I'm Not So Sure Anymore **Name:**
Activity 2 **Date:** **Hr:**

By counting the number of outcomes in small sample spaces, you may observe some patterns that can help you determine the size of large sample spaces.

In one simple lottery, players select 1 number from the set {1, 2, 3}. The sample space for this lottery contains 3 **singles**:
{1, 2, 3}

If players had to select 2 numbers from the set {1, 2, 3}, the sample space contains 3 **pairs**:
{(1, 2), (1, 3), (2, 3)}.

If players had to select 3 numbers from the set {1, 2, 3}, the sample space contains 1 **triple**:
{(1, 2, 3)}

Exploration
Complete the following table:

Numbers for Lottery	# of Singles	# of Pairs	# of Triples	# of Quadruples	# of Quintuples
{1}					
{1, 2}					
{1, 2, 3}					
{1, 2, 3, 4}					
{1, 2, 3, 4, 5}					
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}					

Discussion:
1) What patterns do you observe in the spreadsheet?

2) How did you complete the spreadsheet?

3) What does the number in each cell represent?

Examples:

1) Determine the **size of the sample space** when playing a lottery in which 3 different numbers are picked from the set {1, 2, 3, ..., 20}?

2) Determine the theoretical probability of winning a lottery in which 5 different numbers are picked from the set {1, 2, 3, ...15}?

Practice:

1) What is the theoretical probability of winning a lottery in which you select 3 numbers from a set of 1-40?

2) In a state lottery, players chose 4 different numbers from a set of 22. To win the jackpot, players must match all 4 numbers.

   a) What is the probability of winning the lottery with 1 ticket?

   b) What is the probability of winning the lottery with 10 different tickets?