

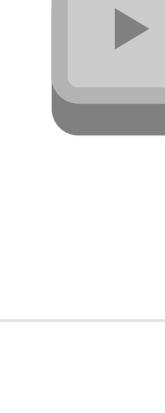
Beautiful Geometry

Fall in love with geometry by uncovering elegant solutions to beautiful geometric problems.

35 Lessons

1 Introduction

Start



Infinite Areas



Polyomino Tiling



Guards in the Gallery

2 Tessellations and Reptiles



Regular Tessellations



Semiregular Tessellations



Transforming Tiles Part 1



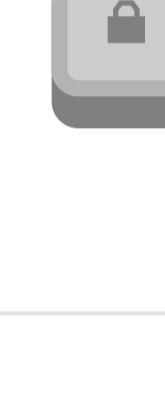
Transforming Tiles Part 2



Irregular Tiles



Reptiles



Infinite Arithmetic

3 Polyominos



Tiling a Chessboard



Counting All Possible Solutions



Bigger Polyomino Blocks



Challenging Packing Puzzles



X-Only



Tiling and Cutting



Congruent Cutting

4 Folding Puzzles



Mathematical Origami



Dragon Folding



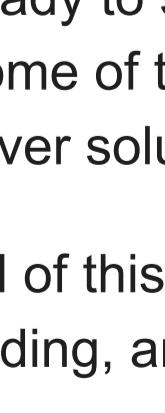
1D Flat Folding



2D Holes and Cuts



2D Single-Vertex Flat Folding (I)

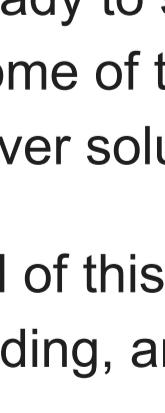


2D Single-Vertex Flat Folding (II)

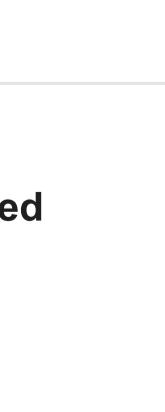
5 Guarding Galleries



Strange Polygons



Convex vs. Concave



Quadrilateral and Pentagonal Galleries



Efficient Guard Placement



Worst-Case Designs



Fisk's Coloring Proof



Further Art Gallery Research

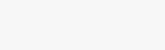
6 Pick's Theorem



Pegboard Rectangles



Pegboard Triangles



Pick's Theorem Generalized

Pick's Theorem With One Hole

Pick's Theorem With Multiple Holes

Course description

Are you ready to start loving geometry? This course is here to guide you through some of the magic of geometry, revealing the thought processes that lead to clever solutions to beautiful geometry problems.

By the end of this course, you'll have explored polyominoes, tessellations, origami folding, art gallery problems, and lattice polygons.

Topics covered

Convexity and Concavity

Pick's Theorem

Deconstructing

Polyominoes

Origami

Reptiles

Fisk's Coloring Proof

Tessellations

Fractals

The Art Gallery Problem

Lattice Polygons

Triangulation

Packing Puzzles

Prerequisites

Geometry Fundamentals

Next steps

Geometry II