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Contents

Introduction	1
Foundation 3D	3
1 Three Rectilinear Elements.	4
2 Three Curvilinear Elements.	6
3 Complex Organization	8
4 Puppet: Marionette, Hand Held, or Stick Manipulated	10
5 Character of Line.	12
6 Character of Plane.	14
7 Character of Volume	20
8 Space Study Incorporating Line, Plane and Volume	24
Sophomore 3D	27
Construction Problem	28
Convexity Problem	30
Junior 3D	39
Negative Cube	40
Convexity/Concavity	42
Musical Instrument	44
Letter Cube and Extrusion.	46
Pouring Forms	46

Abstract Visual Relationships

The Industrial Design curriculum of Pratt Institute is unique in its emphasis on teaching 3D visual abstraction. This core experience has been integral to our program since the department was formally established. Rowena Reed Kostellow was instrumental in formulating the problems that structure this approach. They span the entire four year education of our students.

The following is an outline of the curriculum I teach. It has evolved over the years, and the examples shown are the results of this endeavor.

First Year

- 1 Three Rectilinear Elements
- 2 Three Curvilinear Elements
- 3 Complex Organization of Rectilinear and Curvilinear Forms
- 4 Puppet: Marionette, Hand Held, or Stick Manipulated
- 5 Character of Line
- 6 Character of Plane
- 7 Character of Volume
- 8 Space Study Incorporating Line, Plane and Volume

Second Year

Organization of Multiple Forms: Construction Problem
Organic Form: Convexity Problem

Third Year

Negative Cube
Product Design: Musical Instrument
Convexity/Concavity (Optional)

Foundation 3D

The WHAT and HOW issues of three dimensional design are explainable and teachable. The WHY results from each individual's confident creative enthusiasm to self-express him or herself in three dimensions.

The content of this course focuses on an investigation of a 3D vocabulary that is abstract in it's offering and the bulk of its problem solving. The issues are basic to any understanding of three dimensional visual phenomena. They are as "universal" and non-verbal or culture specific as possible. They are about the forms and space of our experience.

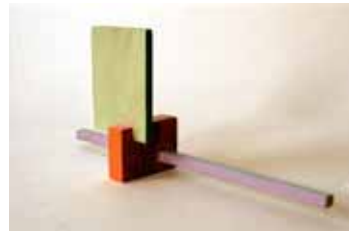
This class is not a concentrated one year art program. The content is predicated upon a belief that some of the students will continue to explore these issues on a more advanced level. Others will find that the abstract content has application to those disciplines not manifestly three dimensional. In any case, the work is offered as a piece of education and not an end in itself. It is a complement to the other course work being offered. All work is part of a vocabulary of creative dialogue—between me and the students—but most importantly, between the students themselves.

