

Pollinator Architecture: Structure & Geometry

Grades 4 - 9

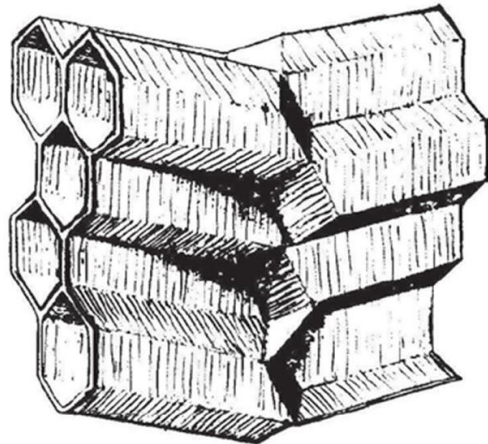
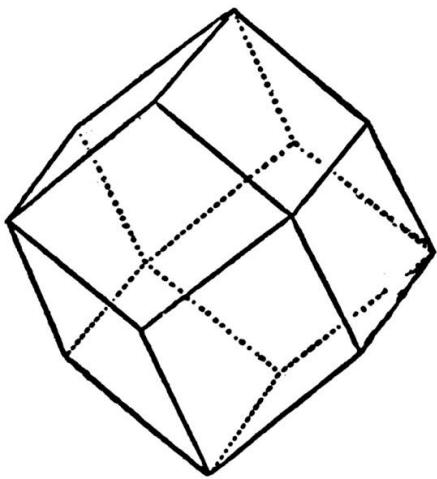
The wax-made comb of the honeybee is a masterpiece of animal architecture. The highly regular, double-sided hexagonal structure is a near-optimal solution to storing food and housing larvae, economizing on building materials and space.

Big Idea:

Tiny creatures have the capacity for large scale impact..

Big Questions:

*What can honeycomb geometry teach us about lightweight, cost effective material efficient structures?
What can the honeybee architect teach us about simplicity and complexity in design?*



Learning Objectives:

- To understand the 3D geometry of a honeycomb structure.
- Create unique structures by using multiple honeycomb cell structures

Materials needed

- 8.5"x11" paper / cardstock, scissors, glue stick, clear tape
- Print out templates, on cardstock if available

Activity Plan

The basic honeycomb cell: (30min)

- Print templates for 7 starter cells
- Score, fold, and glue the large piece into a hexagonal tube to form the cell walls.
- Glue the tabs of end cap to the inside of the cell walls.
- Glue the cells together to form a honeycombe.

Design your own unique structure using the honeycomb structure as inspiration: (45+ min)

- Look at the examples for inspiration.
- For whom / where will your design theoretically be located?
- What could a 'hive' inspired ... school / office / playground / house / factory / hi-rise look like?

Sharing

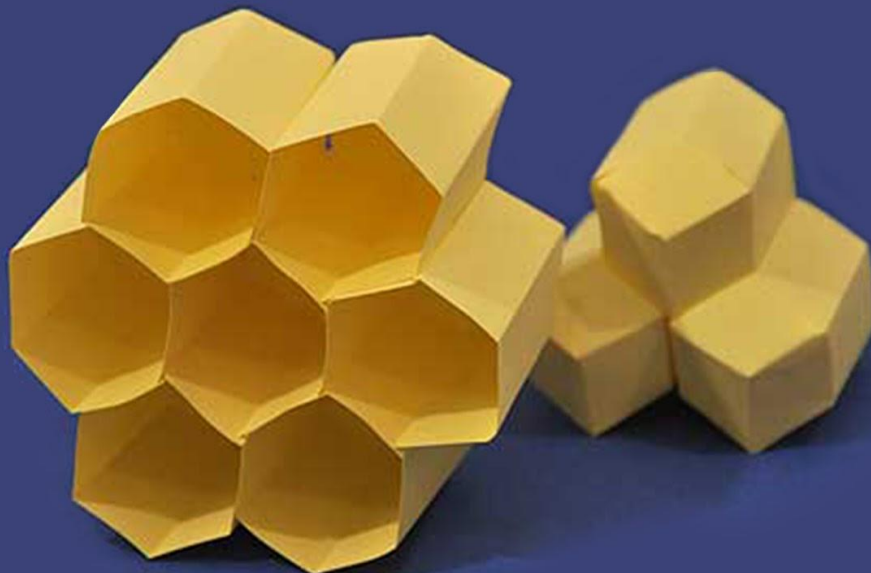
Take 3 photographs

- 1x of our assembled base comb cells
- 1x of your sketch for / process of your unique honeycomb architecture structure.
- 1x of your final hive inspired drawing/ model for a school / office / playground / house / factory / hi-rise.

Share your images on your class' 'Project Board Google classroom.

The project starts with the basic beehive cells.

