

A Description of the Algorithmic Recipe for this Sculpture

(Also available in the catalog and at momath.org)

To begin with, a rule is established to limit the types of actions that can be performed: orange pipe cleaners will only be allowed to twist and join with other oranges, and greens with other greens. This means that two independent networks will come to comprise the sculpture, one orange, one green. The orange network and the green network will snake back and forth between each other, helping organize each other, and stabilizing each other, but never actually connecting.

With this rule in hand, an experimental weaving pattern can now be intuitively explored. Given that six identical sites surround the 'seed' at the core of the structure, a move (either a specific cross and twist, or a pipe cleaner addition) can be devised for one of the six sites and then simply repeated at all five of the others. This keeps the focus of one's attention very contained and local, and simplifies decision making while figuring out the pattern. Furthermore, all activity happens on the rim of the sculpture, so all attention is concentrated there. Specifically, attention is paid to the order of alternating orange and green pipe cleaners as they dot along the rim, and to how that order changes as crosses and twists get made and new pipe cleaners added. For instance, at one moment the order arrived at will consist of:

2112112112112112112112112112112112112112112112

and so on (which is to say, two orange pipe cleaners followed by one green, then one orange, then two green, and so forth) until that order makes its way all around the perimeter and reconnects at the point where it started, forming a ring. At that particular moment, each double orange has a single green to both its sides, and vice versa: each double green has a single orange to both its sides.

Whenever that particular repeating order occurs, it is decreed that new pipe cleaners be added in both colors, following the rule that each add must first be folded in half to make a V. The crux of the V then has to be targeted between the doubled pipe cleaners of its color, whereupon the two sides of the V span left and right, skipping

over the neighboring singles of the opposite color. Then, each end of the V gets twisted to join with the singles of its color one more neighbor down, which causes those singles to become doubles. Once such an add has been targeted at each initial double, all of the initial singles turn into doubles and the order becomes:

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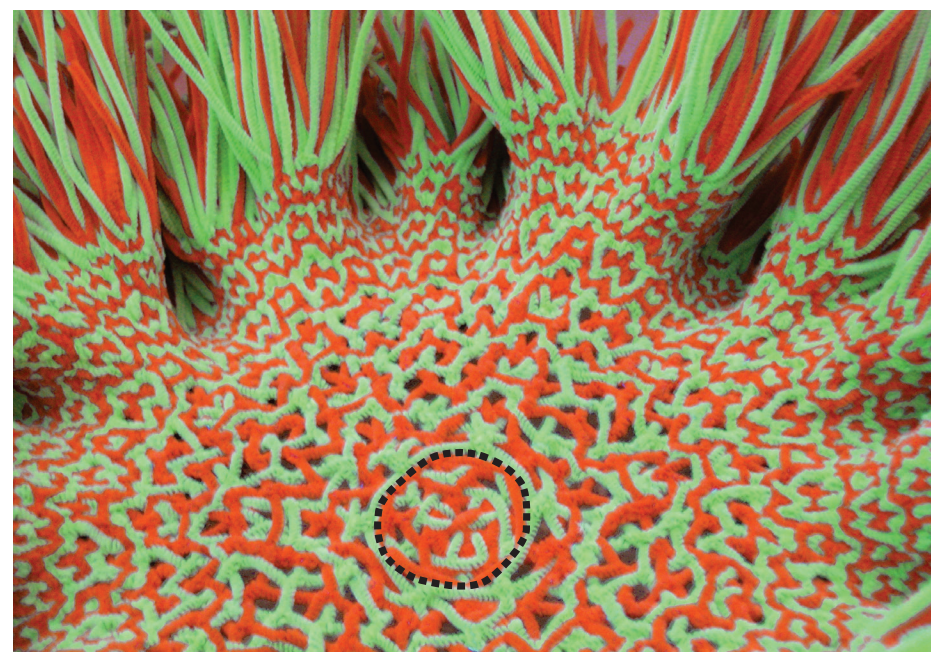
(which is to say, doubles repeating all the way around the new perimeter).