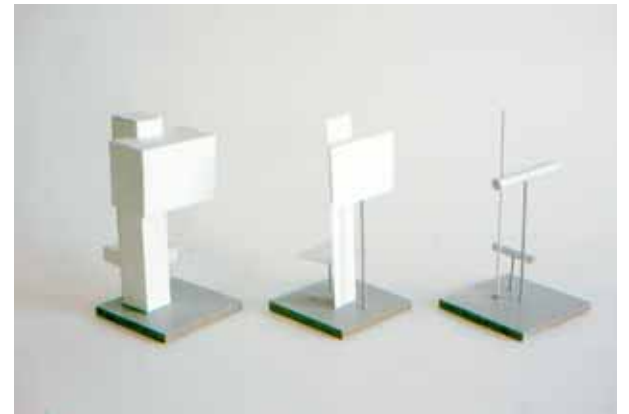
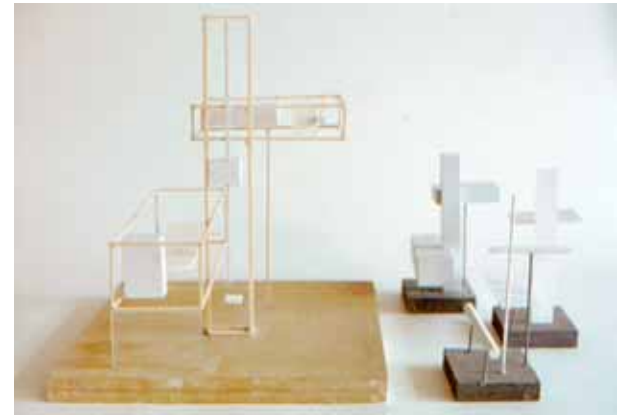
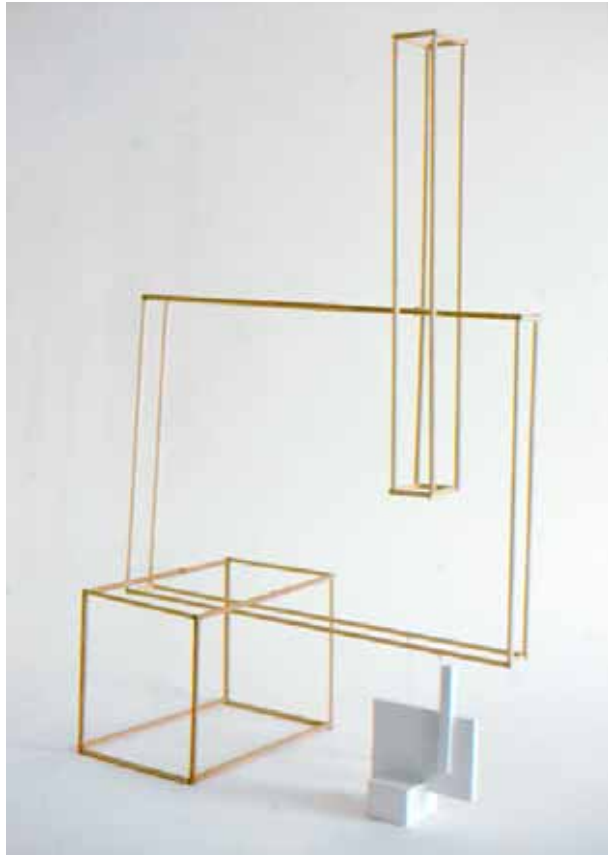
1 Three Rectilinear Elements

This problem is an introductory exploration of some elementary 3D issues.

Differences:	Character	Size
	Line	Dominant
	Plane	Sub-dominant
	Mass	Subordinate
Axial or Directional Form:	Rectangle - specific directional axis	
Neutral Form:	Square - non specific directional axis	
Composition:	Symmetrical balance	
	Asymmetrical balance	
	Right angle relationships	
Joining:	Cradling	
	Piercing	
	Notching	
Axial Movement:	locating three directions in space with three axes of forms;	
	Directing eye to move through the main part of all three forms.	
Materials:	Clay, chipboard, wood	
	Plaster	
	Styrene plastic	

Two point perspective drawing of project, with color application on three different surfaces of each of the three elements.





FOUNDATION 3D

2 Three Curvilinear Elements

This problem continues the issues introduced in problem 1—emphasis is on asymmetric dynamic balance (no right angle relationships):

Line
Plane
Mass

Dominant
Sub-dominant
Subordinate

Sphere
Cylinder
Cone
Egg

Asymmetrical balance

Dramatic contrasts

Physically joined

Axial continuity between all three elements – defining a group by movement

Materials: Clay, chipboard, wood, plaster, plastic

Flip book (50 index cards) based on design





3 Complex Organization

Ties together information explored in problems 1 and 2.

Working with five or seven mixed (rectilinear and curvilinear) elements, develop a design that has character and personality. The sum of the elements should be visually interesting.

The composition should contain two groups (mixed pieces) of odd numbers, mutually dependent upon each other to achieve total balance. Apart, each would be incomplete. Design should be vertical or horizontal overall. Not neutral.

