DIY Pentominoes

Pentominoes resemble the famous games of Dominoes and Tetris - the only difference is that pentomino is composed of 5 squares, whereas Dominoes have 2 squares and the Tetris block has 4 squares. A pentomino is a polyomino composed of five congruent squares, connected along their edges.

There are twelve shapes in the set of unique pentominoes, named T, U, V, W, X, Y, Z, F, I, L, P, and N respectively. As a mnemonic device, one only has to remember the end of the alphabet (TUVWXYZ) and the word FILiPiNo. In order to make a set of unique pentominoes, there are only two rules which must be followed.

- First, if one shape can be rotated to look like another, the two shapes are not considered to be different.

- Second, if one shape can be flipped to look like another, the two shapes are not considered to be different.

Pentominoes can also be used to examine the concepts of congruence, similarity, transformations (flips, turns, and slides), tessellations (tilting), perimeter, area, and volume in a relaxed atmosphere.
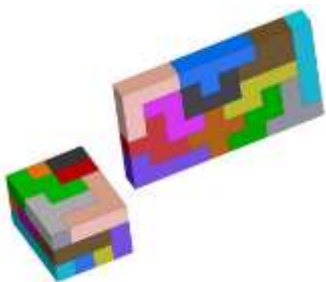
SUPPLIES NEEDED:

- 60 wood cubes
- Glue

Each one is given a single letter name that resembles its shape. In the image you can see how you can make all 12 pentominoes. Just arrange the shapes and glue them together.
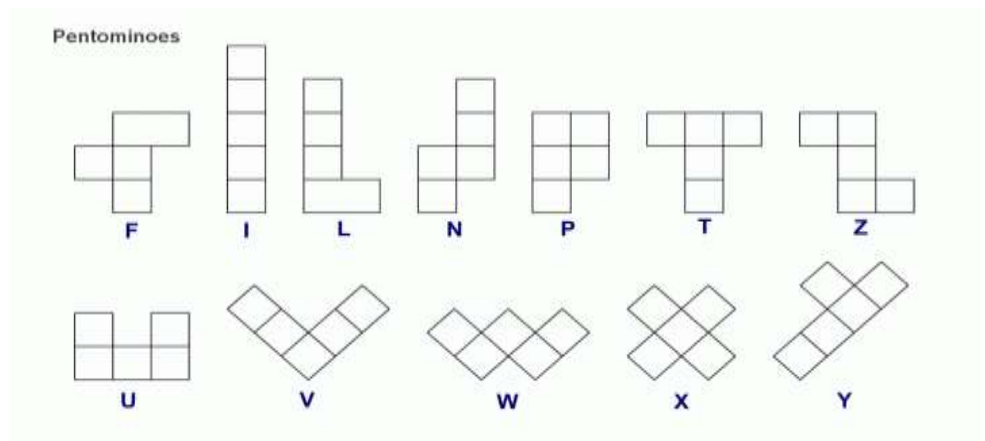
The pentominoes puzzle seems to be simple, but the number of various tasks and variations of solving those tasks makes this puzzle very interesting. There is even a variation of game where you do not have to use all 12 pentominoes. Download a plan for making a Pentomino board game.

With such basic shapes, your imagination is your only limitation!

Tasks

The task is to assemble these 12 pentomino pieces into the 12 various shapes using glue to stick them together. You can decorate your pentominoes however you would like.

Since there are twelve distinct pentomino shapes with each covering five squares, their total area is sixty squares. The pentomino puzzle is usually tiled in the rectangle, and the various dimensions of the rectangle are:

- 6 squares x 10 squares (2339 solutions)
- 5 squares x 12 squares (1010 solutions)
- 4 squares x 15 squares (368 solutions)
- 3 squares x 20 squares (only 2 solutions)

