**Personal Statement**

As I strategized which moves to make next, my pudgy little eleven-year-old fingers dexterously slid the red and white tiles around the four-by-four frame. I glanced at my binary watch: 18 seconds (10010 in binary). Only two more rows to go. A grin slowly started to form on my face, stretching from one ear to the other. Right, left, up, down - my eyes grew wider as I continued to reposition the multicolored metal squares into their natural order. As I moved the “15” tile down to the last row, I instantaneously whacked the stop button on my timer: 29 seconds (11101 in binary). I solved the “15-puzzle” in just twenty-nine seconds, only four seconds off of chess grandmaster Bobby Fishers personal record! My first reaction was to run to the living room, pick up my phone, and call my best friend and puzzle-solving nemesis ×××, who I knew would be crushed when I told him that I had shattered his best time.

But something held me back. My pride was fleeting. Even eleven-year-old me understood that it wasn’t as if I had just proven Fermat’s Last Theorem. I had implemented preset algorithms that did little to develop my originality.

For the next three years, mathematics continued to be a mechanical exercise in memorization and repetition, detached from intellectual creativity or wonderment.

That changed one afternoon when, at fourteen years old, I discovered myself surfing [www.cut-the-knot.org](http://www.cut-the-knot.org), a website that provides an assortment of challenging puzzles to math enthusiasts. I had just rearranged a group of three-dimensional wooden pieces to form an octahedral shape, when my eyes shifted to a link on group theory.

Clicking on the hyperlink, I was reunited with an old friend that had been forgotten and cast off into my trunk of “infinitely many” toys. Apparently, the 15-puzzle’s tiles could be intricately categorized into different permutations using axioms of group theory. As I furiously scribbled down theorems and conjectures that popped into my head, one thought rose to the forefront of my mind: a puzzle that, at face value, had seemed so facile and elementary was actually packed with beautiful, intricate mathematical concepts. This was a seminal moment in my development as both a mathematician and a person, as I discovered the beauty of mathematics, not simply its functionality.

The presence of mathematical complexity in the quotidian fascinated me. The more I pondered this notion, the more connections I discovered between the realm of mathematics and the world in which I lived. My standard method of resolving disagreements in primary school - Rock-Paper-Scissors - is much more intricate when viewed through the lens of game theory. The earphones that get annoyingly tangled in my pocket during my weekend jogs can be perceived as a distinctive combination of knot theory and topological analysis. And the crumpled paper balls I constantly use to practice my free-throw skills are actually examples of complex rigid structures, as I discovered when I came across a paper called 'Three-dimensional structure of a sheet crumpled into a ball” while reading the American Mathematical Monthly.

As I continued to discover more links between seemingly bland concepts and elaborate mathematics, the connections only became more and more gratifying. Whether it is considering why, on average, my friends have more friends than I do, or contemplating the “bouncy” rhythms and motifs of Paul Hindemith’s “Tanz de Holzpuppen” (“Dance of the Puppets”), I always feel gratified when I apply mathematical concepts to answering real world questions. I no longer aim to mechanically rush through my endeavors, attempting to solve them in the least amount of time; I aspire to elevate them to a new level of understanding, providing a sense of fulfillment that can only be achieved through deeper exploration.

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