1

3 Brothers

Puzzle Goal:

Open each of the drawers

Materials:

walnut, tamo, etc.

Classification: Take apart

2

Arched Bridge

Puzzle Goal:

Slide the bridge frame to one of 6 different positions, then use the "brick" pieces to build the road across the bridge.

Materials:

Wenge, mahogany, and hard maple

Classification: Put-together puzzle

Notes:

The designer looked for a way to put some restrictions in polyomino pieces without playing with differed colors. He had the idea to form an arch so you can orient the pieces only 2 ways.

3

Block Box

Puzzle Goal:

Open the box.

Materials:

Sapele and Maple

Classification: Take-apart, sliding block Puzzle

Notes:

There are four different ways to preset the sliding blocks. Each setting is of increasing difficulty, and has one unique solution. The hardest setting takes 81 moves (not including the final lid opening up). The next settings are 53, 38, and 15 moves.

4

Bottle Puzzle

Puzzle Goal:

The neck and the shoulders of the wooden bottle revolve separately and freely, both clockwise and anticlockwise. The puzzle is to release an airline-type miniature glass liquor bottle inside.

Materials:

African blackwood with a boxwood cork

Classification: Take-apart Puzzle

Notes:

Once solved, the puzzler should celebrate with a drink, and then replace the empty bottle with a new miniature bottle of their choice!

5

Bundle of Wood

Puzzle Goal:

Remove all 9 wooden pieces and the gold locking pin from the carrying frame. Mix them up and then put them all back into the frame so none will fall out.

Materials:

Pieces: Bocote; frame: Maple

Classification: Packing and sequential movement

6

Can

Puzzle Goal:

Open the can.

Materials:

cherry tree, walnut, etc.

Classification: Take apart

7 Castle Money-Box Mk. 2

Puzzle Goal:

Use the free coin to release the coin inside.

Materials:

African blackwood

Classification: Take-apart Puzzle

Notes:

Care should be take when screwing and unscrewing any wooden threads.

8

Chequered Board Burr

Puzzle Goal:

Assemble the six pieces into a three dimensional cross. Find both solutions. Rotation of the pieces is neither necessary nor allowed.

Materials:

Wood, Walnut (dark wood), Hard Maple (light wood), decorative splines from Jatoba (aka Brazilian Cherry)

Classification: 3.4 Burrs

History:

This puzzle is one of the products of an extensive research, calculating all six board burrs. This is one of four of the most interesting designs. A booklet reporting on the research is planned.

9

Chromation

Puzzle Goal:

The 10 Chromation pieces create 10 distinct 9 piece puzzle sets. The primary goal of each of these puzzles is to construct a 3 by 3 by 3 cube, with each face a solid color having 2 adjacent faces of each of the 3 colors.

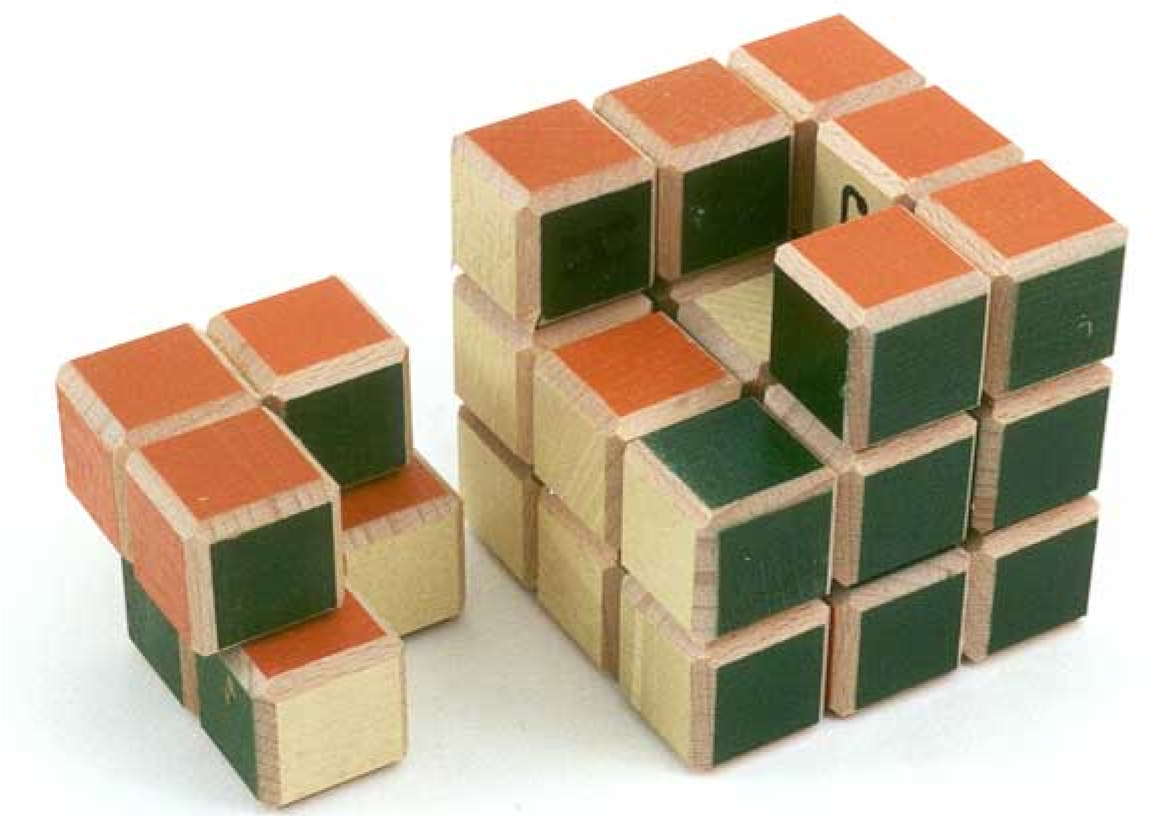
Materials:

Maple

Classification: Put-together

Notes:

8 of these have exactly 1 solution, 1 has 2 solutions and 1 contains 1 solution each to the 2 mirror primary problems. If you remove the matching adjacent faces constraint, there are over 40 secondary problems to the 10 puzzles, each with 6 solid color faces on the cube. (As a side note, each of the pieces is colored such that it has 2 adjacent faces of each of the 3 colors.) Each of the primary and secondary problems is a quite difficult puzzle in its own right.



10

Cityscape

Puzzle Goal:

Arrange the buildings to get the right skyline. The skyline is correct when you can see horizontally from each of the 4 sides as much buildings as indicated on the city map.

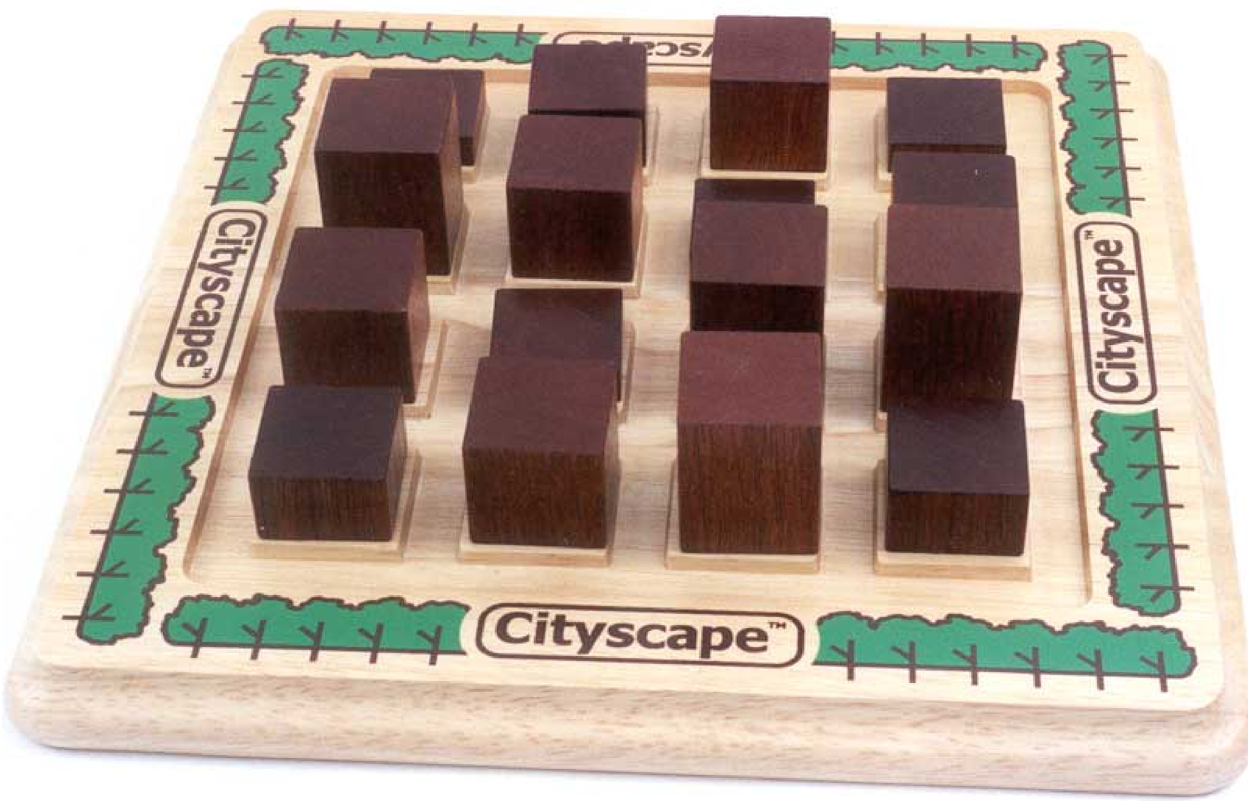
Materials:

Rubber wood

Classification: put together

Notes:

See booklet for a selection of separate challenges.



11

Collective

Puzzle Goal:

The puzzle is to take the Collective apart and reassemble it.

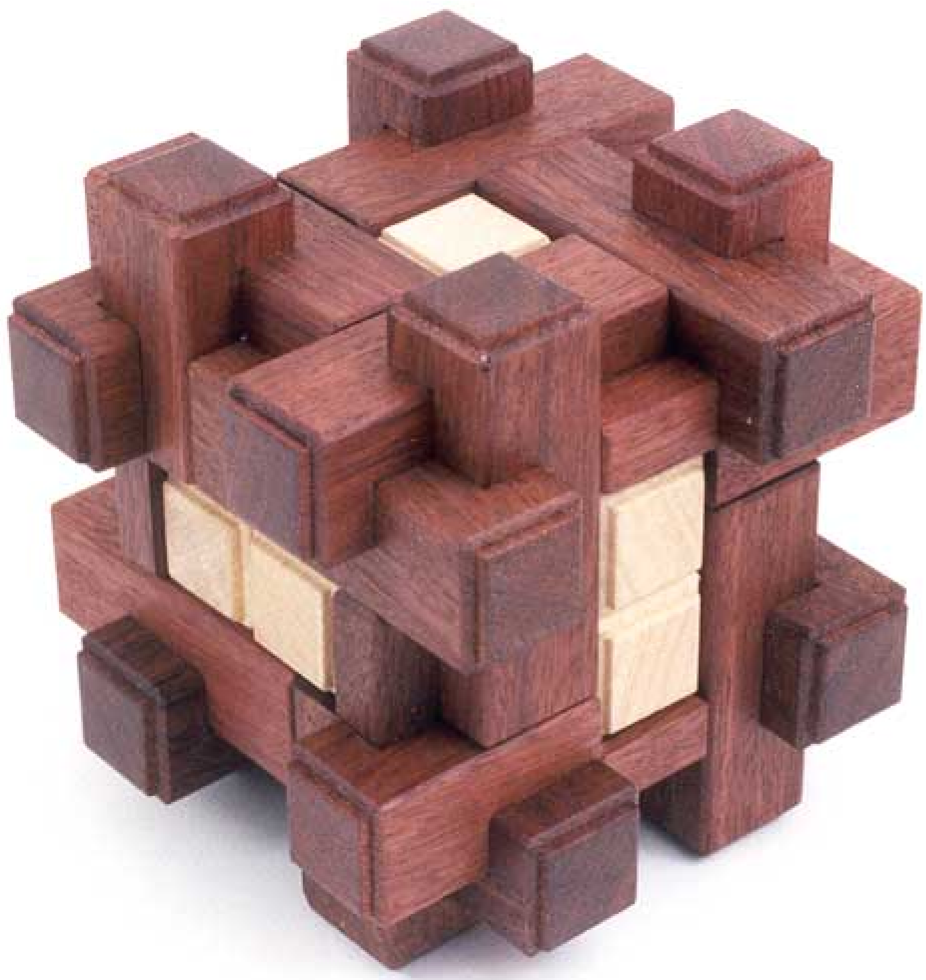
Materials:

Center burr: Queensland Silver Ash; Outer burr: Western Australian Jarrah

Classification: Interlocking

Notes:

Unlike normal framed burrs the five piece burr encased in the twenty-four piece frame work as one in this puzzle.



