

Exploring and Making Conjectures: Patterns in the Multiplication Table

Math 210, C. Wells

Fall 2013

Objective

THE LEARNER WILL **explore** a numerical situation, look for patterns, and make and effectively **communicate** predictions or **conjectures** about the observed behavior.

Procedure

Using the (partial) multiplication table shown below, determine how often each of the numbers 1 through 25 would appear *as a product* in a multiplication table (assuming the table continued indefinitely in each direction).

\times	1	2	3	4	5	6	7	8	9	10	11	12	...
1	1	2	3	4	5	6	7	8	9	10	11	12	
2	2	4	6	8	10	12	14	16	18	20	22	24	
3	3	6	9	12	15	18	21	24	27	30	33	36	
4	4	8	12	16	20	24	28	32	36	40	44	48	
5	5	10	15	20	25	30	35	40	45	50	55	60	
6	6	12	18	24	30	36	42	48	54	60	66	72	
7	7	14	21	28	35	42	49	56	63	70	77	84	
8	8	16	24	32	40	48	56	64	72	80	88	96	
9	9	18	27	36	45	54	63	72	81	90	99	108	
10	10	20	30	40	50	60	70	80	90	100	110	120	
11	11	22	33	44	55	66	77	88	99	110	121	132	
12	12	24	36	48	60	72	84	96	108	120	132	144	
\vdots													

Questions

- What patterns do you notice in how often numbers appear?
- Do you have any ideas about how you might predict how often a given number would appear in the table?
- What other questions do the patterns raise for you? What else would you like to know?