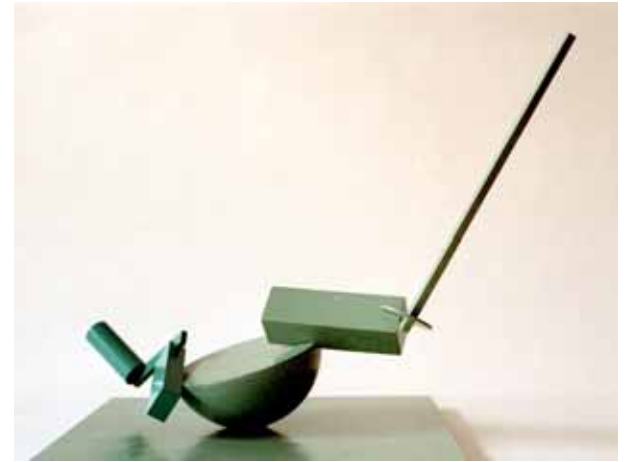
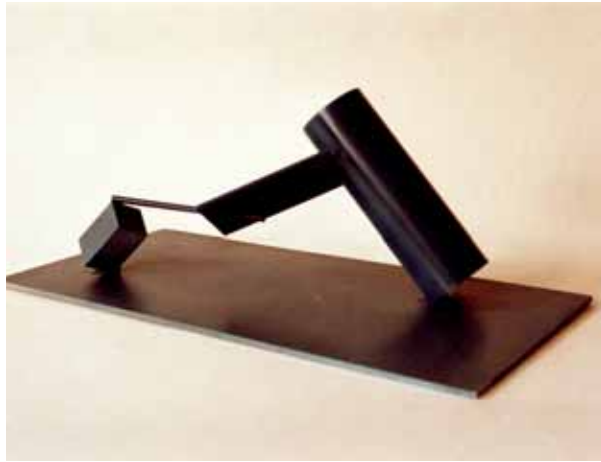
Dominant form of total in one group – sub-dominant in the other group. Each should be different from the other (rectilinear/curvilinear and line/plane, plane/volume, or plane/line). Variety and contrast should be evident in the subordinate elements.

Visual tension across space should be demonstrated.

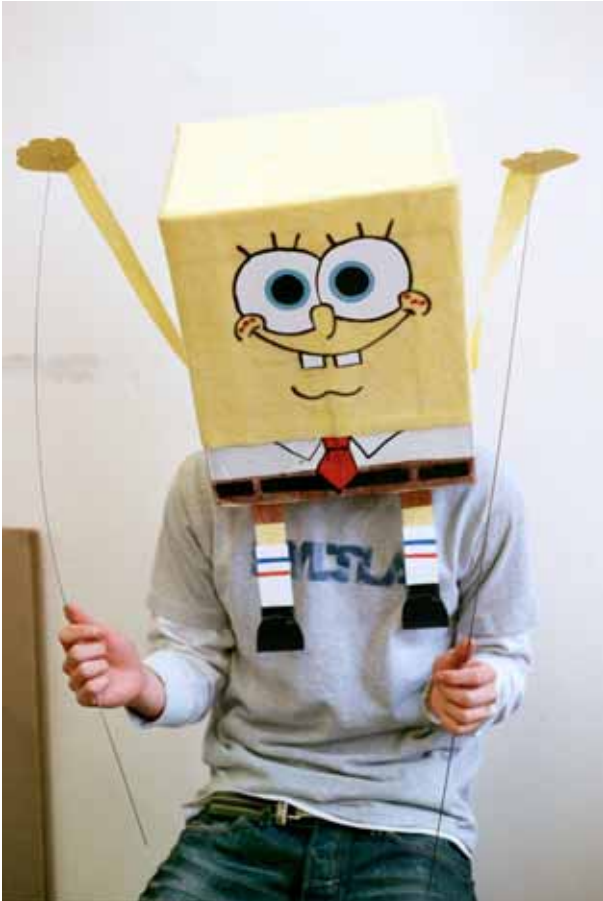
Materials: Clay, chipboard, wood, plastic.

18 x 24 mosaic collage to be presented with final design.





