Pattern Machine

The Pattern Machine is a modified Multiplication Machine, which you can buy from Lakeshore Learning for about $20. Often, you can find used ones at thrift shops. We modified ours using 3M 15mm Washi Tape.

There are three main activities with the Pattern Machine that have arisen from watching children play with them: drawing, patterning, and counting. Each of these is described briefly, together with suggestions for talking and playing together with your child.

Drawing

After punching the buttons up and down for a while, children tend to enjoy making lines. Vertical and horizontal lines come first. Then diagonals. They draw squares, rectangles, and triangles. All of these involve young children in imagining relations in space, and in planning ahead.

Patterning

What does the machine look like if you go across the rows, from top to bottom, following each of these patterns?

1. Down-up, down-up, down-up, …
2. Down-down-up, down-down-up, …
3. Down-down-down-up, down-down-down-up, …
4. Down-down-up-up-up, down-down-up-up-up, ...

What other patterns can you make? Why do you think they make the machine look the way they do? How would they look different on a different-sized machine?

Counting

The simple question *How many buttons are up?*, followed up with *How do you know?* can create interesting conversations quickly. Each of the configurations on the next page often generates multiple methods of counting (see example for the first configuration).

Make sure to listen to each other's ways of counting, and to look together for different ways to get the same answer.

(Search "multiplication machine" on *talkingmathwithkids.com* for examples of the kinds of math talk these toys can initiate.)
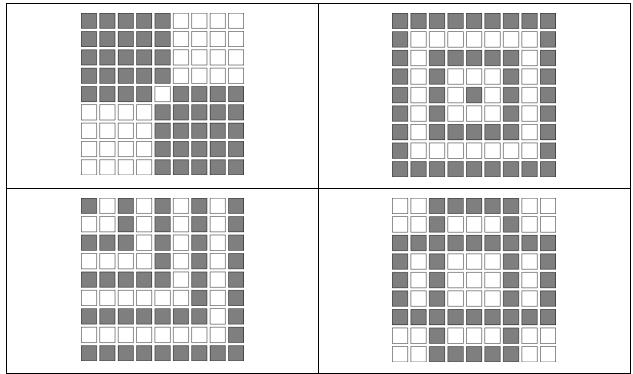
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An example of counting in different ways

In all examples dark squares are up; light ones are down.

There are two lines of 9, but the middle one is counted twice, so 2×9–1.

The vertical line has 9 buttons up. Then there are 4 up buttons on each side, so 9+2×4.

There are 81 total buttons. The down buttons are in 4 sets of 16. The rest are up. So 81–4×16.

There is one button up in the middle and four arms of four buttons coming off it, so 1+4×4.

Some more useful configurations for good counting

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