

Unit Task: “__World of 90°_”

The notation, $\{1 * 2\}$, means to draw the design you can make by repeating “move forward 1 inch, turn right 90° , move forward 2 inches, turn right 90° .” So, $\{1 * 2\}$ will result in



We can change the numbers inside $\{ \}$ in different ways to draw different designs.

(a) Draw $\{2 * 1\}$, $\{3 * 6\}$ and $\{1 * 4\}$.

(b) In addition to changing numbers inside $\{ \}$, we can also change the number of numbers in $\{ \}$, too. Draw $\{1 * 2 * 3\}$.

(c) Investigate other designs you can make by changing the numbers inside $\{ \}$ in different ways.

Discussion, Suggestions and Possible Solutions

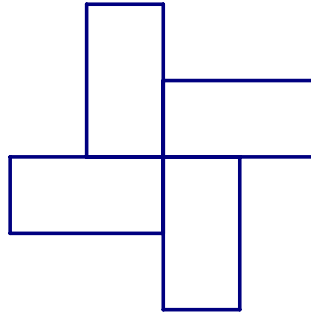
*$\{2 * 1\}$ will result in the same design as $\{1 * 2\}$ except it will be turned around 90° .*

*$\{3 * 6\}$ will result in a similar rectangle as $\{1 * 2\}$, with each side tripled.*

*$\{1 * 4\}$ will result in a rectangle with the dimension, 1 unit by 4 units.*

*$\{1 * 2 * 3\}$ will result in the design below::*

Started here →



Patterns students might notice:

- *changing orders in { } does not change the resulting design – though they may be rotated*
- *when there are 4 numbers inside { }, the design is unending*
- *when the number of numbers inside { } is a multiple of 4, the design is unending*
- *etc.*

Extension:

World of 45°.

Let's say <1 # 2> to mean the design you can make by repeating “move forward 1 inch, turn 45°, move forward 2 inches, 45°.” Determine what design you can make with <1 # 2>. Then, have students explore other possible combinations.

World of 36°. Instead of turning 45°, turn 36°.

Some people may be familiar with a computer software called Logo. These tasks are very similar to “turtle geometry” we can investigate with Logo. One difference is how the turn angle is measured. With Logo, the angle of turn is measured between the original heading and the new heading as shown.