4 Puppet: Marionette, Hand Held, or Stick Manipulated





5 Character of Line

Materials: 24 gauge copper wire
spring steel wire rods

Pure Abstraction:

Five different lines (three curves, two straight)

- Lines different in character and proportion
- Dynamic gesture
- Asymmetric balance
- Tension across space between accents of curves

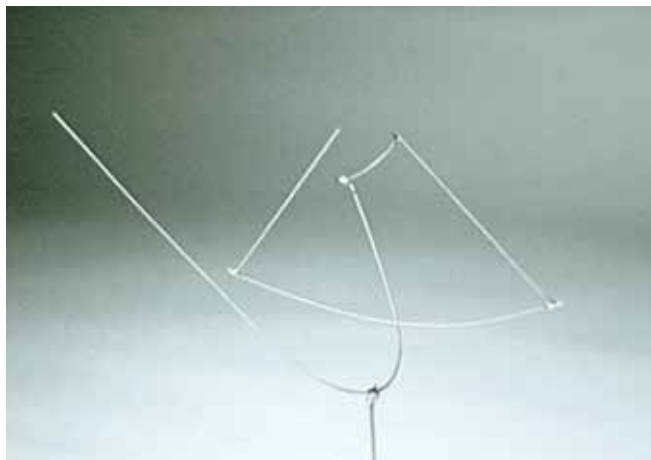
Caricature – self portrait

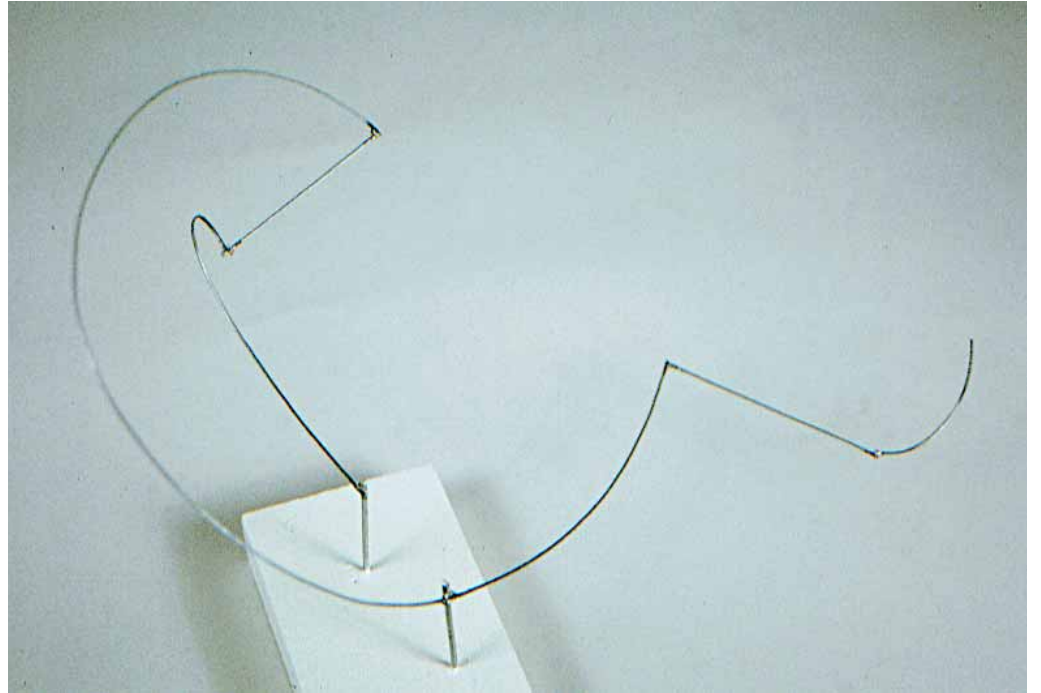
Animal or bird abstraction

Mobile balance – incorporating non-linear elements

Reference: The Dot and the Line – Norton Juster

Video: Interview with Al Hirshfield





6 Character of Plane

Explore planes in Space

Bending and folding flat planes - shaping edges to follow bends and folds.

Curving planes - shaping edges to compliment axial movement of plane.

Accenting curved surfaces - by curvature and edge definition.

Window pane design: Abstract planar construction interacting with natural light.

