

Puzzle Cube Design Brief

Client: Fine Office Furniture, Inc.
Target Consumer: Ages 7+
Designer: Intro to Engineering Design Students

Problem Statement:

A local office furniture manufacturing company throws away tens of thousands of scrap $\frac{3}{4}$ " hardwood cubes that result from its furniture construction processes. The material is expensive, and the scrap represents a sizeable loss of profit.

Design Statement:

Fine Office Furniture, Inc. would like to return value to its waste product by using it as the raw material for desktop novelty items that will be sold on the showroom floor. Design, build, test, document, and present a three-dimensional puzzle system that is made from the scrap hardwood cubes. The puzzle system must provide an appropriate degree of challenge to a person who is three years of age or older.

Constraints:

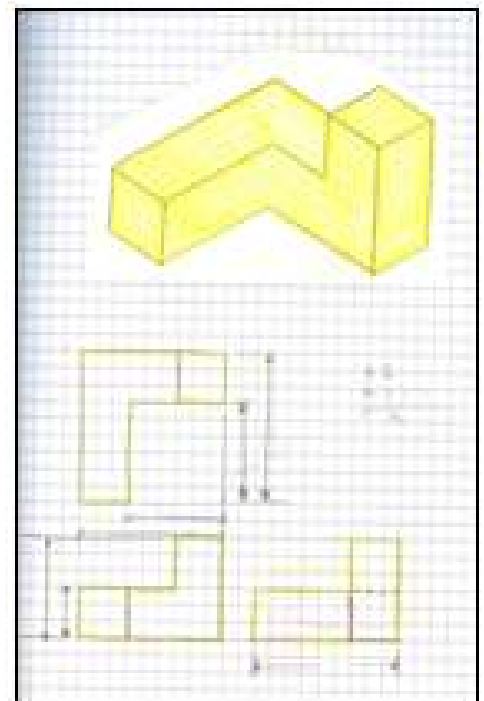
1. The puzzle must be fabricated from paper cubes.
2. The puzzle system must contain exactly **five** puzzle pieces.
3. Each individual puzzle piece must consist of at least **four**, but no more than **six** cubes that are permanently attached to each other.
4. No two puzzle pieces can be the same.
5. The five puzzle pieces must assemble to form a 3 x 3 x 3 cube.

Procedure:

1. Brainstorm the best possible solution by arranging snapping cubes.
2. Take a digital photo of your cube and its parts. Remember we will be sketching and building the cube from your photos!!
3. Assemble your cube, have your teacher check it.

Constraint	Met Constraint
5 pieces	
4-6 cubes each piece	
No repeats	

4. Sketch each piece in isometric, oblique, and Multiview.



Rubrics:

Drawings (3)

30 Points (10 points each)

Isometric (5 pieces each drawn on Isometric paper)

Oblique (5 pieces each drawn on graph paper in Oblique style)

Multiview (5 pieces with side, top, and front drawn on graph paper)

Paper Box

20 Points

Size – how well does the cube fit?

5 Points

Package Construction (no holes, lid fits tightly)

10 points

Overall Design – name, drawing, colorful

5 points

Must include your name, a drawing, colorful package, and good design.

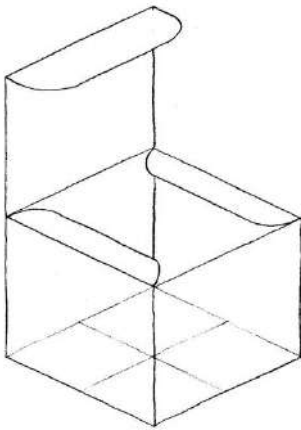
The box must be a reusable package.

Must contain a lid that can be sealed.

No open areas are allowed. Paper must completely seal in the entire cube.

The user must be able to insert and remove the puzzle cube easily.

The box must be a snug fit (no wasted area).



Paper Cube

50 Points

Cube pieces are well built and square

up to 20 Points

Cube pieces fit together as a 3x3 Cube

up to 20 Points

All pieces are different colors

10 Points