10, (skip), 12, 13, 14. Using this method, your students can predict 12 x 15, and beyond!

Have your students add the 12 facts to the grid and notice how many empty boxes remain: There are only two facts left: 7 x 7 and 8 x 8!

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42		56	63	70	77	84
8	0	8	16	24	32	40	48	56		72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Here's how you're going to teach those last two facts so that they're memorable. There's an easy sports trick for 7 x 7: The 49ers are a professional football team in San Francisco. Below is a visual for how the players on a football team might be in position. Show your students how there are seven players in a row and that these are referred to as the

“linemen.” While each team has 11 players on the field for every play, only seven linemen can be at the front line at a time. So, 7 x 7 = 49(ers!) Here are two “teams” of players, represented by Xs and Os:

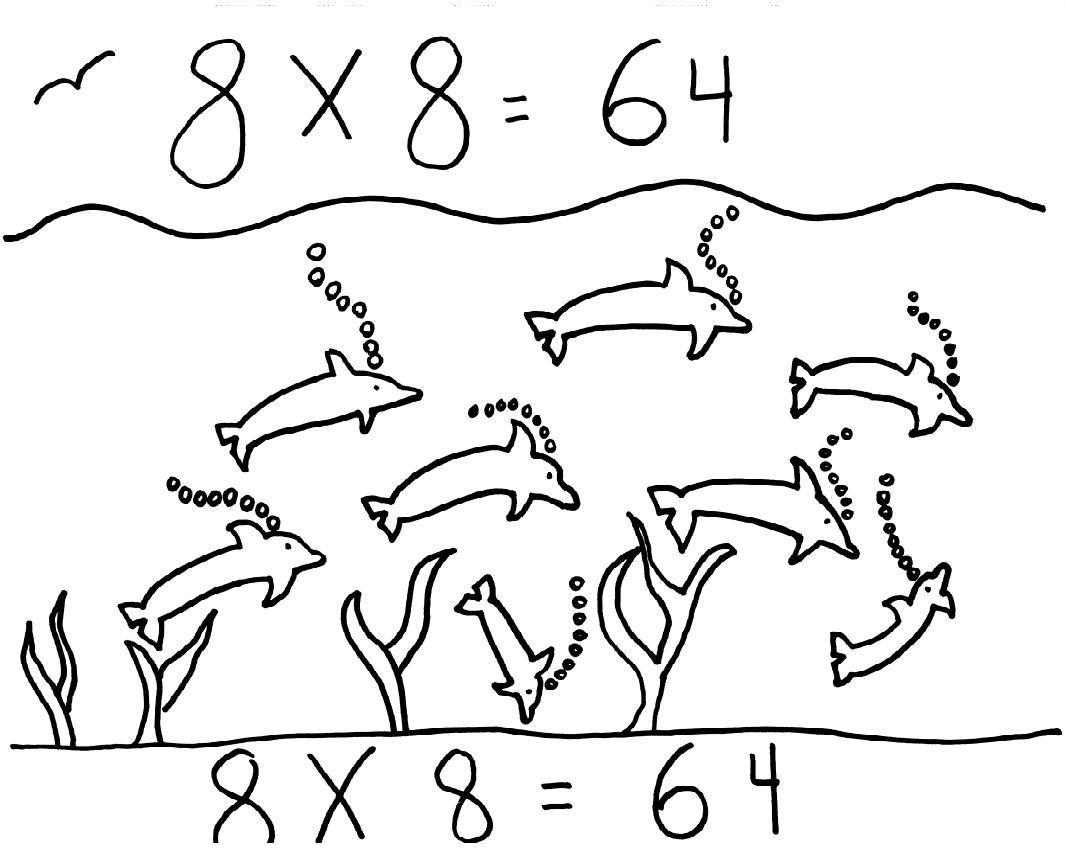
```
X                   X           X
                            X
X       X   X       X       X       X       X

O       O       O       O       O       O   O
            O       O       O       O
```

Ok, our final equation is 8 x 8. You can try this rhyming trick first:

“Eight and eight went to the store, to buy Nintendo 64!”