There are thousands of ways to arrange them into these rectangles, and your task will be doing it in as many ways as you can. The solutions do not include rectangles obtained by rotation and reflection of whole rectangle, but it includes those obtained by rotation and reflection of a subset of pentominoes. It is very interesting to tile rectangle with dimensions 8 squares x 8 squares, which is possible only if there are holes of 4 squares anywhere on a rectangle.
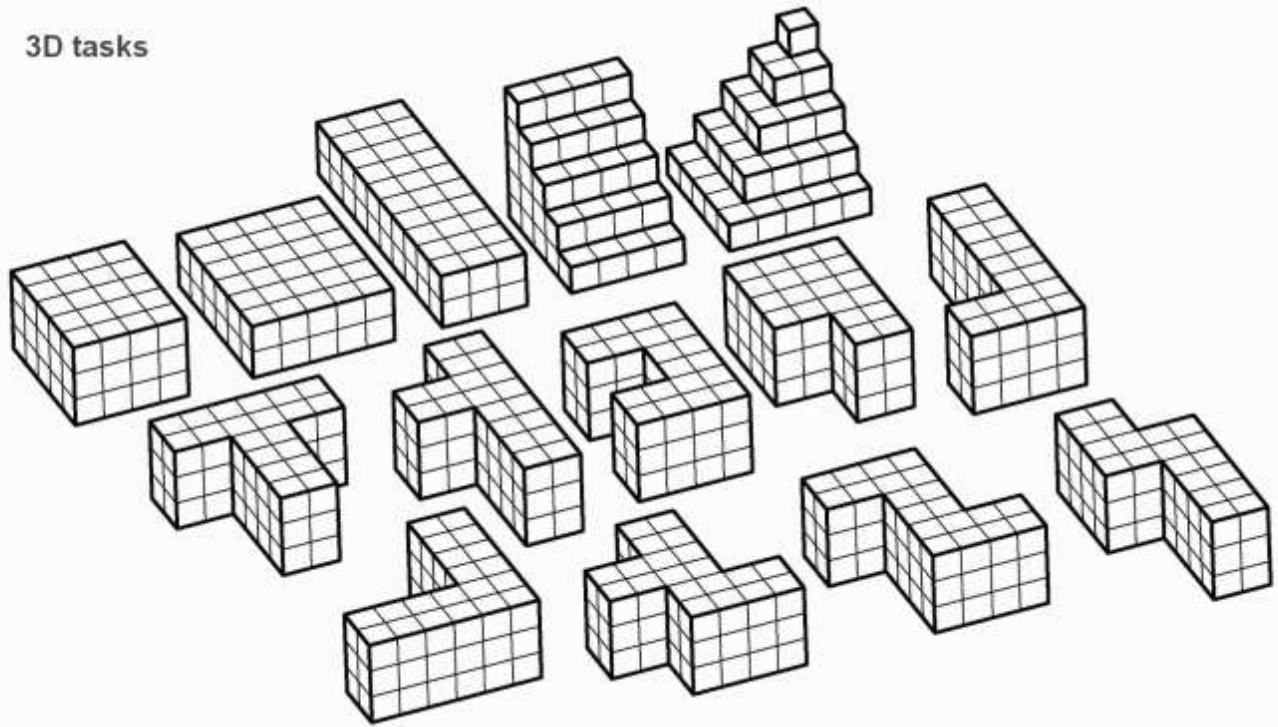

Several possible tasks

- A few 2D shapes, which you can make of all 12 pentominoes.
- A few 3D forms, which you can make using all 12 pentominoes.
- A solution to tile block 5 squares x 4 squares x 3 squares by using all 12 pentominoes.

A few 2D shapes, which you can make of all 12 pentominoes.
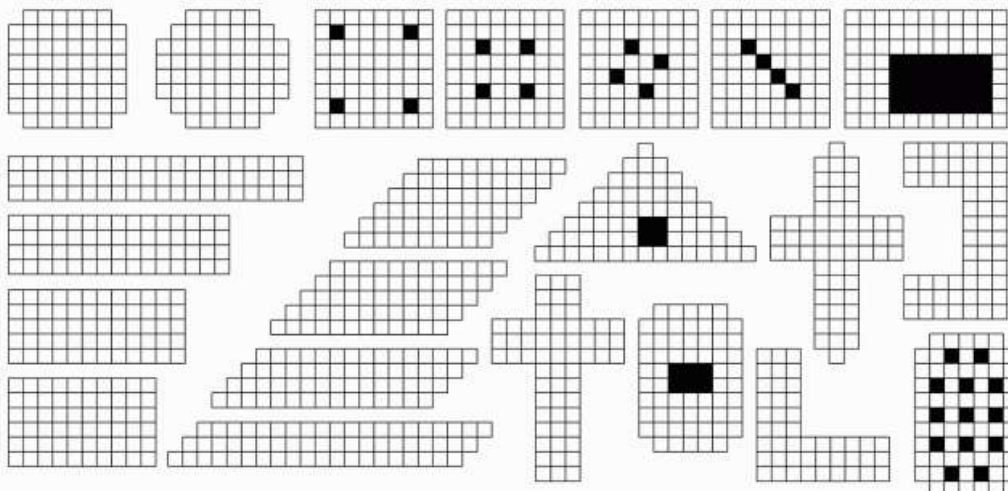
3D tasks

A solution to tile block