Light Design: Interaction between artificial light source and abstract planes.

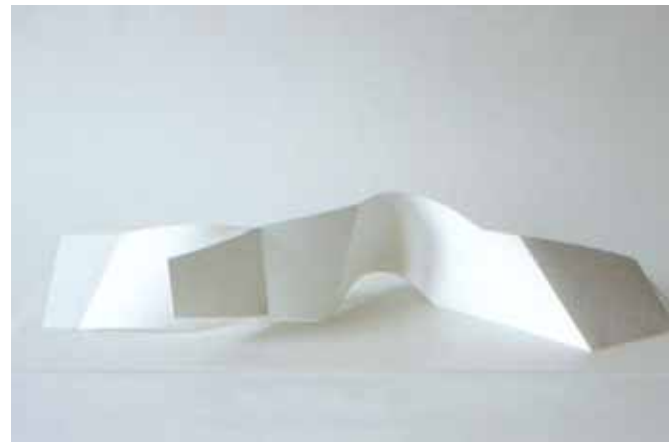
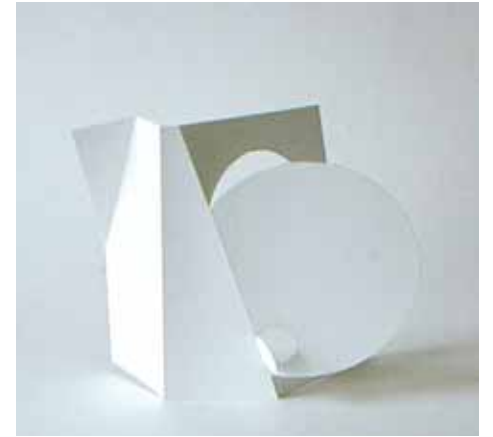
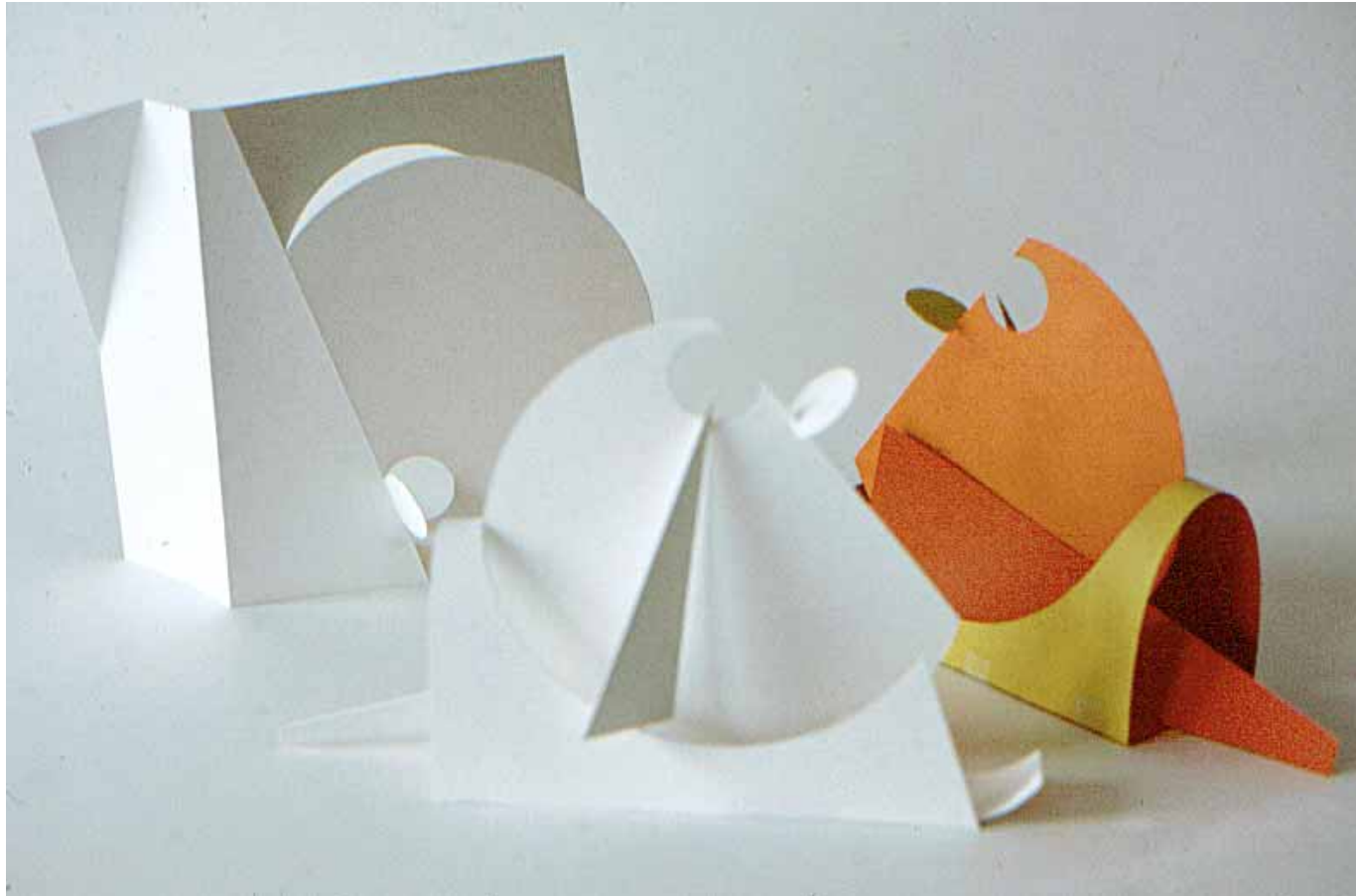
Hat: Plane as fashion.

