Block Party by Brad Carl Sam

How far can a tower of blocks hang over the edge of a table before it collapses? Like other apparently simple problems, the solution to the block stacking question is far from simple. In a singlewide stack, the problem must be tackled in a unique way. By approaching the problem from the top of the stack, rather than the bottom, one can calculate the relative overhang of each block with ease. One must merely find the center of mass in a single dimension. If half of the mass of the tower is safely resting on the table the tower will not fall. Thus, to calculate the optimal placement for a block, one must find the center of mass of the tower, and then place the next block such that half of the tower's mass is resting on the new block. If one consistantly places blocks in this manner, the center of mass of the tower can easily be located by dividing the length of the stack by two.
As one continues to add blocks to the stack, one can achieve an overhang of arbitrary length. Upon close inspection of the stack, an interesting relationship between the harmonic series and total overhang emerges. For a singlewide stack of n blocks, the maximum overhang is equal to half of the nth harmonic number. Since the harmonic series diverges to infinity as n grows, the maximum overhang for a singlewide stack is unbounded. Although the harmonic series diverges, it does so very slowly. The top block, which we will call the first block, goes out by 1/2, the second block goes out by 1/3, the third goes out by 1/4. For a 100 unit overhang, the minimum number of blocks required is greater than the number of particles in the known universe.
It is only natural for one to wonder if it is possible to obtain a larger overhang with the same number of blocks. One need only change the rules slightly. If multiple blocks may directly rest upon a single block, the maximum overhang increases drastically. When more freedoms are granted, the problem becomes incredibly complex. Finding the optimal stack for n blocks in a multi-wide stack requires a great deal of effort. The math involved in calculating the placement of blocks in an optimal stack quickly becomes collegiate level.

by Beverly

I really like how your project turned out. I think your display was really well done. I like how Sam painted the blocks of the optimal stack because it makes it easer to understand the counter weight.
Good Job

by Courtney

I saw the effort you put into these stacks, and the amount of learning you had to do to make these, and I'm really amazed by how it looks. The colors of your blocks contrast really well, and make it look even more interesting and easy on the eyes.