History:

12

Corner Cube

Puzzle Goal:

Disassemble and then reassemble the cube.

Materials:

center: Bolivian rosewood; middle: marbled macassar ebony; corner: cocobolo, Mexican kingwood, and bocote.

Classification: Interlocking

History:

The standard Second Stellation design begins with a cluster of six sided center blocks, upon which are glued triangular prism blocks to both ends. It doesn't matter whether the prisms are right or left handed as long as they are all the same. At this point, it is a Four Corners puzzle (Stewart Coffin design number 6) adding rhombic pyramid blocks next to the prism blocks turns the puzzle into Nova (Stewart Coffin design number 8) which is a symmetrical version of the 14-a Second Stellation puzzle that I originally tried this with. The trick to my modified Second Stellation is a base of three left handed zig-zags, and three right handed ones. From there I build all six pieces up the same, but three of them are mirror image of the other three.

Once again, the shape of this puzzle is simply a Second Stellation of the rhombic dodecahedron with the hexagonal dimples filled in -- these dimples can be filled in either with three rhombic pyramid blocks, or with two prism blocks, one right handed, and one left handed. I call the shape of this new puzzle Crowded Cluster because it appears to be a cluster of 8 rhombic dodecahedrons, however they intersect each other, which is why the cluster is 'crowded'.

Corner Cube is the truncated version of Crowded Cluster.

13

Cube Brick

Puzzle Goal:

Match the tops of the 15 cubes by color in 3x5 tray.

Build other shapes (in booklet) color-matched on top only.

Form 3-D shapes with non-matched colors on all joined edges.

Materials:

Laminated faces on cubes; deluxe wood box

Classification: 3D Edge-matching

Notes:

Each cube represents a selection of four colors from the set of six (15 combinations). Additionally, each is a corner-cube with identical colors on opposite corners. The result is that the six faces of each cube contain each of the six ways to orient four colors in a 2x2 pattern. So when solving a 2-D edge matching puzzle and when you want a certain combination of colors but only have it in the wrong orientation, with this set it will always be there!

14 Cube-like Puzzle Ring

Puzzle Goal:

Assemble a puzzle ring from the 13 pieces

Materials:

Sterling silver

Classification: Put together

15 Cubes

Puzzle Goal:

At the start, you should only see the color blue on the outside. Move the little cubies within the cage so that you only see orange.

Materials:

Wood, plastic, paint

Classification: Sequential Movement

Notes:

Inspiration for the puzzle: Inversion, Magic Jack and Rubik's Siamese Cubes.

16

Diamont

Puzzle Goal:

Assemble and disassemble the pieces.

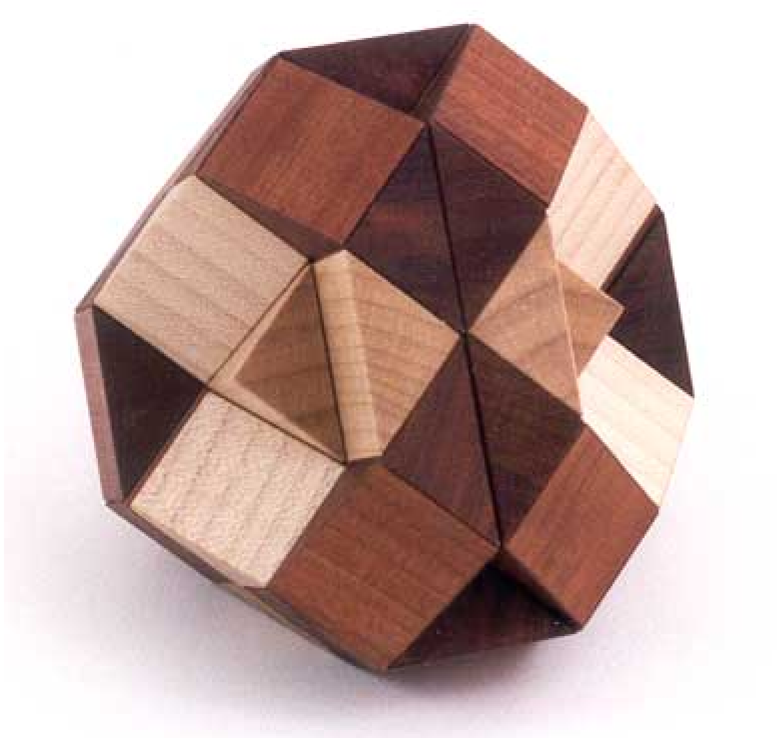
Materials:

plum-tree and maple

Classification: Put Together

Notes:

Interesting form of brain-teaser, created from basic elements - diagonal cube halves. The brain-teaser is created in simple space of cube 4x4x4. Only if we take away several elements on opposite corners of these cube 4x4x4 than arise interesting regular form. Space of a cube 4x4x4 has six regular sides, but at this brain-teaser there is perceptible four regular and symmetrical sides. Every one side contains regular hexagon.



17 DoveTail Bar Puzzle

Puzzle Goal:

Open the "box", by removing the top; in other words: "taking a bite of the bar!"

Materials:

Walnut and maple woods

Classification: Secret Opening, Take-Apart

Notes:

This was inspired by the familiar Popsicle stick ice cream bars, and specifically the Dove Bar Ice Cream, with the thought that a puzzle that resembles a known or familiar shape is more attractive and inviting of attention and interest. The walnut wood used is obviously indicative of the Dark Chocolate flavor.

18

Edge-Corner-Cube

Puzzle Goal:

Assemble the six puzzle-pieces to a 3x3x3 cube.

Materials:

Beech; stainless steel wires (1.5mm and 2.0mm)

Classification: interlocking

Notes:

While writing a computer program which should be able to solve packing puzzles of different kind, most of the time you have to deal with exceptions. It is not the regular case you have to care, but all these tricky cases you have to pay attention to. By writing I thought about the fact that most of the puzzles made of cubes consist of pieces of cubes which have been glued together by touching one side of a cube with another side of an other cube. Having realized this obvious fact it is clear how to go on: I extended my program to be able to connect cubes in the following three ways: side by side (6 directions), edge by edge (12 directions), corner by corner (8 directions). And by using all these three kinds of linkages I came up with a design of a 3x3x3 interlocking cube which consists of six pieces.

The puzzle has been designed only by using paper and pencil and with a vague idea of the pieces to interlock. After having finished with this it has been clarified by using this program that there is only one solution.

Having done the theoretical work there has to be constructed a physical model. While using the linkages "edge by edge" and "corner by corner" all edges of every little cube has to be beveled. Apart from removing the 1x1x1 little cube at the beginning it takes 6 moves to remove the first piece.

19

Four Triangles

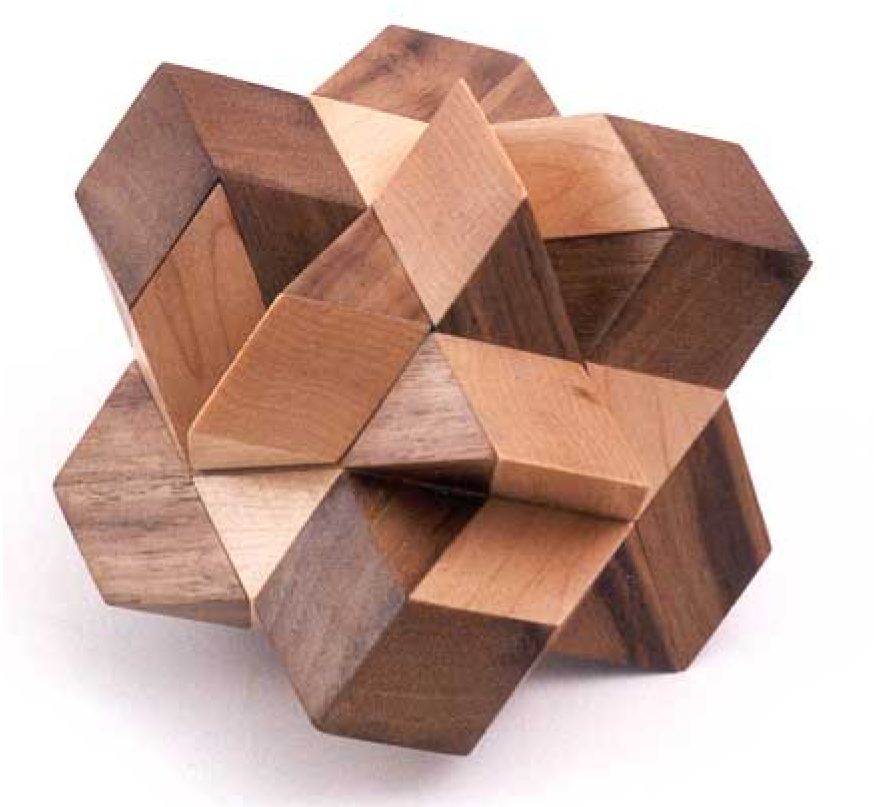
Puzzle Goal:

Six dissimilar pieces join together to form four triangles.

Materials:

Hard maple and black walnut

Classification: Interlocking



20

Gold-Silver-Bronze

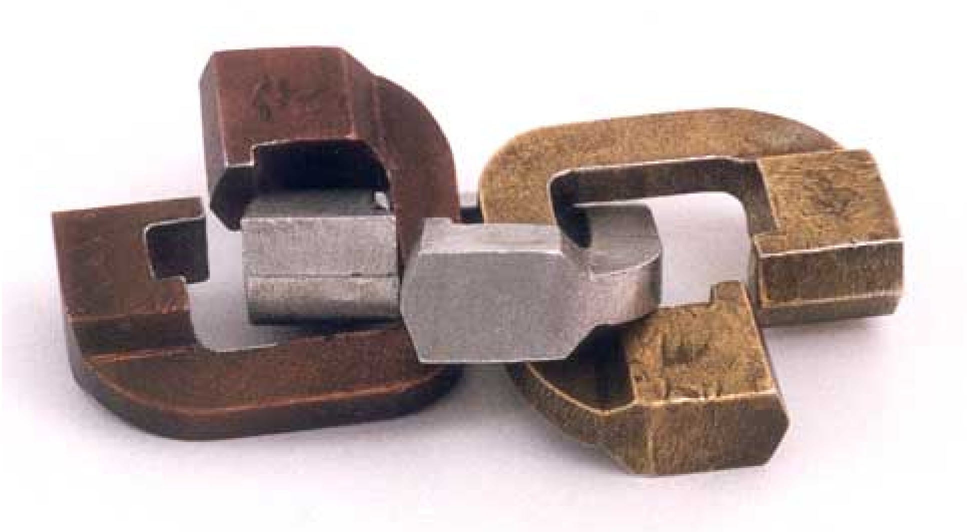
Puzzle Goal:

Take the three rings apart. Then put them back together again in the order Gold-Silver-Bronze

Materials:

Cast tin, galvanized with gold and copper

Classification: Take-apart



Notes:

More than 5 years ago, I had the crazy idea of a special three-piece chain. It should be possible to interchange the order of the links, but the chain could not be taken apart. I found a working design after several hundred hours of searching and making over twenty prototypes of cardboard, plastic, led and tin. By making notches in two pieces, the chain could be taken apart. However, you should first bring the links in the right order.