But, if your students aren’t familiar with this now outdated gaming system (Nintendo 64), try this: Ask them to think of something they *really* like. They can choose anything they like, from a favorite animal to food, it doesn’t matter. Let’s say someone chooses dolphins. Now, to master the equation 8 x 8, for example, ask that student to take a blank piece of paper and draw eight dolphins, each with eight bubbles above their heads. Now, have the student write across the top and bottom of the paper, 8 x 8 really large and in color. Then, ask the student to count all the bubbles and place the answer, 64,

at the end of each equation, on the top and bottom of the page.



Send the illustrated equation home with the instructions that the student is to tape the picture on a mirror to study while getting ready for bed, or above the bed, so that it is the last thing the student sees before falling asleep. Tell your students to make permanent mental pictures of their drawings, including the equation. They can replace the dolphins with anything that interests them, just make sure they have eight of a subject with eight of something else (pieces of pizza with slices of pepperoni; birthday cakes with candles, ice cream cones with scoops, donuts with sprinkles,

squirrels with nuts, horses with apples, elephants with peanuts etc.). In order for the technique to work, however, each student must have an *emotional connection to the subject* (that's why you had them choose some food or animal they *love*!) and they must draw the picture themselves, using no clip art or cut out pictures. Remember the story of the doodler in the World History class? When students draw something, they own it!

> I told him to not try & "work it out" but to just put the 'picture' of the equation and its answer in his head. Suddenly he knew 5 equations he hadn't known at the start. He could see "9 x 9 = 81" in his "TV Screen" and I was floored. He now sleeps with a times table chart above his head; first thing he sees each morning and last thing he sees each night and he is learning more of those all the time! (*J.M., parent from Australia)*

Your students should also use this technique for any of the facts that didn't stick with the other methods. Be sure they use different animals, or other things they care about, for each equation, though. The technique won't work if they use the same image for different math facts.

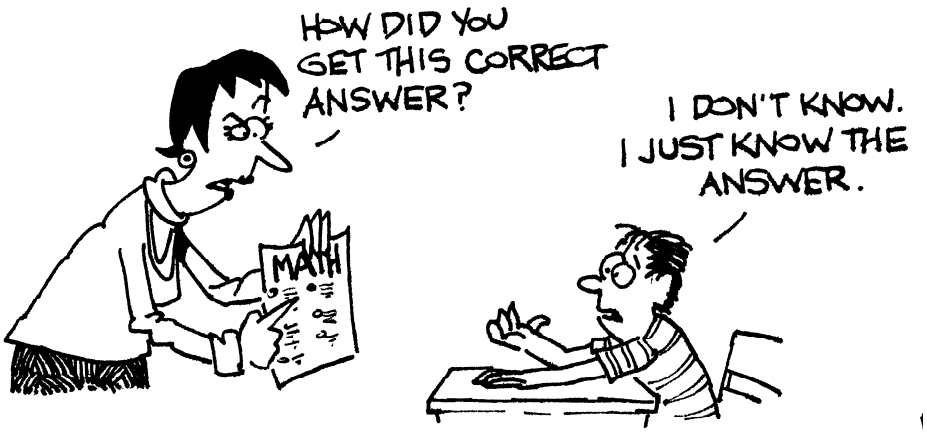
That's it! Most students are able to permanently learn their math facts in ***less than one week*** when they use these visual strategies and without the dreaded timed tests.

Division is just the reverse!

> *… my six year old [daughter] - is giving me answers to basic division questions by "finding the times picture and going backwards!"* (C. J., teacher and parent from New Zealand.)

So what about division? For a lot of the simple division problems (as opposed to long division problems), if your students truly have a picture of the multiplication fact, they'll be able to see the answer right away. For example, when they learned that, "You have to be 16 to drive a 4 x 4," they created a mental picture of the equation 4 x 4 = 16. So, if they were asked 16/ 4 = ?, they should be able to see the missing number from their picture. When they learned 6 x 6 = 36, the picture of that rhyming equation should be clear to them when they are asked 36 / 6 = ? What about the equations that they drew pictures for? If your students really do have that picture in memory, they'll be able to see which number is missing when asked the division problem.

Long division – showing the work



Do your visual-spatial students answer math problems accurately, but rarely show any steps taken? Can some of them solve complex long division or algebraic equations, but not be able to tell you how they arrived at an answer? For visual-spatial learners, there are few requests more frustrating than, "Show your work." Because this type of learner intuitively grasps the "big picture" rather than taking what would be a painfully slow series of steps to reach a conclusion, the demand to "show your work" is nearly an impossible task. VSLs very often just see the correct answer—*and they're usually right*. They can't tell you how they know, they just know. They can't show you how they got their answer, they just got it.