The main objective is to create your own drawings or models that use this base form to create unique architectural structures!

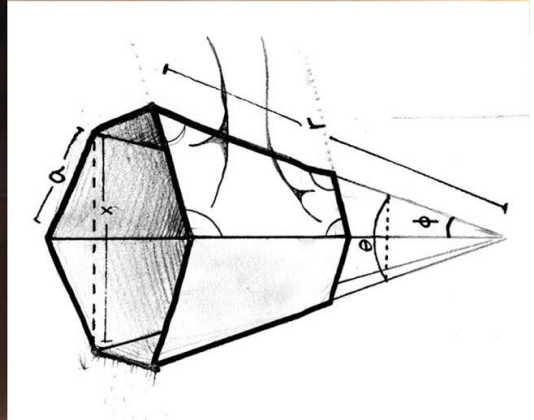


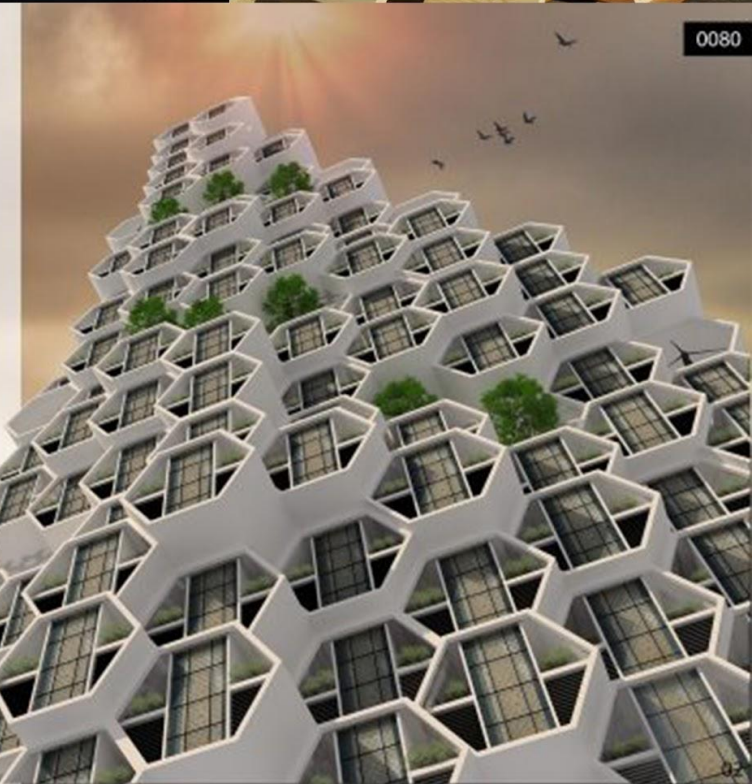
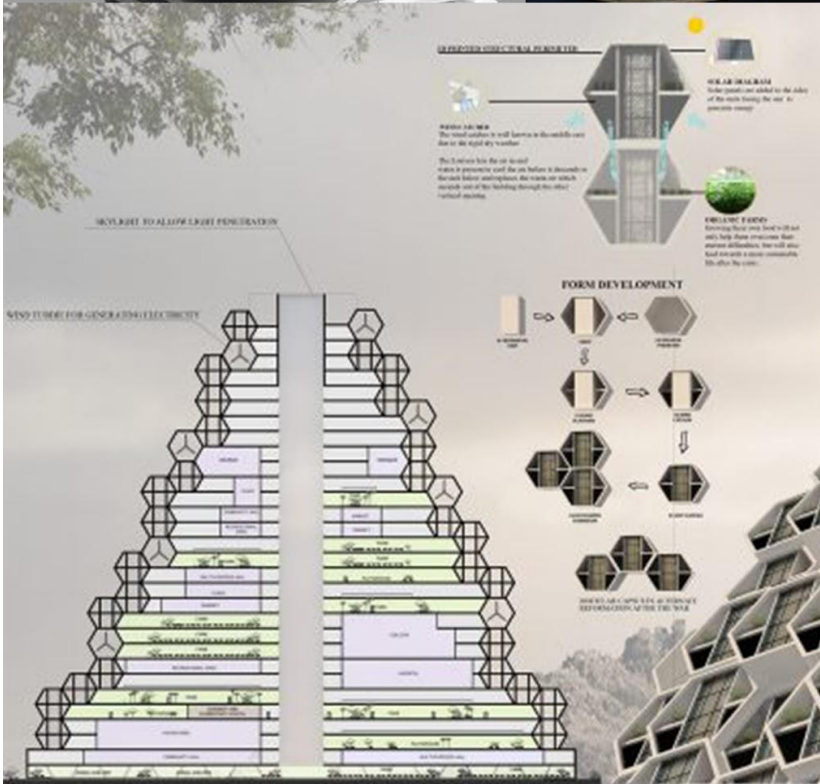
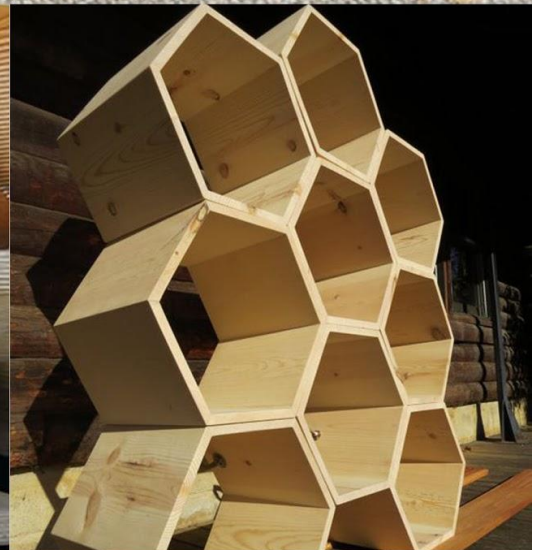
Bees create arrays of hexagonal cells in a beehive. However, the shape of each cell is not a hexagonal prism as you might expect because the bottoms of the cells are not flat. Bees make two layers of comb back to back. The two layers are offset so that the center of a cell on one side lines up with the point where three cells meet on the other. In this arrangement, the ends of the cells form half of a rhombic dodecahedron!