I also designed a more difficult version of this puzzle. Topologically, there are no less than 24 ways of having three links in a row, and 16 ways of having the three links through each other. By modifying the exact shapes of the links, I turned the puzzle effectively into a mechanical maze. You have to find your way through the 24+16=40 states of the puzzle in order to take it apart.

21 Holey Box Packing Puzzle

Puzzle Goal:

Pack all 12 identical pieces into the box through the square hole in the top.

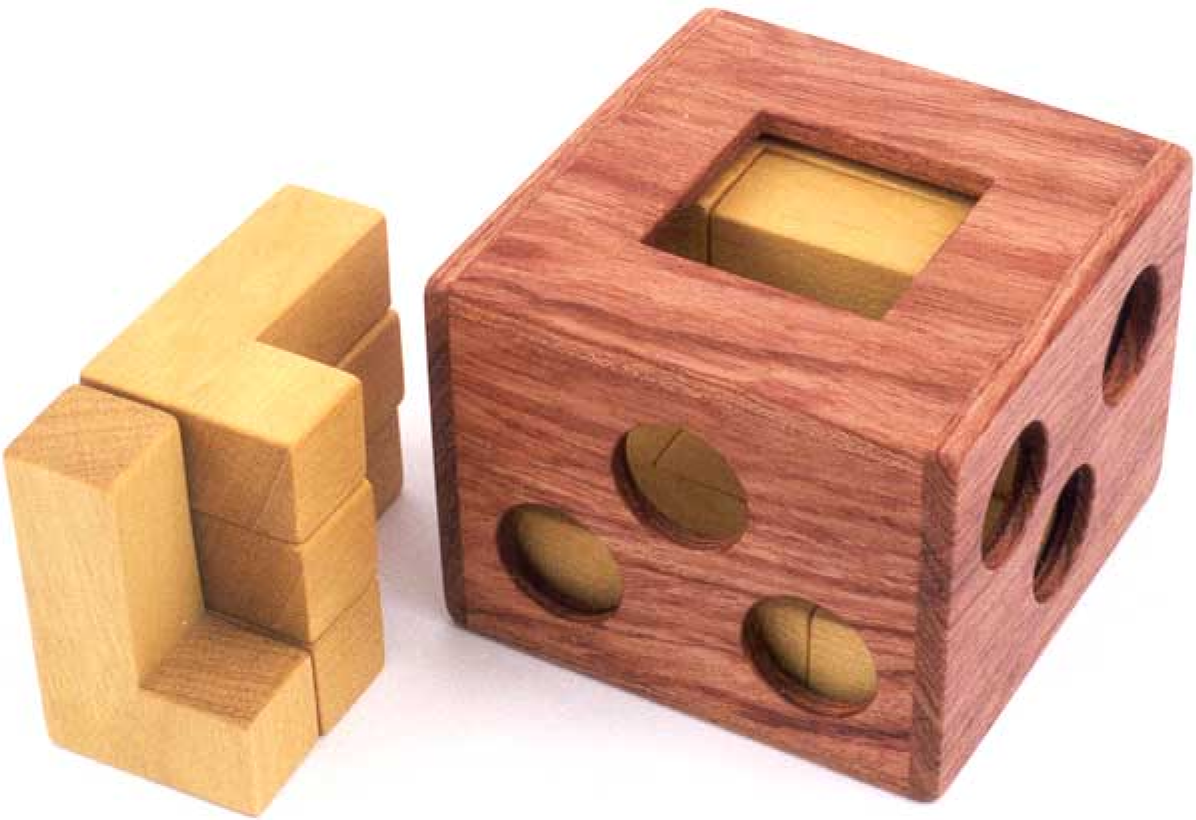
Materials:

Box: African Bubinga; Pieces: Brazilian Satinwood

Classification: Put together, box packing

Notes:

The 12 identical pieces can only enter the box through the (square) hole. The other holes in the box are not only for making it possible to have more looks into the inside but are also needed to manipulate the pieces to make the necessary moves, twists and rotations.



22

IPP Slide

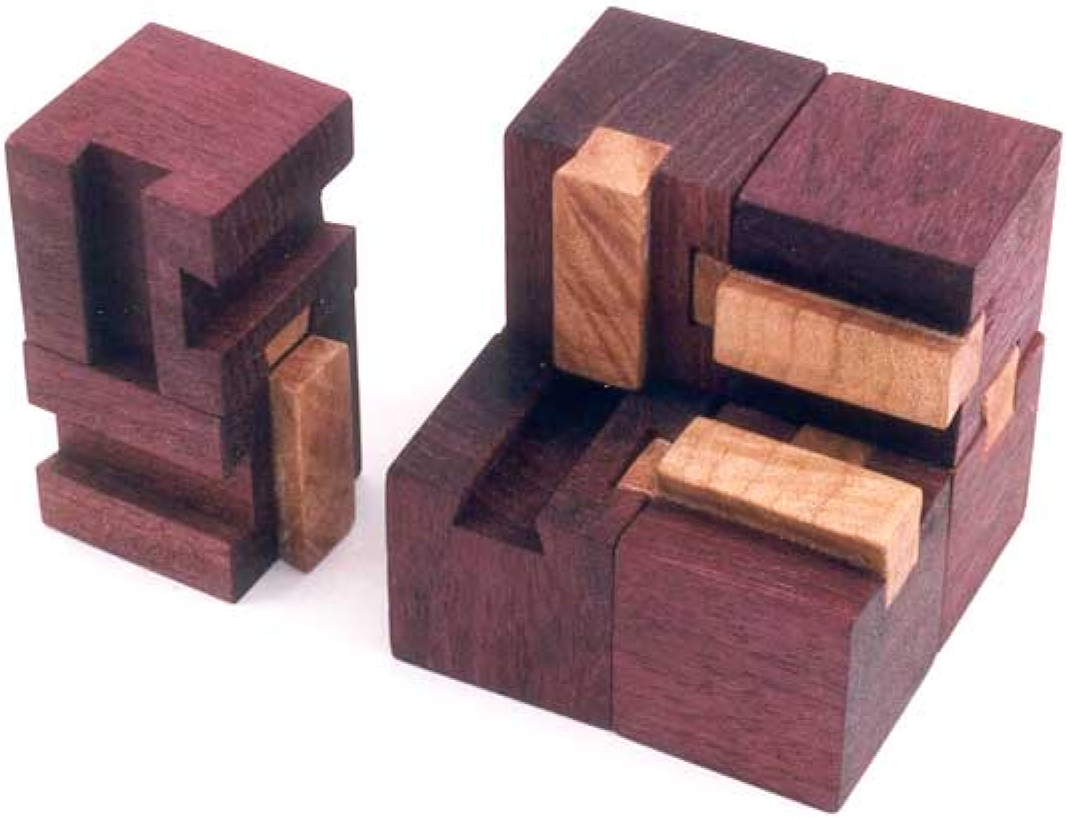
Puzzle Goal:

Assemble the 8 pieces into a 2x2x2 cube.

Materials:

Purpleheart/Redheart w/Myrtlewood dovetails

Classification: Put Together



23

IPP22 Puzzle

Puzzle Goal:

Arrange the 16 pieces (tetriamonds, pentiamonds, and selected hexiamonds) forming the IPP to make the 22. Now solve the IPP again. Other shapes can also be created.

Materials:

Lasercut acrylic in red, white, blue

Classification: Put-together puzzle

Jar Breaker

Puzzle Goal:

Help the chain gang "prisoner" break out of the bottle "jail"

Materials:

Mixed Media

Classification: Take-apart and dexterity

25

Jewelry Box

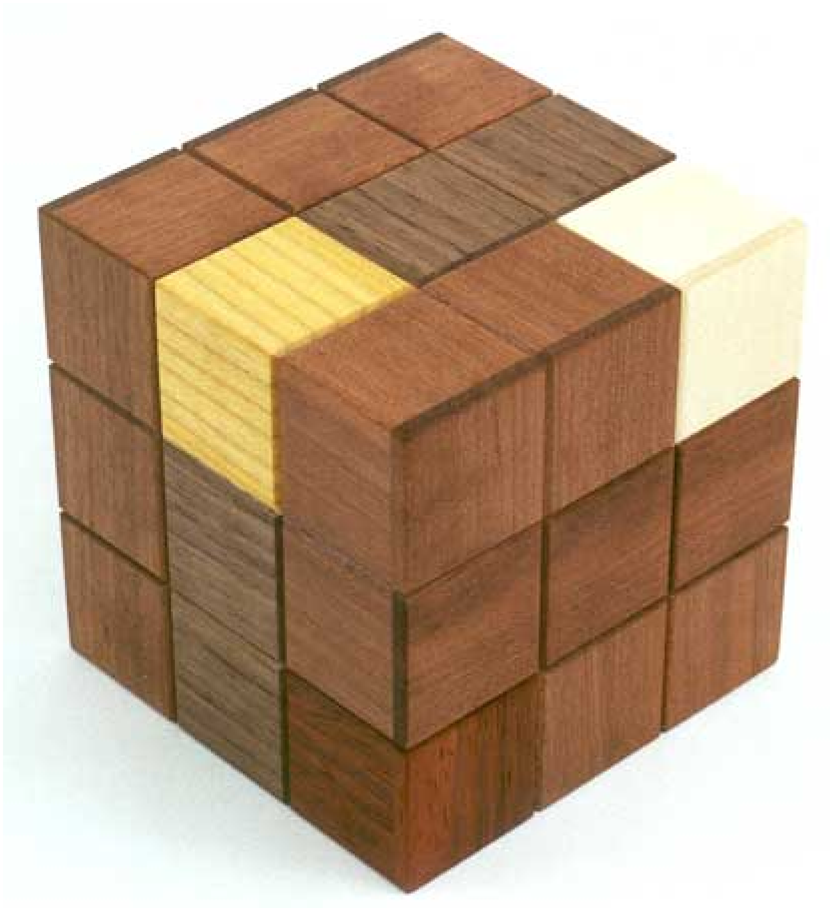
Puzzle Goal:

Find the hidden jewelry drawer

Materials:

walnut, mizuki, makore, padock, urushi

Classification: Take apart



26 Key Ring

Puzzle Goal:

Take the two identical pieces apart. Then put them back together again, matching the two Scott Kim inversion words "Key" and "Ring".

Materials:

Metal

Classification: Routefinding, Sequential Movement

History:

I have used parity changes in many designs. The simplest example is the two topologically different ways to link two rings together. I used this concept to make a simple take-apart puzzle with two identical rings.

