Case Study #4: Jeanine

Jeanine has just begun the ninth grade and is taking Algebra for the second time. She's always been well-behaved and compliant in class, but she is still as confused as ever about the math and has given up. She doesn't even bother to bring her book home any more. Jeanine's a marvelous writer who has already decided she wants to study English in college. Nevertheless, she treats algebra as a non-issue. Her parents know it's a hurdle she can't ignore.

A math evaluation test revealed that Jeanine never effectively learned her times tables. She understands the concepts but frequently has to add numbers of nines, eights, etc., to find the answers she's looking for. While she understands the step-by-step procedure for solving long division questions, her multiplication deficiency at best slows the process. At worst, when divisors have more than one digit, she becomes completely lost.

This deficiency has further resulted in only partially learning fractions and decimals. Thus, it's not surprising that algebra is so difficult. Although she's a great reader with excellent analytical abilities, Jeanine has not learned the specific skills necessary to decode math word problems. Jeanine's difficulties have less to do with the complexities of algebra and more to do with her misunderstanding of basic mathematical knowledge.

A conference with Jeanine made it plain that her pride would not allow her to take a remedial class offered by her school. "I'm not one of those kids," she said. Not wanting to further damage her self-esteem, Jeanine's parents reluctantly support her position.

After explaining to Jeanine and his parents that it would take about a school year of daily instruction in a regular classroom to bring her skills up to beginning algebra competency, we had to negotiate the number of days during the week for instruction. Jeanine was then provided with carefully planned direct instruction and specific assignments for reinforcement.

I showed Jeanine that she already knew at least half the times tables and would only have to learn only parts of the other half. I also showed her that many of the half she didn't know were just the opposite of the ones she already knew, for example, 3 x 6 = 18 and 6 x 3 = 18. Additionally, I demonstrated the lattice algorithm, a technique for multiplying multiple digit numbers that didn't involve carrying. None of these brilliantly conceived lessons had their expected effect. Previous failures and their humiliation had taken their toll. Jeanine dug in her heels and refused to do the necessary memory work. She did reveal that she was sure she could learn algebra without the pain of multiplication.

Since it was such an emotional issue for Jeanine, I recommended that we work at plugging every gap in her mathematical knowledge that we could without stressing multiplication. My plan was to gently steer her to her frustration point.

Working through a K-8 review text, Jeanine discovered that she was stopped cold at every topic when multiplication was needed. She recognized that finding the lowest common denominators of fractions, their decimal equivalents, or the areas of rectangles

were not intellectual challenges. The answers, however, continued to elude her when she became bogged down by substituting repeated addition for multiplication. When the length was 16 feet and width 9 feet, Jeanine found she had to either add sixteen nine times or add nine sixteen times. Without nagging, I often showed her how multiplication simplified such problems and revealed the answers

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Jeanine found she could learn a lot of procedures even with complicated work arounds that didn't involve multiplication. Slowly, she began to accept that the limitations of his approach. After several months, the frustration of not getting answers Jeanine knew she should be finding, out-weighed the issue of learning multiplication. She then asked me to help her over that stumbling block.

Jeanine and I reviewed the multiplication she knew. I gave her small portions of the tables she needed to learn and retaught the lattice algorithm. Within three weeks Jeanine was able to return to the K-8 text. We quickly filled in all the knowledge gaps confirming the value of multiplication. The rest of the year was spent getting a leg up on algebra so she could take it in the tenth grade. Jeanine wasn't happy being the oldest student in the class, but now she saw the light at the end of the tunnel.