Over the course of the sculpture, other orders occur as well, each with an internal repetition like the two mentioned above, with the repeating segment always bilaterally symmetric. Such repeating segments from other patterns include:

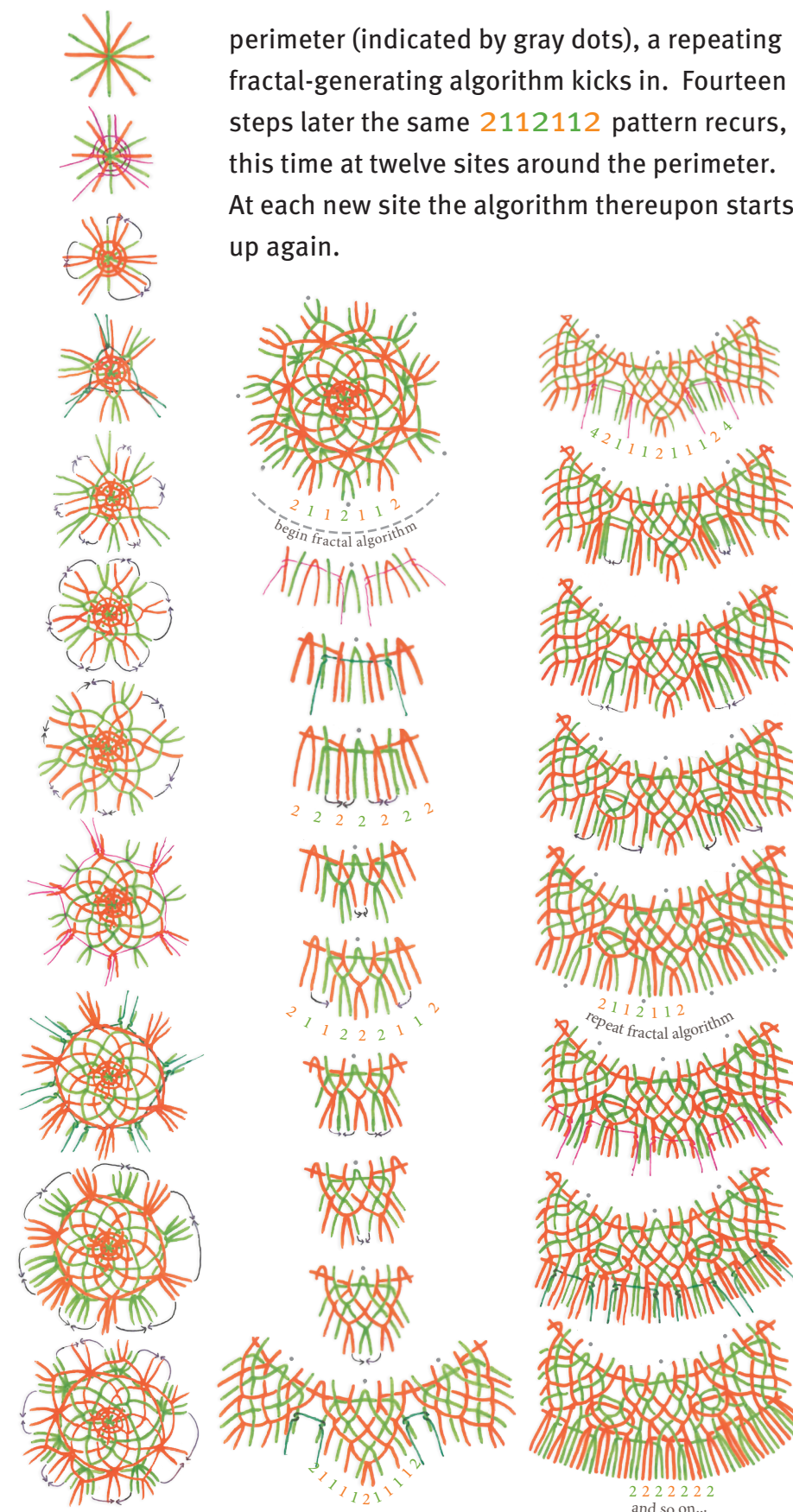
...2 1 1 2 2 2 1 1 2...

and ...2 1 1 1 1 2 1 1 1 1 2...

and even ...4 2 1 1 1 2 1 1 1 2 4...



As can be seen in the diagrams that follow, the core, as it were, consists of twelve steps, at which point the structure reaches a threshold, indicated above by the circle of dashes. At that stage, when the order has reached 2112112 at six sites around the



perimeter (indicated by gray dots), a repeating fractal-generating algorithm kicks in. Fourteen steps later the same 2112112 pattern recurs, this time at twelve sites around the perimeter. At each new site the algorithm thereupon starts up again.