Then I needed something to indicate the start position. Two matching arrows or other symbols could do the trick, but that would look boring. Two matching words would be better. I chose the words “Key Ring”. However, the two pieces would become different, as the two words are different. Then I thought of Scott Kim. Scott made a beautiful Key Ring inversion for me and the two pieces became identical again.

27

Kinato

Puzzle Goal:

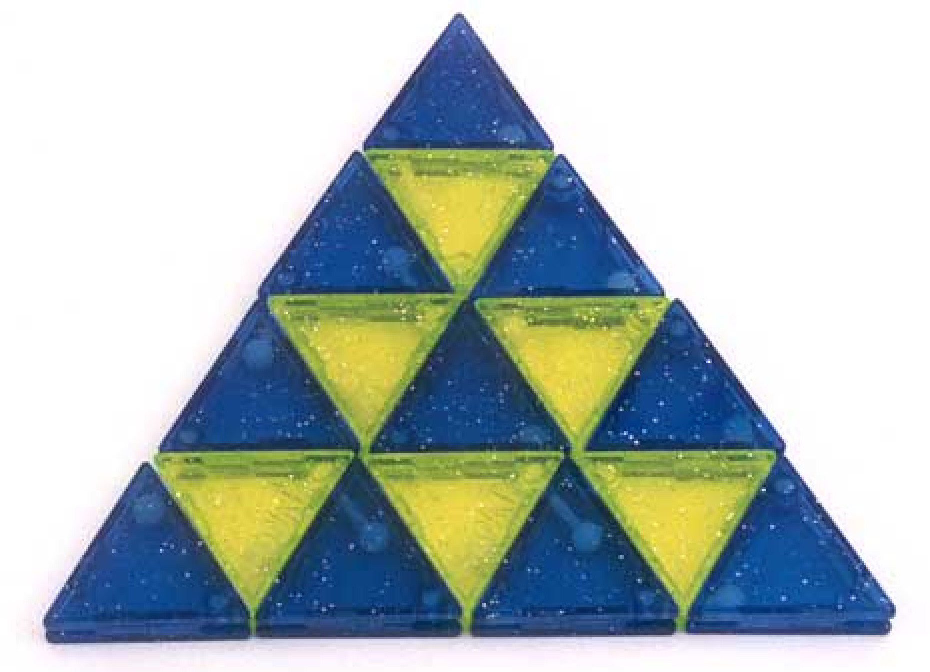
Primary goal: create an equilateral triangle with a "triangular checkerboard" pattern.

Additional patterns and Tangram-like shapes are given in the product booklet.

Materials:

PS Plastic

Classification: Silhouette puzzle



Notes:

KINATO is formed from small triangular plastic components linked together to form a chain. Each equilateral triangles is free to turn either from left to right or right to left by 60 , 120 , 180 , or 240 or it can be flipped upwards or downwards by 180 and 360 .

28 Kubusmix

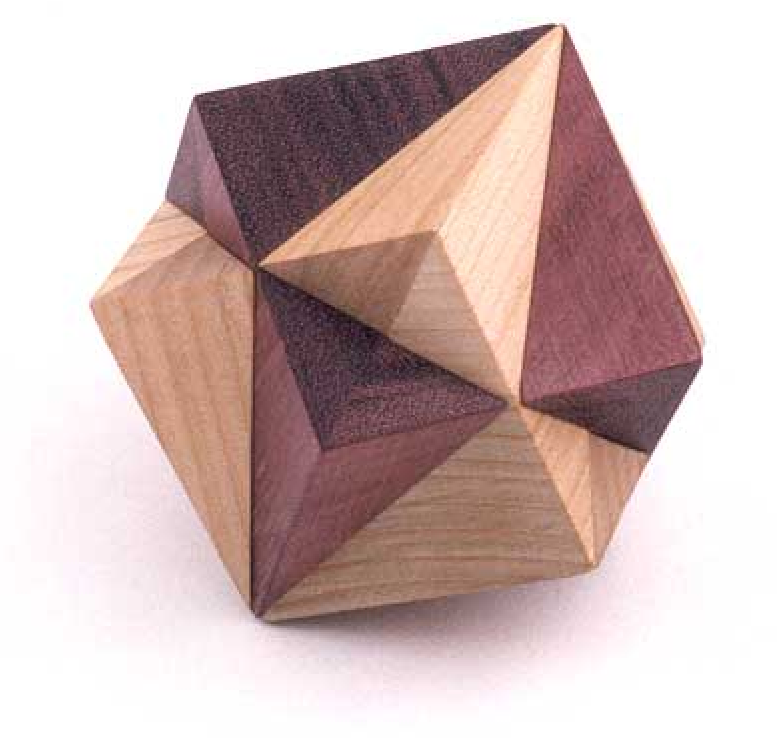
Puzzle Goal:

Assemble or disassemble the 6 interlocking pieces.

Materials:

Amarand and Pear

Classification: Interlocking



Notes:

The design was driven by the admiration of geometrical shapes, especially compounds of polyhedra. The mix of two cubes has not only a surprisingly new interlocking principle, but its 3D shape is also a pleasure to watch.

29 Leaves Coaster Puzzle

Puzzle Goal:

Arrange the leaves against each other to form a triangle.

Arrange a triangle in which leaves of the same color touch each other.

Arrange a triangle in which leaves of the same color do not touch each other.

Just play with the leaves to make any shape you like.

Materials:

color ply birch wood

Classification: put together

Notes:

This puzzle set consists of 12 different coasters. The basic form is a leaf with inside and or outside notches. All combinations (except for one asymmetrical) are in the set. Each leaf coaster is symmetrical in at least one way.

30 # Literal Lateral Slide Puzzle

Puzzle Goal:

Take the puzzle entirely apart into all of its pieces and put it back together again.

Materials:

Walnut, Jatoba, and Jarrah

Classification: 3D Take-apart puzzle

Lost In Space

Puzzle Goal:

Starting position: 16 puzzle pieces are fitted into the bigger square of the playing board filling the square, with the extra square piece sitting in the small square of the puzzle board.

Goal: rearrange the puzzle pieces so that all 17 pieces fit into the big square of the puzzle board.

Materials:

Birch plywood, cherry, ash, walnut

Classification: Put-Together

32

Lox In Box

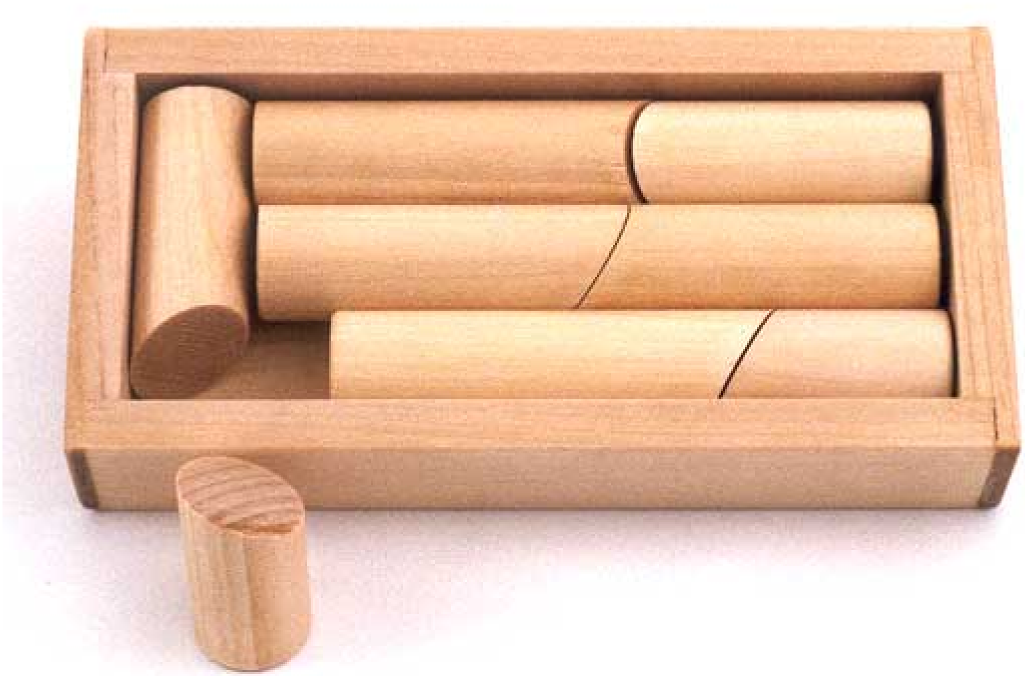
Puzzle Goal:

Put logs (lox) into the box.

Materials:

Birch

Classification: Put together



33

LT

Puzzle Goal:

1. Use all seven pieces to make the letter L

2. Use all seven pieces to make the letter T

3. The real challenge is to use all seven pieces to make the letters L and T at the same time.

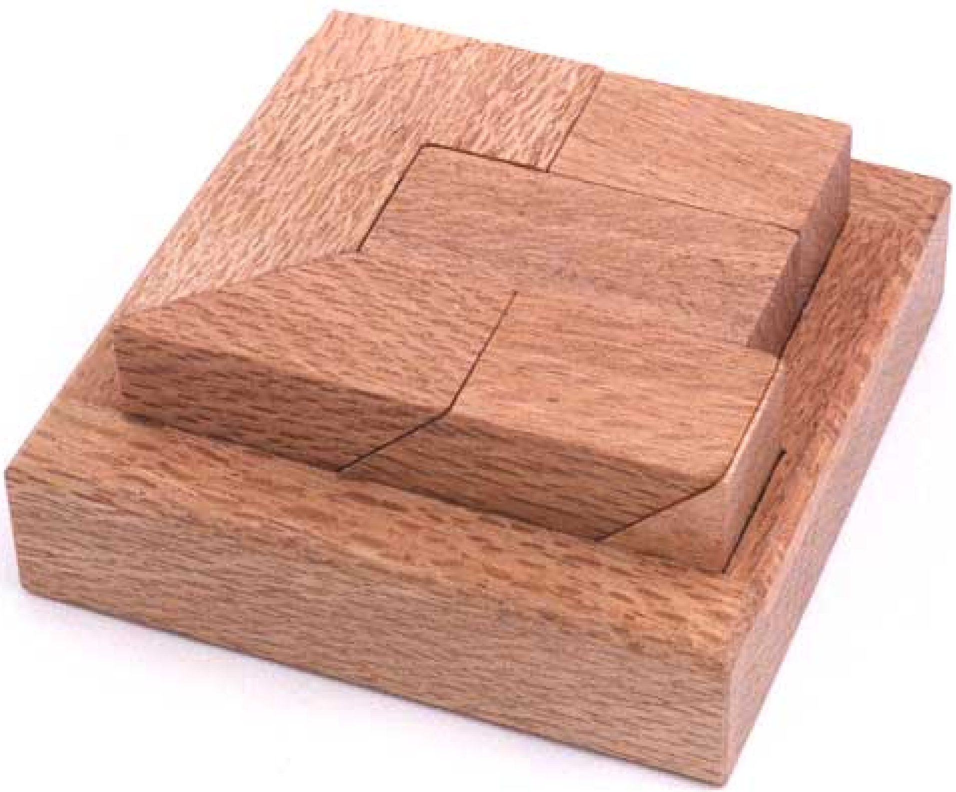
Note: the dimensions of the vertical and horizontal strokes in the letters L and T are in all cases exactly equal and symmetrical.

For some even getting the puzzle back into the tray may be a challenge.

Materials:

Queensland Silky Oak (Lacewood)

Classification: Put Together



34

Minimatch

Puzzle Goal:

Match the 9 pieces by color in 3x3 tray and other shapes.

