Math Puzzles

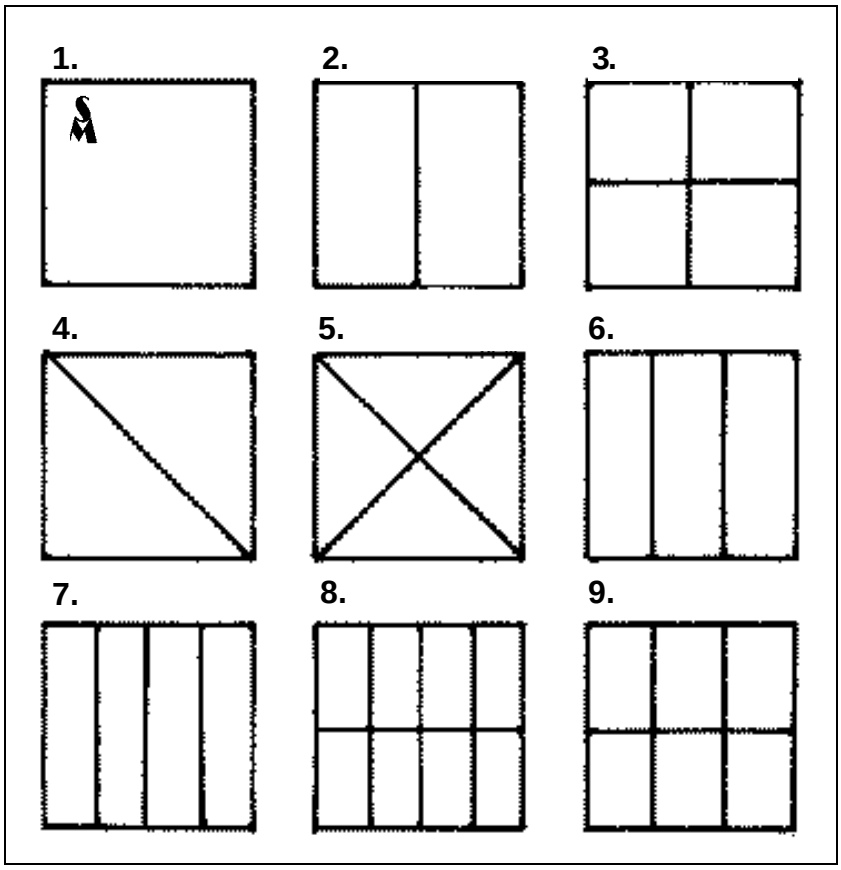
There are many different learning styles for math and I would like to discuss memorization versus concept learning. From early on we have a tendency to teach math by way of memory. We flash numbers and answers at the children for them to memorize, instead of making sure that they have grasped the concepts. Sooner or later they will have a difficult time understanding when memorization becomes too difficult.

If you thought that children were just playing, then I hope I'll be able to change your mind with this chapter.

Our son Marc has just graduated with a Master's degree in Engineering and is now studying for his Doctorate. It was always his goal to understand every concept. He was only satisfied if he could get to the root of the problem and understand all the different steps. Most of his classmates would work through memorization. They would memorize certain steps from one example and apply it to another problem. Marc always wanted to understand each step and then work through problems that way. If the teacher would allow cheat-sheets, Marc would just put a few guidelines for each step while some other students would cram as much as they could onto one page.

I wonder how a style of learning affects a school, country or industry?

For very small children, I believe strongly that hands on concept learning is essential and easy to do by exposing the children to the right toys. The earlier you train them to have the right thinking processes, the better. In my earlier teaching years, I was always very frustrated with the parents of preschoolers (3 and 4-year-olds). They always thought that if the child didn't learn numbers and letters, the preschool was no good. Finally, I designed a "toy for the parents" where I could show what children learn as they play. It was such a hit and right away the parents realized what good toys can do. I would show them the different learning corners and explain what each one was able to teach. They got quite excited! We would always have corners set up with early science, literature, dramatizing, art, math, music etc. For me, setting up these different areas was always a joy. It was very satisfying to watch the children playing or working in the different areas. I would almost get overwhelmed with excitement when I realized how their minds were working and all the new things that they were able to learn.



If we expose children to a lot of hands on concept learning, we do not have to teach them numbers and letters very early. We can wait until they show interest themselves. When they come to Kindergarten (five-year-olds), the foundation for learning will be set and learning will be easier.

Here is my math toy box
"For the parents:"

The Nine-Layer Puzzle Box

The nine-layers are all identical squares cut from 1/4" plywood. Each square is cut up into geometrical shapes and painted with one color, so the children know which pieces belong to which square. I usually use bright colors for each square. Because the squares are all on top of each other, the first thing a child will learn is that they are all the same size. As they play, they will see that number 2 and number 4 both have two pieces. Here they will learn that something can have the same area, but a different shape. These would be the pieces called halves. Squares 3, 5 and 7 have four pieces. Here again, they learn that each piece has the same area, but a different shape and is called a fourth. Soon after, they will see that two pieces from square 3 or 7 would be the equivalent of one piece of square two. The same will happen with squares 4 and 5, etc.

Without knowing numbers, a child will learn concepts. Early steps for adding are hidden in this toy (2+2, 3+3, 4+4, ½ + 2/4), and ultimately also multiplication and fractions (1 x 4 =4, 2 x 4 = 8, 4 x ¼ = 1), etc. Having these concepts, a child will know exactly what the teacher is teaching in grade one and later in geometry and multiplication. Children can see it in their minds and feel it in their hands. This is getting them off to a good start.

P.S. The math puzzle box is the same size as the Goldilocks and the 3 Bears puzzle box.