**One base
geometry**

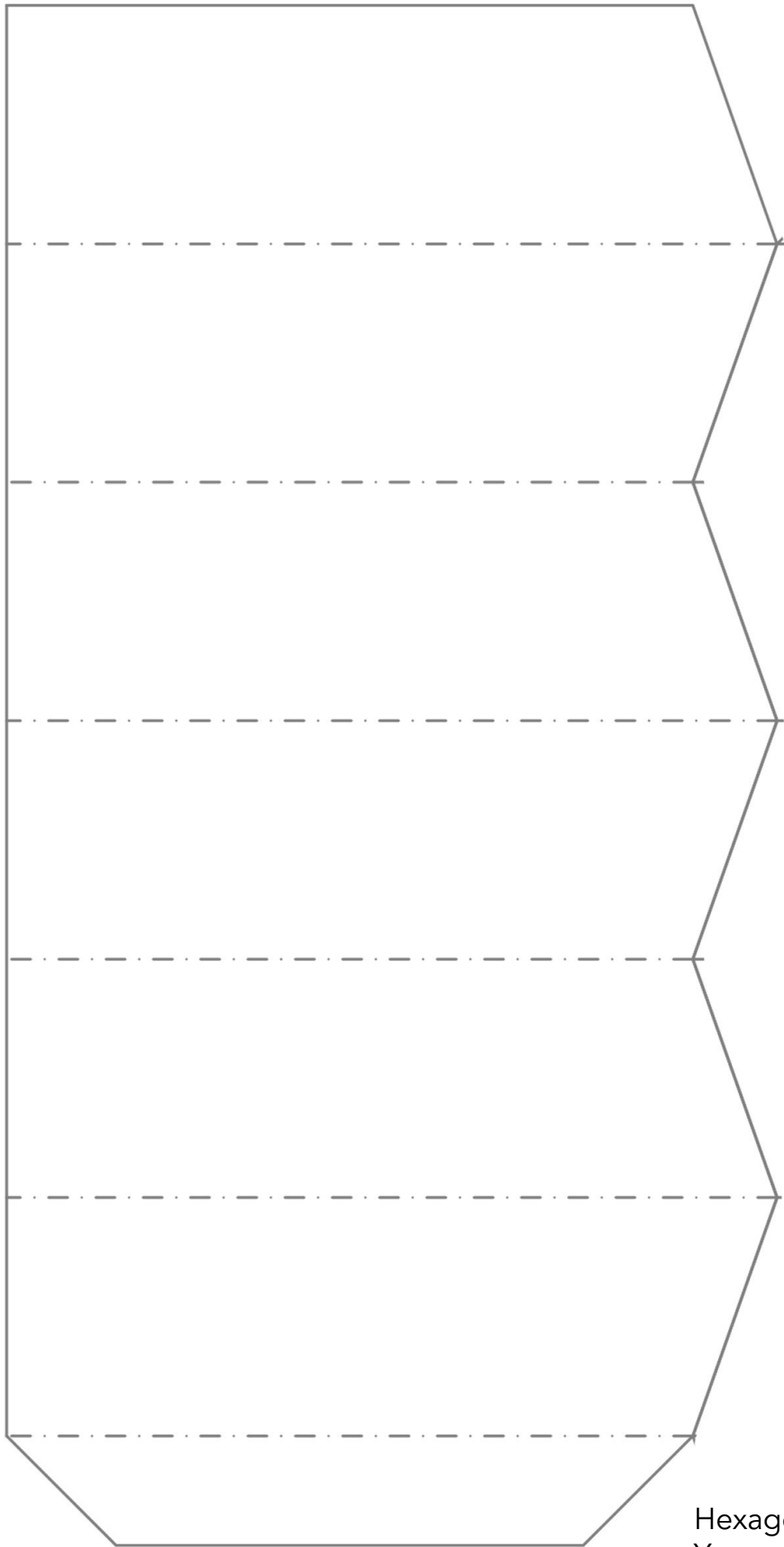
**So many
possibilities**



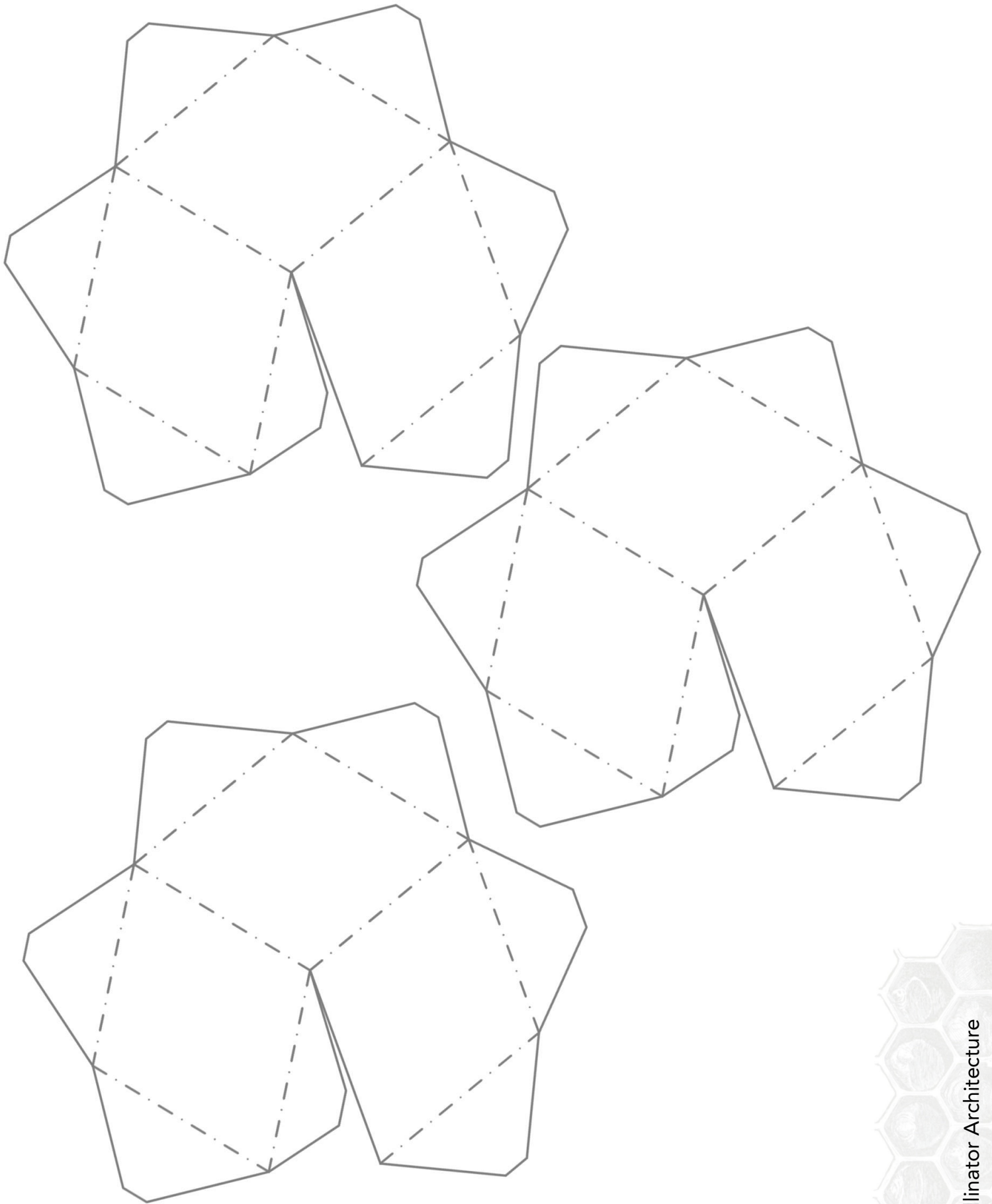




Pollinator Architecture



Hexagonal tube template
You need 7 to start



A half rhombic dodecahedron template
You need 7