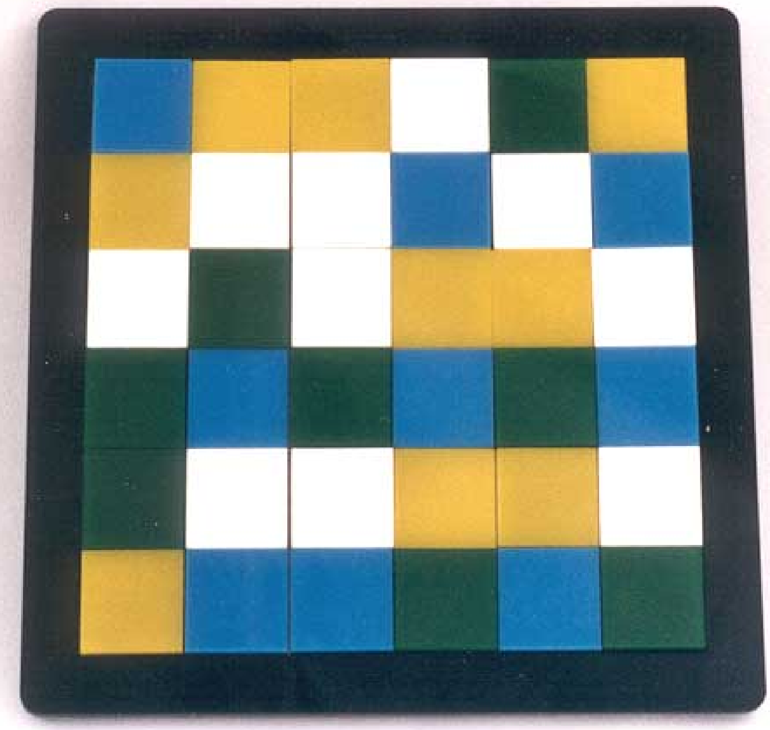
Form the 3x3 with non-matched colors, and with symmetry of one color.

In a non-match solution, maximize larger squares with uniform corners.

Materials:

Lasercut acrylic in yellow, white, blue, green.

Classification: 3x3 Edge-matching



History:

In the beginning was Percy MacMahon. His edge-colored Three-Colored Squares were published in his More Mathematical Pastimes in 1926. These inspired others to postulate vertex-colored squares. Using all permutations of three colors, these sets produce 24 distinct tiles each. (See Kadon's Multimatch I and Multimatch II.)

Using four colors expands the sets to 70 tiles. (See Adrian Fisher's Quartermaster and Kadon's Grand Snowflake for embodiments of the edge-marked four-color sets.)

A subset of the 70 corner-colored squares is the present challenge: Minimatch. Just 9 tiles form a 3x3 square with all joined edges matching on both corners. Six of the tiles contain all four colors in every possible order. The other three tiles have three colors, with the duplicate corners diagonally opposite ("bow-ties"). The number of solutions is unknown. It is proven that the center tile cannot be a bow-tie.

35

Nine-Piece, Nine-Color

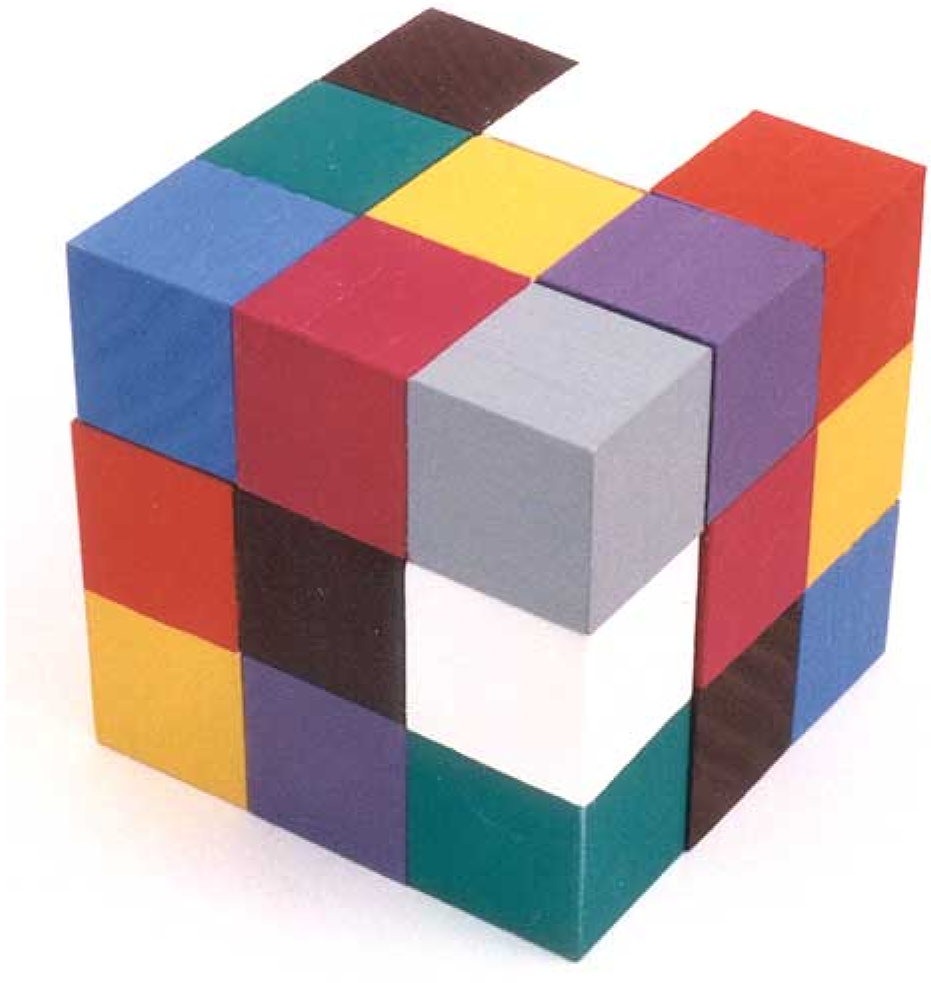
Puzzle Goal:

Assemble the nine colored tricubes into a 3x3x3 cube such that nine different colors are displayed on the six faces of the cube.

Materials:

White poplar; acrylic paint

Classification: Assembly



36

Optimal Pentominoes Checkerboard

Puzzle Goal:

Main problem: Put the 12 pentominoes and one tetromino to form a checkerboard. Find a solution for each of 7 tetrominoes. The pieces are one-sided.

Problem #2: Fill two trays in checkerboard fashion: the smaller one only with tetrominoes and the larger one with 12 pentominoes and one tetromino.

Materials:

Wood (ash-tree)

Classification: Put-together

History:

The problem of the well-known Dudeney's puzzle "The Broken Chessboard" first published in 1907 is to put the 12 pentominoes and the square tetromino together to form the checkerboard. The solution of this puzzle is not unique.

The main problem was posed in 1993 and solved in 2000 by a computer program written by A. Blumbergs, namely the one of finding the checkering(s) of 12 pentominoes having a unique solution for as many checkered tetrominoes as possible. Additional information can be found in CFF 53, Oct., 2000, pp28-30.

37

Partita

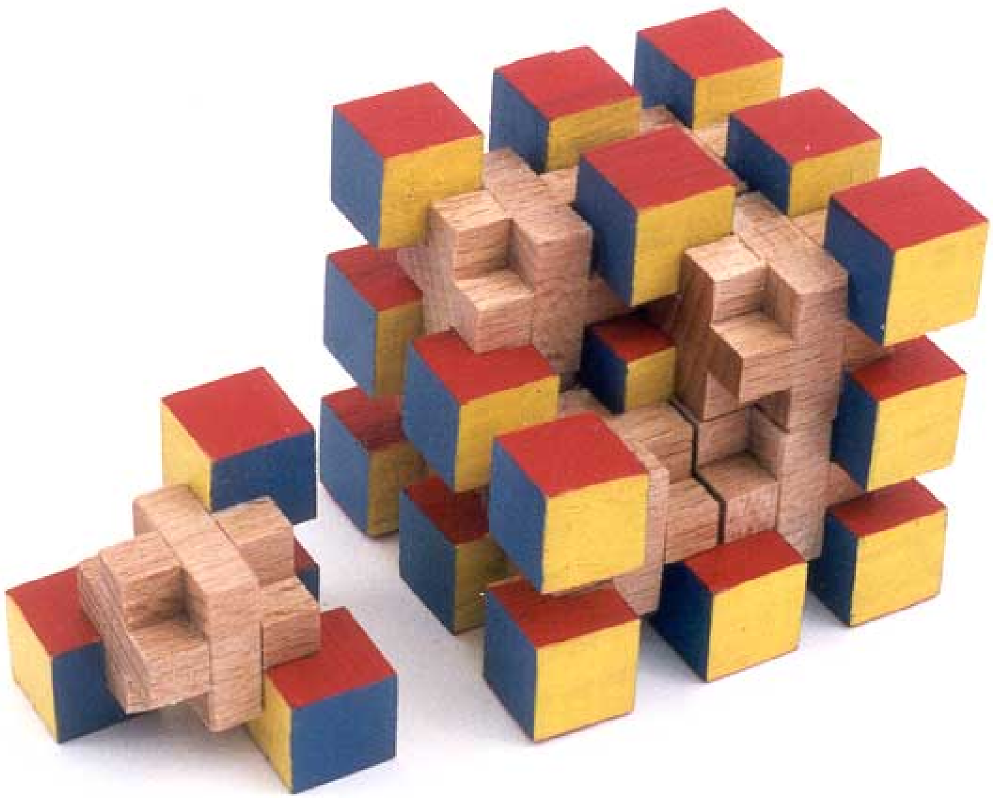
Puzzle Goal:

The object of the puzzle is to assemble the pieces into a size 3 cube with solid color faces.

Materials:

Painted wood

Classification: Put together



History:

The eight pieces have been chosen from the set of twenty-two polycubes (including disjoints) that fit insides a 2x2x2 cubic matrix. An earlier description of this piece set was published by Michael R. Straight, but no previous mechanical puzzle designs using them have been found.

Pear Puzzle

Puzzle Goal:

Puzzle 1 requires the separation of the Pear into halves.

Puzzle 2 requires the removal of the freely rotating cover to the bottom compartment of the Pear.

Puzzle 3 requires the opening of the upper half of the Pear.

Materials:

Pink ivory

Classification: Take-apart

39

Pineapple Secret

Puzzle Goal:

Open the secret compartment

Materials:

katsura, keyaki, wenge, etc.