Because most teachers are sequential thinkers, we teach in a step-by-step manner and expect our students to solve math problems in a step-by-step fashion. We also tend to

anticipate that our students will be able to demonstrate their work by detailing the steps they took to arrive at their answers. The same is true for textbook developers and those who construct state achievement tests. This has had a devastating, unanticipated outcome for those who think in pictures and see the correct solution without ever taking a step. Every day, students are admonished, even accused of cheating, because they are intuitively able to reach accurate solutions to complex math problems but absolutely unable to explain how they got there. Most of the time, they lose partial or full credit for their answer because they did not show their work. At a time when "thinking outside the box" is a revered ability in the business world—when to be able to find solutions to complex problems is highly regarded—it's time we stop penalizing these students for their innate gifts and begin honoring what comes naturally to them.

Until that day, however…

It is quite likely that visual-spatial students sitting in math classes at all different levels are being docked credit for answers they cannot support with detailed steps. Nearly every standardized achievement test in the United States deducts credit when the steps are not shown to solve a particular problem. So, I propose it's time we teach visual-spatial learners to fight back! "Show your work," doesn't have to mean

complete the problem exactly as a left-hemispheric, auditory-sequential thinker would. It means, teach me, the left-hemispheric, auditory-sequential thinker, how you did this so I can do it myself. Show me, in the way I learn best (step-by-step), how to do this. When students know the material well enough to teach it, they really know it. If we help our visual-spatial students learn how to explain their answers to someone who does not think in images, then we've succeeded in teaching them to show the details in reaching their conclusions. Here's what one parent wrote about this technique:

> Dolls are useful. When E is having trouble with a concept, I have her "teach the dolls". For some reason the act of teaching the dolls helps her get things straight in her own mind and all of a sudden she "gets it". *(From K. C., parent)*

Until we've created an understanding of different learning styles so pervasive that our state tests accommodate this learning style, we'll have to help our visual-spatial students cope with predominantly left-hemispheric tests. By teaching them how to communicate to those who do not think like they do, who do not immediately see the picture (or answer), they may be able to beat a system that unfairly docks credit due them.

First, allow visual-spatial students to perfect whatever strategy works for them in solving their math problems. This is another opportunity to group students based on their

preferred learning style. (See The Visual-Spatial Classroom: Differentiation Strategies that Engage Every Learner for more information on this.) Have them test their methods with a calculator to be certain their answers are correct. Once the students have polished their unique systems, gradually increase the level of difficulty of the problems to continue to test their methods. Once they have consistently answered the problems correctly, using their own strategies, show them how to work in reverse. In other words, they can continue to use the method they devised (so long as they produce accurate results) to arrive at an answer and then they work backward through the problem to show the details to someone who needs to be shown the steps, or "work."

For example, in the long division problem below, let's suppose that the student, using whatever mental or written method this student has created, arrives at a solution and has proven it is correct by double-checking the answer with a calculator.

```
      26
15 ) 390
```

Now that the answer is known, the student simply works through the solution to show the steps. So the first "work" to show is 15 x 2. This answer is then written directly under the 39:

```
      26
15 ) 390
      30
```

Next, show the student that the next “work” to write out is to subtract the 30 from 39 and bring down the next digit:

```
      26
15 ) 390
     30
      90
```

The student doesn’t need to figure out how many times 15 goes into 90, because he or she already knew (saw) that! It must be 6. But this step needs to be shown, so just write out the last bit of work:

```
      26
15 ) 390
     30
      90
      90
       0
```

While it may seem obvious to the student, the last number showing in any problem such as this must be 0 or the work has not been shown in a manner in which the auditory-sequential learner can follow.

By working backward through problems, in math and other areas, too (creating an outline of a report after the report is written qualifies as working backward!), visual-spatial learners can demonstrate the steps of their work. Then, the auditory-sequential learners they must communicate with (primarily, we teachers) can understand exactly how these students arrived at their answers. We open the doors by allowing them to work backward. Demonstrating their work in

a manner that can be interpreted by sequential thinkers, visual-spatial learners can finally receive grades commensurate with their abilities.

Note: If your students have difficulty keeping their numbers lined up correctly when doing division, try having them turn lined paper sideways so they have columns to place the numbers in. Or, they can use graph paper to help keep numbers aligned.

