**San Joaquin Math Teachers’ Circle**

**February 18, 2015**

**Prime Climb**

This session uses the game Prime Climb, available from the Math For Love website at: <http://mathforlove.com/games/>

I had heard of this game through Kickstarter, when it was called “Primo.” I purchased one and the MTC purchased one. The game was finally released around late 2014.

Prime Climb comes with two 10-sided dice and the playing board has colorful spaces numbered 1 to 101.

The following describes how we used the game in our Teachers’ Circle.

1. We had the teachers play a simplified version of the game, in groups. We did not use the special instruction cards, and we used only one piece per player.  The only directions were:
	1. to roll the two dice and use those numbers to move your piece (using addition, subtraction, multiplication, or division – following the movement rules of the game), and
	2. to try to get your piece to land exactly on 101. (If you only use one die to get there on the last move, that is fine).
	3. [I did not mention the different colors on the game board at this point – though the question did come up. The spaces are colored according to their prime factorization.]
2. After they had played one or two rounds, we asked some questions.
	1. How many possible moves are there at the start?
	2. What is the largest number of different possible moves you could make with two dice from a point other than 0 or 1? Are there some numbers that have more possibilities than others? If so, which ones?
	3. What are some “good” numbers to be at near the end of the game?  From which spaces on the board is it possible to win on the next move?  (The teachers were pretty good at this one intuitively, though it can be tricky to explain.)
	4. How can the colors help you out?
3. This took us into the land of factors, and then prime factors, and we talked about the colors on the board.
4. We talked about the Sieve of Eratosthenes as a way to determine primes. Then we asked: How many steps of the sieve must you do to guarantee that the remaining spaces on the board must be prime? Teachers can study this from 1 to 100, though it is a good problem to simplify – say 1 to 10, or 1 to 16, etc. Then we posed the question of finding primes from 1 to *n*. [The teachers had a more difficult time coming up with sqrt(*n*).]