Classification:

40

Pinnex

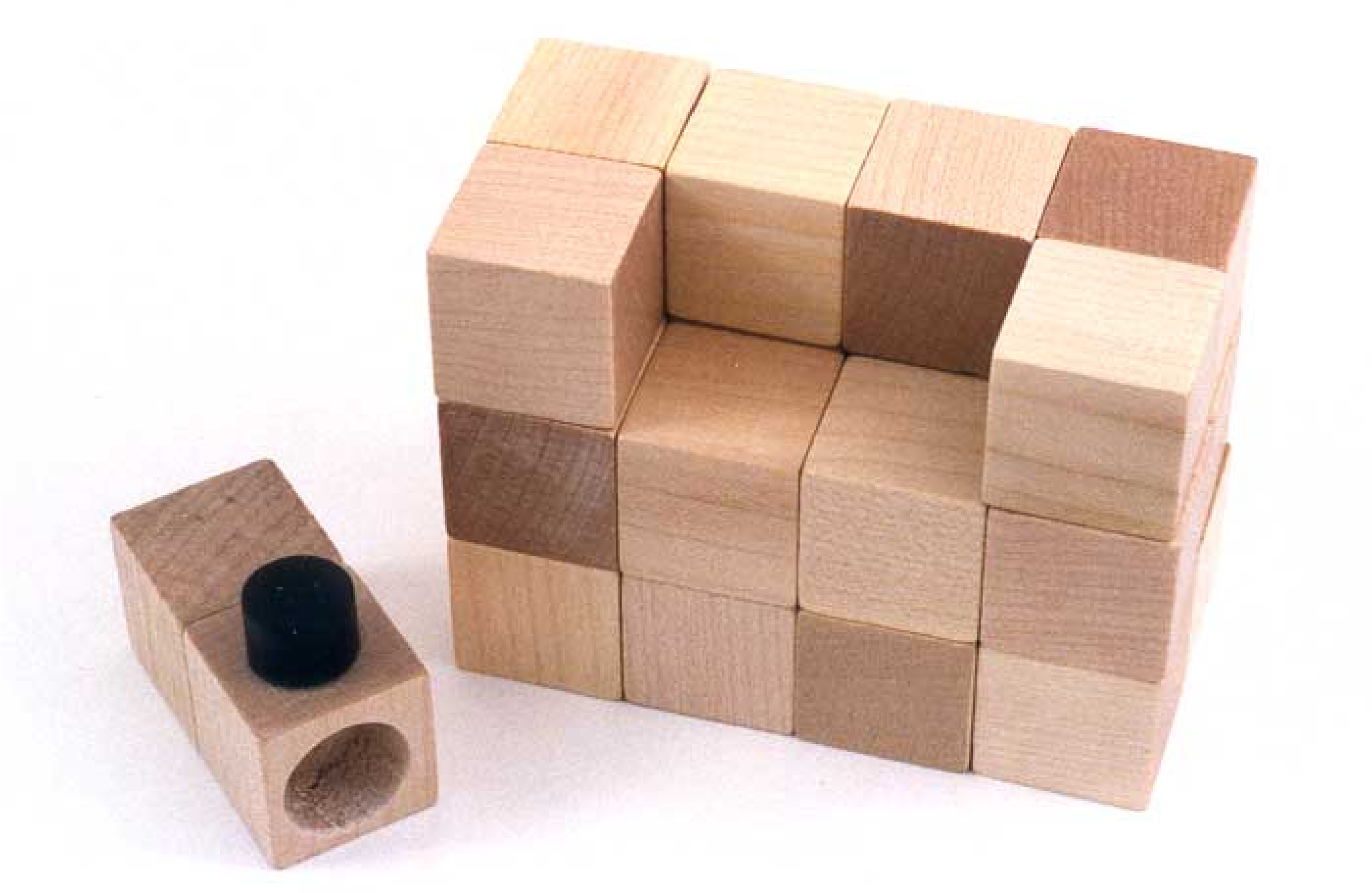
Puzzle Goal:

Build objects with the blocks by fitting each pin in a hole of a next block in such a way that you cannot see any pin or hole from the outside. Several objects are in the booklet.

Materials:

blocks: blanc ahorn wood; pins: black ahorn wood

Classification: put together



Notes:

This puzzle consists of a logically complete set of 12 different building blocks. Each block measures 1 x 1 x 2 units and has one pin and one hole.

41

Polo-Shirt Case

Puzzle Goal:

Place four Polo-Shirts flat in the both sides of frames.

Materials:

MDF board

Classification: 2D put-together

42

Polyhedron32 puzzle

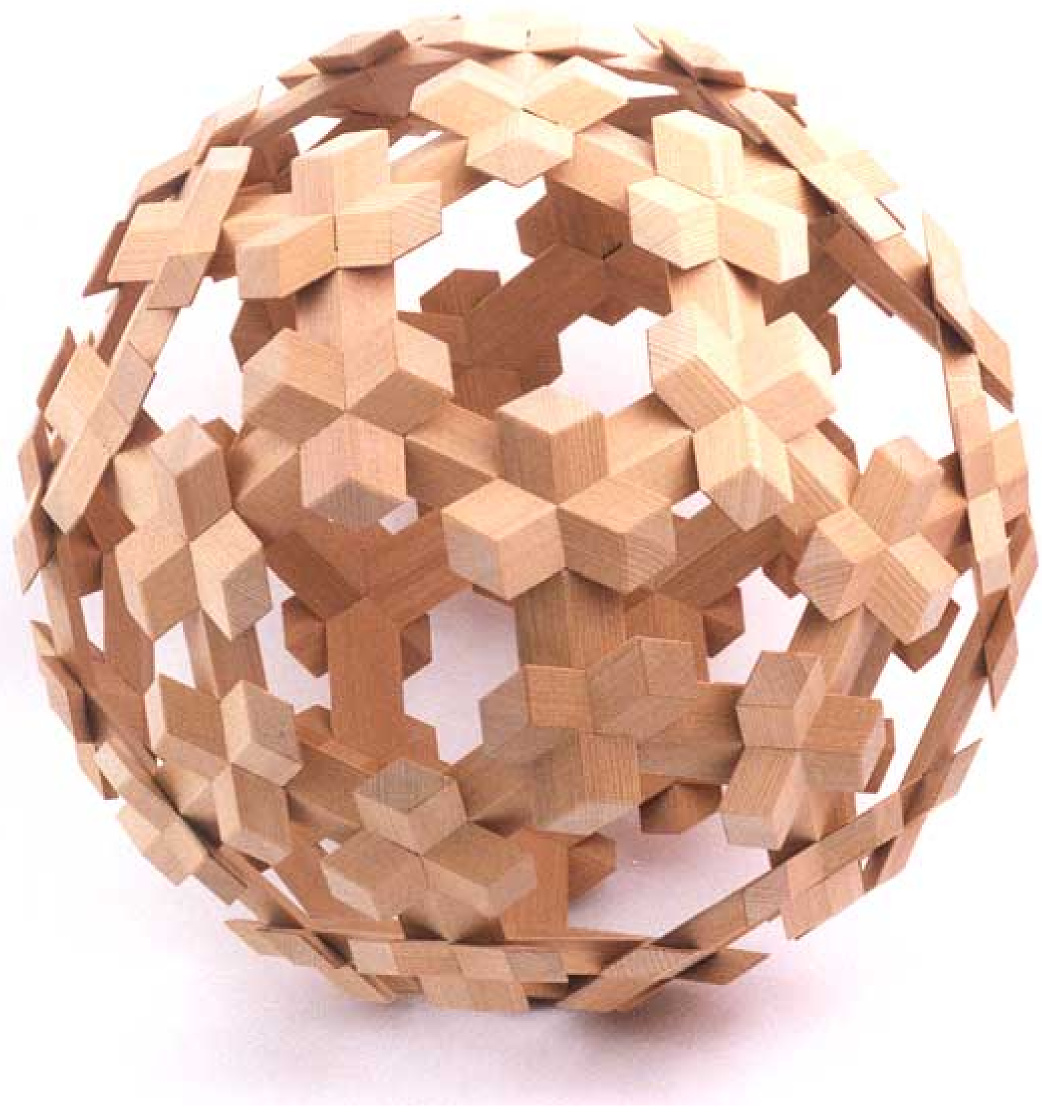
Puzzle Goal:

Disassemble and reassemble the figure.

Materials:

Taiwanese cypress

Classification: Interlocking



43

Princess Heart

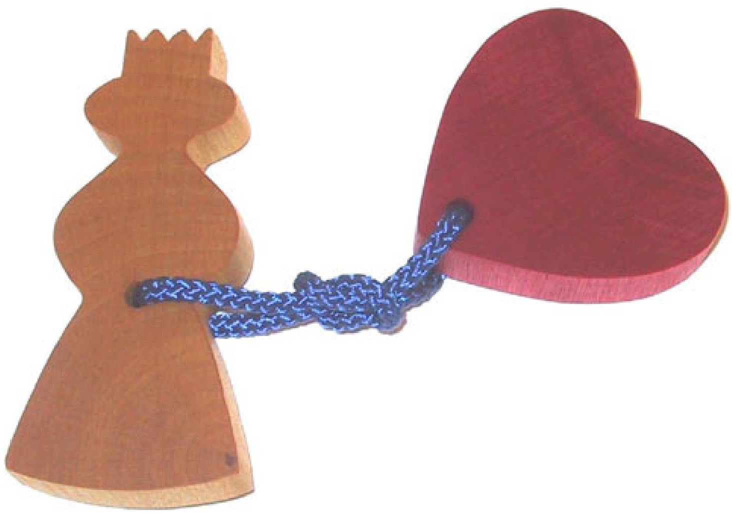
Puzzle Goal:

Untie the heart from the princess

Materials:

Birch wood and polyester rope

Classification: Disentanglement



44 Q-Burr

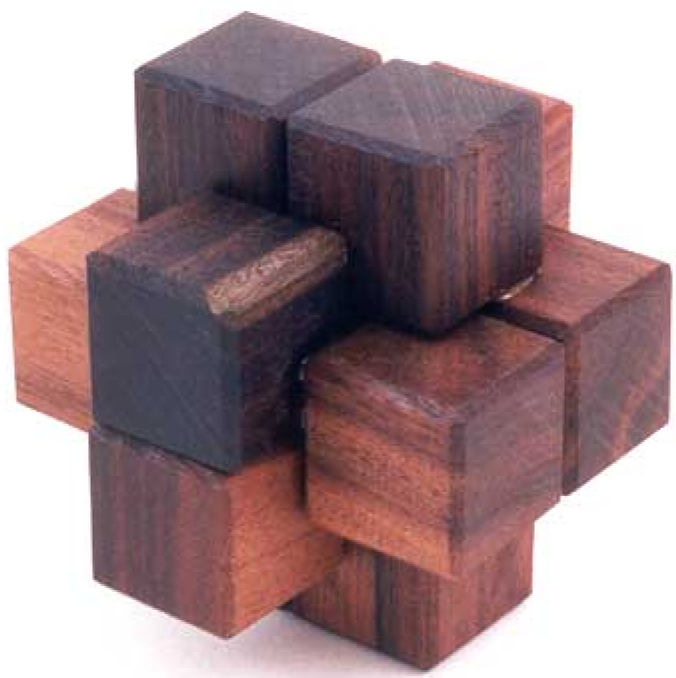
Puzzle Goal:

The goal is to assemble the three pieces into the shape of the classic 6-piece burr.

Materials:

Rosewood, finished with Velvit Oil; joints are doweled and glued.

