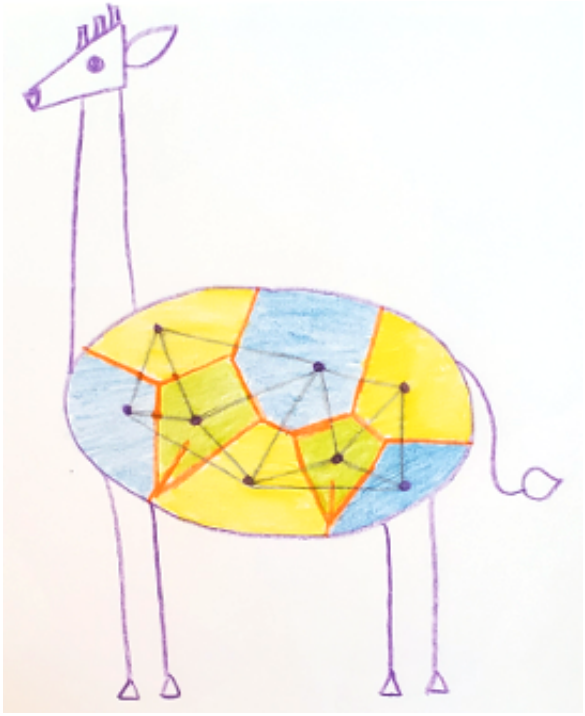
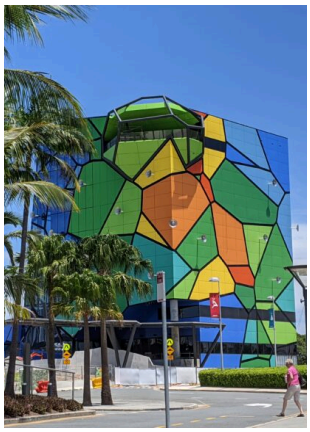
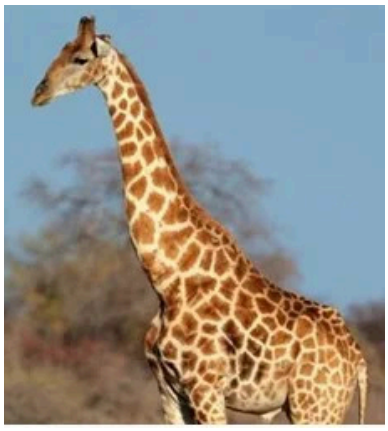
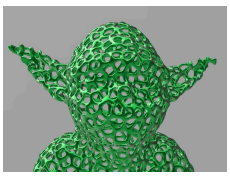
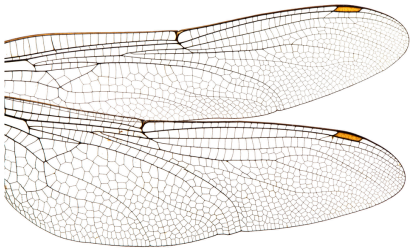


Making and Exploring Voronoi Diagrams

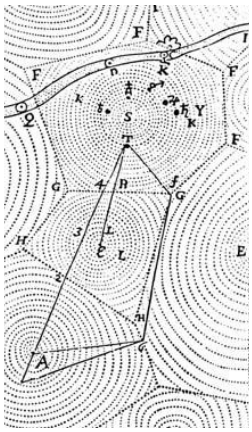


Image references: MathHappens; photo collages by Francesco S. Bellelli and Erick Lumunge; "Dingo Dreaming" painting by Warlimpirrnga Tjapaltjarri from Kiwirrkura, at the National Gallery of Victoria; René Descartes diagram (published in 1644); Home of the Arts Centre Gold Coast, Australia; 3D Yoda by dcfrizzle on Thingiverse; Floral Voronoi II quilt by Andreia Hall & Prudência Leite; Natural Math giraffe sketch

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Math Makers Guide Checklist

Pathways

#51 Geometry
#52 Convex and Discrete Geometry
#68 Computer Science ⇒ U05 Computational Geometry

Math Makers Circle is an informal learning space where participants make mathematics accessible to everyone in kind ways. Everyone makes a mathematical object in their own way and helps math friends to make theirs. And then what? Pathways from the international Mathematics Subject Classification is where we can go from there: https://msc2020.org/

Make and Explore

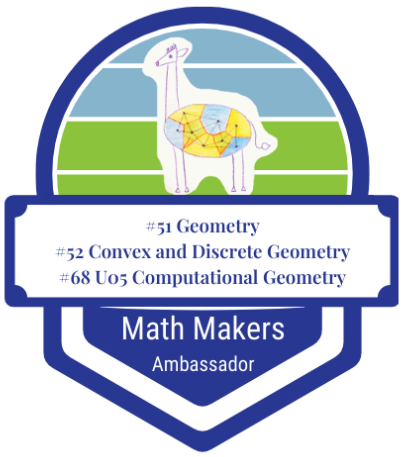
What are we making? Models and art with **Voronoi diagrams**. To make Voronoi diagrams, we **partition** an **area** into **polygons** by **edges** and **vertices** in such a way that every point of each region is closest to a special **generating point** within that region. To make our diagrams, we walk, fold paper, draw, and code.

What are we exploring? The shape, size, and position of our Voronoi polygons and good algorithms for making them. We choose our area, our number of generating points, and where to put them. We look for similarities and differences in resulting Voronoi patterns. We research which choices lead to better art and useful fabrication.

Any spoilers? Yes! Grow your math eyes and notice minimal distances, triangles and quadrilaterals, bisectors, perpendicular lines, convex and concave polygons, and circumcenters.

Gear Check

Paper, colored pencils, a camera. Optional: chalk/markers (to draw on the floor), cord/yarn, sticks.



Ambassadors

How to become an ambassador? Participate in a math maker circle with experienced organizers. Then help another person make their own Voronoi models and art. Share your creations and your ideas.

Share and Publish

Send your creations, stories, and questions to reach.out@naturalmath.com or text 919-388-1721. We answer every message.

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