

## Patterns in Multiplication

**Companion Text:** If You See the Moon, by Zia Wells

**Subject Area & Grade Level:** Mathematics, 3<sup>rd</sup> Grade

**Materials:** Scissors

### Objectives

After this lesson, students will be able to:

- Demonstrate increased understanding of multiplication
- Identify patterns in an array of numbers
- Use words to describe mathematical concepts

### Activity

Read the story once through without stopping. Ask students whether or not, they would like to go to the moon someday. Ask, how do people get to the moon? (Fly a space shuttle). Explain that flying a space shuttle requires an extensive understanding of math and science, as well as patterns that numbers make.

Break up students into groups of 3 or 4. Give each group twelve sheets of paper and a pair of scissors, and have them cut each paper into twelve equal rectangles, creating a total of 144 pieces of paper. You can demonstrate how to fold the paper to achieve this. (Fold it in half, then in half again, and then fold the remaining piece into thirds.) Have students use these papers to write the 144 products that are the multiples of 1 through 12, up to  $12 \times 12$ .

Then, ask each group to arrange their 144 rectangles into a pattern on the floor, organized in any way they choose. The only rule is that all rectangles must be visible (that is, no papers can be placed on top of each other).

### Reflection

Have each student make a list of at least three patterns they can find in their array. Then, pass out the attached multiplication table, and discuss the patterns found in it, such as the diagonal made by the squared numbers, correspondence between rows and columns, the size of numbers increasing from the top left to the bottom right of the array, etc.



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