Classification: Interlocking



45

Rope-ladder

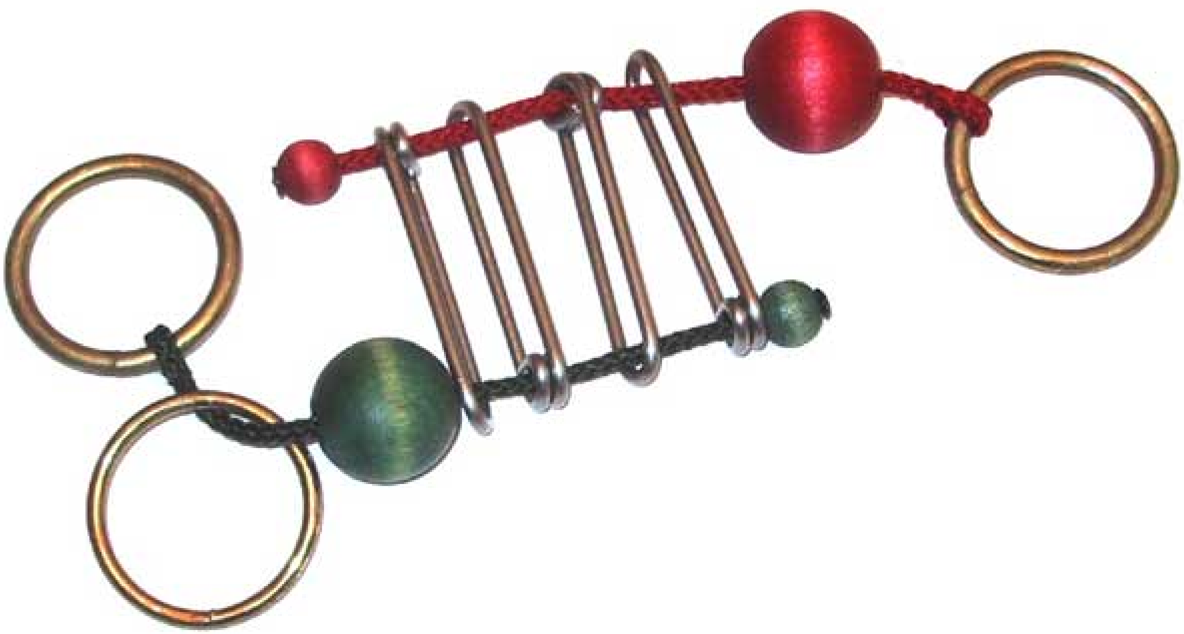
Puzzle Goal:

Remove the loose metal ring.

Materials:

Birch wood, metal ring, stainless thread and polyester rope

Classification: Disentanglement



46

Soma Summarum

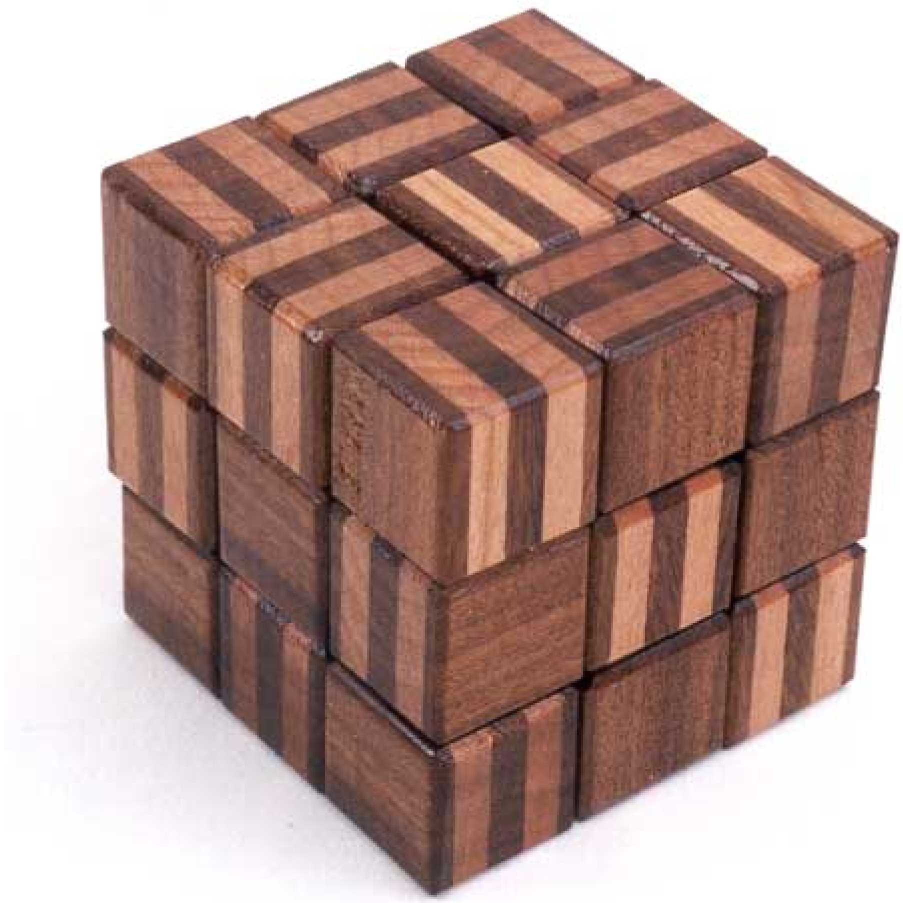
Puzzle Goal:

Arrange the seven Soma pieces to form a 3*3*3 cube
in such a way that each side of the cube shows an ordered checkered pattern.

Materials:

Cherry, Afromosia

Classification: Put-Together



47

Square Dance

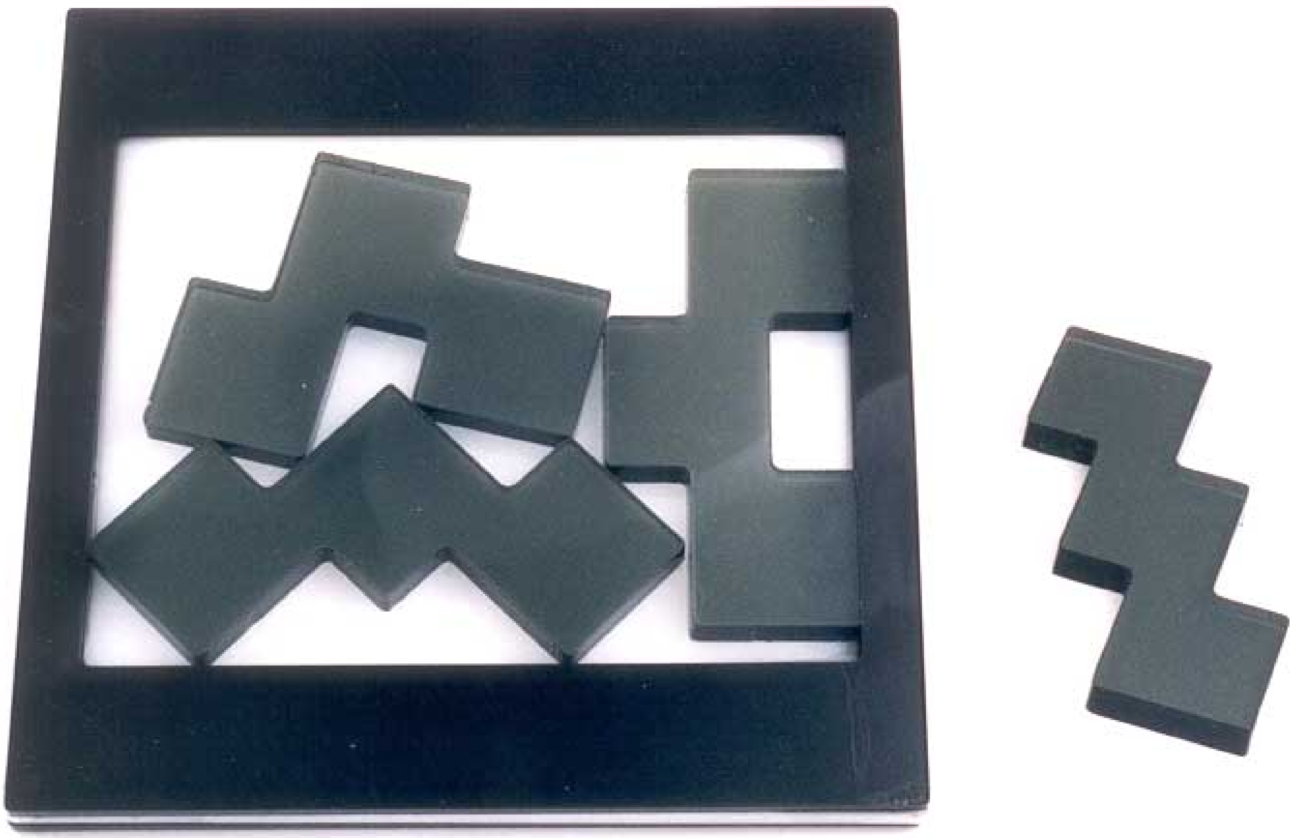
Puzzle Goal:

Fit all four pieces into either side of the tray.

Materials:

¼" smoked acrylic (pieces), 1/8" black acrylic (top and bottom of tray), 1/8" white acrylic (middle of tray)

Classification: ASS-CART (2D)



Notes:

The four pieces in this puzzle comprise a logically complete set. This set is defined as follows: arrange three unit squares so that every square shares exactly half an edge with any other square.

Each side of the tray has a unique solution.

48

Stacked Pieces Puzzle Ring

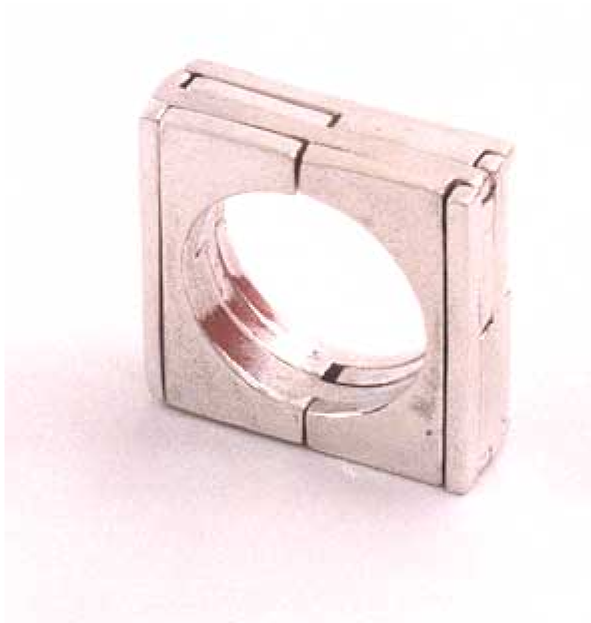
Puzzle Goal:

Assemble a puzzle ring from the four pieces

Materials:

Sterling silver

Classification:



49

Stealth

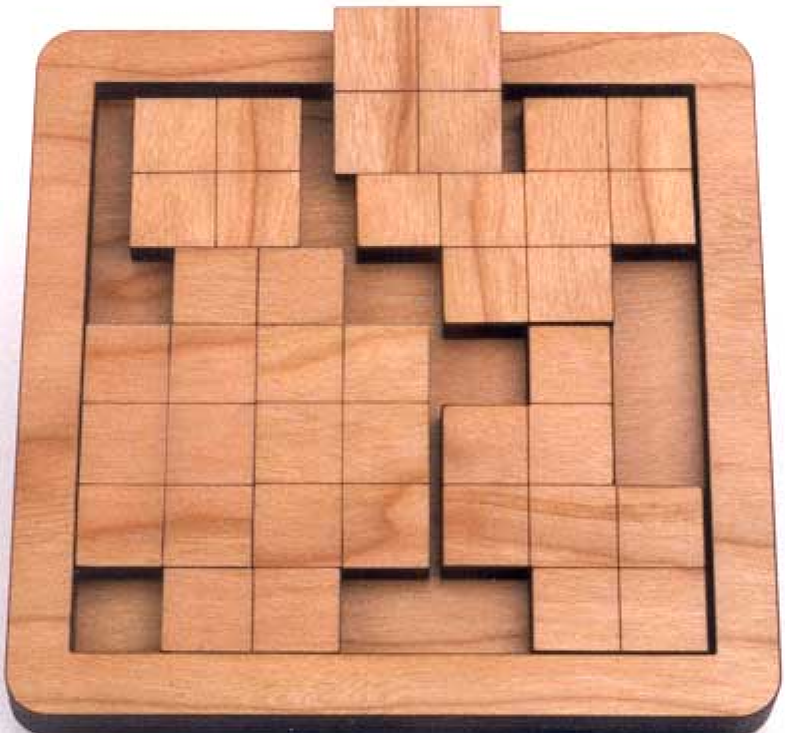
Puzzle Goal:

Pack the 4 octominoes and 2 tetrominoes flat into the 7x7 square tray.

