Let’s play a game!

Using a triangle and a random point in the plane, we will play the chaos game.

1. Choose a starting point (seed) anywhere inside the triangle (it could actually be anywhere in the plane).
2. Assign colors to the numbers in the die as follows: 1 and 2, 3 and 4, 5 and 6.
3. Roll the die!
4. Find the midpoint between the starting point and the vertex indicated by the roll of the die, color this midpoint with the same color of the corresponding vertex.
5. This midpoint becomes the new starting point.
6. Repeat steps 4 to 6... Forever!

Predict what the pattern will be after several hundred rolls of the die.

Do you think that any point in the triangle has a chance of being filled at some step?