Using math manipulatives

There are lots of great products for "seeing" how math works and they're not limited to younger grades, either. If your students are having trouble learning a particular math concept, find or make manipulatives you can use so they can ***see*** the math. Once they have a picture of how math works, many will understand the importance and enjoy the fun in this subject. The problem comes when students aren't given a chance to use something hands-on to watch how an equation comes together. They literally can't see how it happens and are turned off to math, sometimes permanently or until higher level mathematics is made available to them.

Cuisenaire rods (available from www.etacuisenaire.com and most teacher supply stores) can be used to demonstrate math problems from simple addition and subtraction through algebraic equations. Borenson and Associates produce a great set of manipulatives for understanding algebra called Hands-On Equations©. You use a visual balance to shift parts of an

equation to one side or another and then solve for a solution, or "x." By maintaining balance, literally, your students *see* how algebra works. Look for or create more ways to *show* math and you'll engage every learner in your room.

Creating a Visual-Spatial Classroom

If you've found the tips in this mini-book helpful in teaching the times tables to your students, I invite you to look into *The Visual-Spatial Classroom: Differentiation Strategies that Engage Every Learner* for visual-spatial teaching strategies on other subjects. Or, visit www.visualspatial.org for tips and techniques from teachers all over the world.

School will probably be the only time visual-spatial students feel they are not as bright or capable as their auditory-sequential friends. Beyond this time, in college and in the careers they choose, these children will grow to feel the strengths of their right hemispheres are truly a gift. In creating a visual-spatial classroom, you can help them understand their gifts earlier and enjoy success in so many areas beyond the Three R's of 'ritin', readin' and 'rithmetic. Be their cheerleader, their mentor, and the adult in their lives, other than their parents, that truly cares about them. The strong emotional bond many visual-spatial students feel about the one teacher that truly understood them lasts their entire lifetime.

Be that teacher.

About the Author

Alexandra "Allie" Golon is Director of the ***Visual-Learners.com*** in Erie, Colorado. As a founding member of the Visual-Spatial Resource Access Team, a former G/T teacher and homeschooling parent to two visual-spatial learners, Allie brings a wealth of experience to her books, *Raising Topsy-Turvy Kids: Successfully Parenting Your Visual-Spatial Child; If You Could See the Way I Think: A Handbook for Visual-Spatial Kids* and *The Visual-Spatial Classroom: Differentiation Strategies that Engage Every Learner*. Allie has been invited to present on parenting and teaching visual-spatial learners at state, national and international venues. She has counseled dozens of families regarding various homeschooling issues and harmoniously parenting visual-spatial learners and has appeared on talk radio programs and in print media. Allie can be reached at Allie@Visual-Learners.com.

What people are saying about Allie's work with visual-spatial learners:

From a participant in the If You Could See the Way I Think children's workshop in Melbourne, Victoria, Australia:

Dear Allie,
The things I learnt at your presentation I did not know before. It helped me understand why I'm bad at maths. It made me feel special. Thank you for helping me realize who I truly am.

From a parent who attended a Raising Topsy-Turvy Kids seminar in Christchurch, New Zealand:
First time in a long while that I have sat totally mesmerized…thank you so much.

From a consultation client in St. Louis, Missouri:
I just wanted to say thanks for all your help and suggestions! It's amazing to me that I have been to multiple doctors... Psychiatrists, Psychologists, Neurologists and Pediatricians for 6 years now to try and get some help for J, not to mention the thousands of dollars we have spent trying to get some answers and after a 1 hour phone conversation with you I feel like I FINALLY have some answers! THANKS SO MUCH!

From a public school district in Edmonton, Alberta, Canada
Your sensitivity and perceptiveness are so evident. You are so in tune with people. Thanks for sharing your wisdom and warmth with us.

Nothin' But the Facts!

A Visual-Spatial Strategy for the Times Tables

Nothin' But the Facts was originally published as a chapter within *The Visual-Spatial Classroom: Differentiation Strategies that Engage Every Learner.*

The techniques outlined within these pages help *every single student*—regardless of preferred learning style!

To learn more about the visual-spatial learning style, or for information on other books in our series for visual-spatial learners, presentations and consultations, please visit the ***Visual-Spatial Resource*** at www.visual-learners.com