Materials:

Cherry wood

Classification: Put-Together



50 Strip Tease

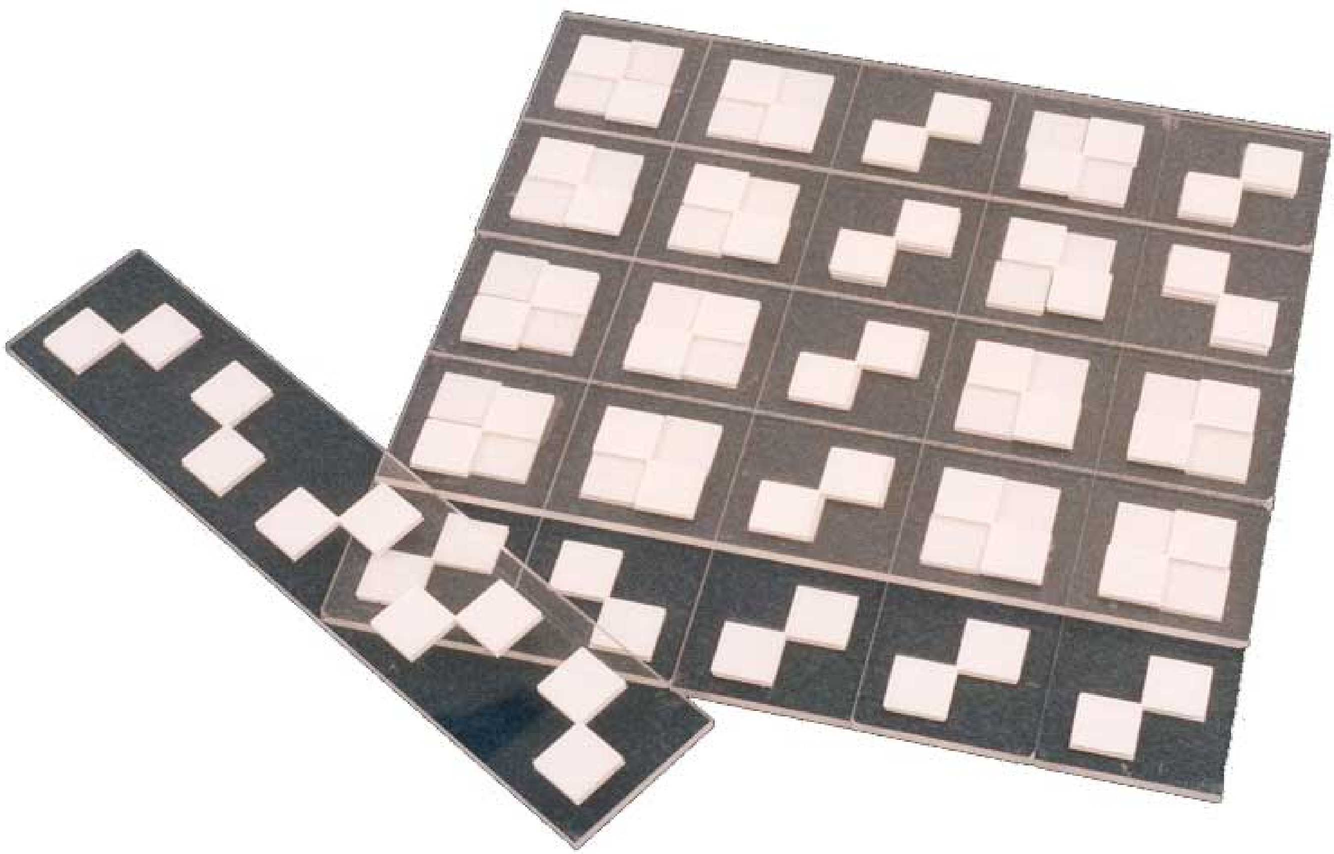
Puzzle Goal:

The purpose of the puzzle is to place 5 strips horizontally and 5 strips vertically so that a pattern of 25 full squares results.

Materials:

Clear acrylic

Classification: Put-together



Notes:

Each strip consists of 5 patterns of 2 diagonally place one-quarter squares. Each strip is different and only 10 different strips exists (all included).

51

Taxi

Puzzle Goal:

Take the two pieces apart. Then put them back together again, forming one complete taxi.

Materials:

Maple with Mozambique inlay

Classification: Take-apart, route finding

Notes:

The pegs holding the cars are delicate; please take care not to force the puzzle in any way.

52 Tetralott

Puzzle Goal:

Assemble the seven puzzle-pieces to a ball pyramid (tetrahedron). To connect the pieces use the additional pins.

Materials:

walnut

Classification: put together

Train of Gears

Puzzle Goal:

Set the 11 given gears on each of the eleven pegs such that if you spin any of the four wheel gears, all of the other wheel gears will spin in the same direction.

Materials:

plastic

Classification: Assembly puzzle, ASS-OTH

Notes:

The instructions above more precise than that given on the puzzle.

54

Tricolore

Puzzle Goal:

Assemble the six pieces into a three dimensional cross, respecting the colors of the three pairs of pieces. Rotation of the pieces is neither necessary nor allowed.

Materials:

Wood, Walnut (dark wood), Hard Maple (light wood), and Jotaba (aka Brazilian Cherry), decorative splines from the same three woods.

Classification: 3.4 Burrs

History:

This puzzle is one of the products of an extensive research where all six board burrs were calculated. This is one of the four "most interesting" designs discovered.

Triplets

Puzzle Goal:

Disassemble, and then reassemble, the pieces into the shape of the classic Three-Piece Cross

Materials:

Zebrawood finished with Velvit Oil.

Classification: Interlocking Puzzle

History:

I was looking for new ways to make puzzles based on the traditional Three-Piece Cross (or Wooden Knot). This investigation led to an article in Cubism For Fun ("Analysis of the Three-Piece Cross", CFF 53) and a very interesting, level 8-4 design by Frans de Vreugd (Three Piece NOT).

Triplets was an offshoot of this work, something I did one day to relieve the tedium of manually trying combinations of pieces for the above-mentioned work. I had tried earlier (as had many others, I found later) to create a 3x3x3 cube puzzle with three identical pieces. I thought I might have better luck with the shape of the Three-Piece Cross. I built up the basic piece with cubes, using Gordon Lingard's program, Interlock. Once I had a shape that I thought would work I used André van Kammen's program, Puzzlesolver, to look for unexpected, easier solutions. I was surprised to find the solution was unique.

Later I saw a design on a Japanese website that creates a six-board puzzle using the same dissect-and-reattach approach. This puzzle, named "Crooked 6 Board Burr", was designed by Junichi Yananose, and the pieces are similar in design.

56

Twin Cubes

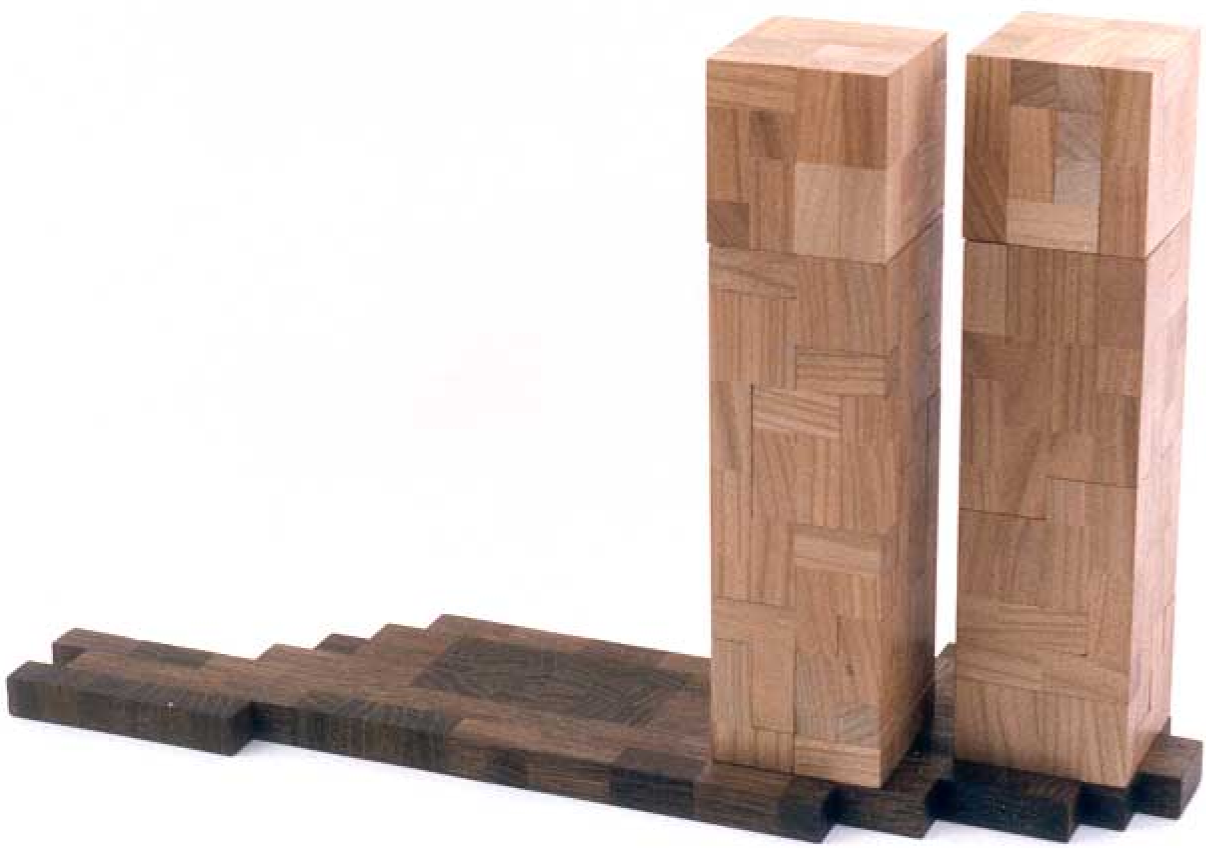
Puzzle Goal:

Assemble each of the two cubes. Additionally, each of the presentation towers can be disassembled and reassembled.

Materials:

Cubes and towers: cherry wood; Manhattan: wenge and oak.

Classification: interlocking



57 Twist

Puzzle Goal:

Construct four differently colored intersecting rings fitting inside a rhombic dodecahedron.

Materials:

Black Walnut, White Ash, Mahogany, Jatoba

Classification: put-together/ INT-OTH

History:

The idea was born after making a copy of the Twelve Piece Twist burr. This construction can be regarded as three orthogonally intersecting (square) rings. Translating this concept to other polyhedra gave birth to the Twist. It works for both the rhombic dodecahedron and the rhombic triacontrahedron as they have rhombi as faces. I chose the dodecahedron for more rigidity.

58

Twisted Burr

Puzzle Goal:

Assemble the burr.

Materials:

Teak

Classification: Take apart

Notes:

There are two completely unique assembly techniques.

Two Brothers

Puzzle Goal:

Remove the metal ring.

Materials:

Birch wood, metal ring and polyester rope

Classification: Disentanglement

60

Visible Box

Puzzle Goal:

Open the box.

Materials:

Cherry, Bloodwood

Classification: Take-apart Puzzle

61

ZigZag

Puzzle Goal:

Assemble the six pieces into a shape described as "separated board burr".

Materials:

Lasercut acrylic pieces

Classification: 3.4 Burrs