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## SAT Math: A Game of Sequence



by Cindy Donaldson

Recognizing number patterns is an important ability, on the SAT and for life in general. And, lucky for your high school child, there are a handful of sequences that show up frequently, both in nature and on standardized tests. By becoming familiar with them, your student can save time in the future. Here's a game that teaches your student some of the most common sequences in mathematics.

### What You Need:

- A copy of the sequences at the end.
- An incentive if your student wins the game (optional)

### What You Do:

1. Tell your student that you're going to play a guessing game to see how fast he can figure out number patterns. You're going to tell him the first two "terms" of the pattern, and see if he can guess the next. If he can't, you'll tell him another term, and he can guess again. He'll get more points the earlier he can figure it out, with extra points for being able to describe the pattern with words. (If he can score enough points, he may earn an incentive of your choice.)
2. Tell your student the first two numbers in the pattern. If he can guess the third number, he gets 3 points.
3. If he gets it wrong, state the third number. If he can guess the fourth number right, he gets 2 points.
4. If he gets it wrong, tell him the fourth number. If he can guess the fifth number, he gets 1 point. If he still can't guess it, he gets no points. Help him figure it out.
5. Ask him to describe the pattern. If he can describe the rule in words, he gets 2 points.
6. Repeat with the other patterns.
7. When you're done with the patterns, add up his points. If he got more than 25 points, he has won! You can reward him with a high five, or with something more inspiring like one chore "pass" for the next week.

**Sequences:**

2, 4, 6, 8, 10 ... “Multiples of 2”

1, 4, 9, 16, 25 ... “The squares:  $1^2, 2^2, 3^2, 4^2, 5^2$ , etc.

1, 8, 27, 64, 125 ... “The cubes:  $1^3, 2^3, 3^3, 4^3, 5^3$ , etc.

5, -10, 15, -20, 25 ... “Multiples of 5, with alternating signs.”

4, 12, 36, 108, 324 ... “Multiply each term by 3”

1, 1, 2, 3, 5 ... “Add the previous two terms (Fibonacci)”

1, 2, 4, 8, 16 ... “Powers of 2:  $2^0, 2^1, 2^2, 2^3, 2^4$ , etc.”

$3x + 1, 6x + 2, 12x + 4, 24x + 8, 48x + 16$  ... “Double the previous term.”

1, 2, 2, 4, 8 ... “Multiply the previous two terms.”

**Extension:**

If your student is a visual learner, you may want to copy the patterns using large writing. That way, you can unveil the numbers one at a time for him to see, in addition to hearing them.

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