Architectonic: Design a wall structure with different planar elements.

Self Structure: 11 x 14 bristol board – 3 scores, 2 cuts – self standing structure (with the addition of text a self promotion piece)

Materials: Chipboard, bristol board, glue, tape.

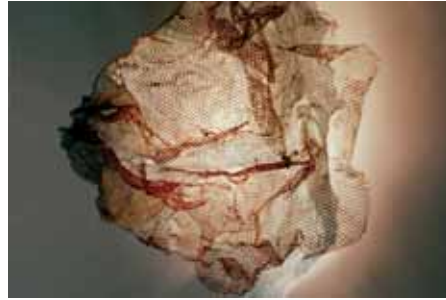
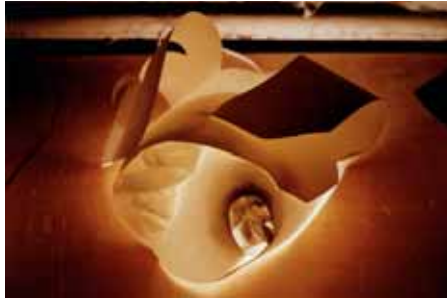




6 Character of Plane

Light Design





6 Character of Plane Hat





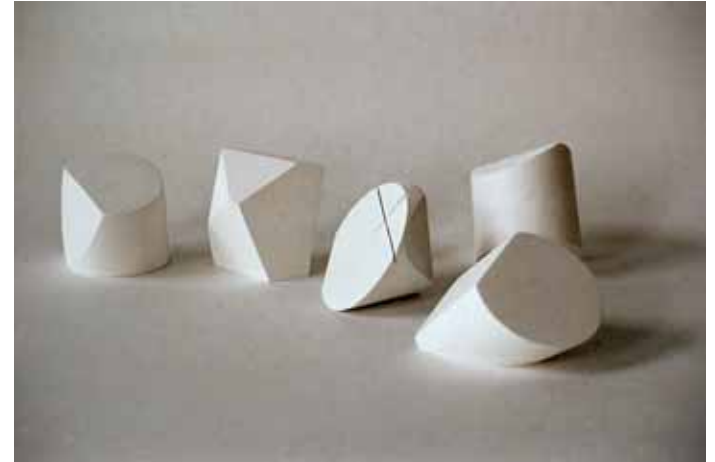
7 Character of Volume

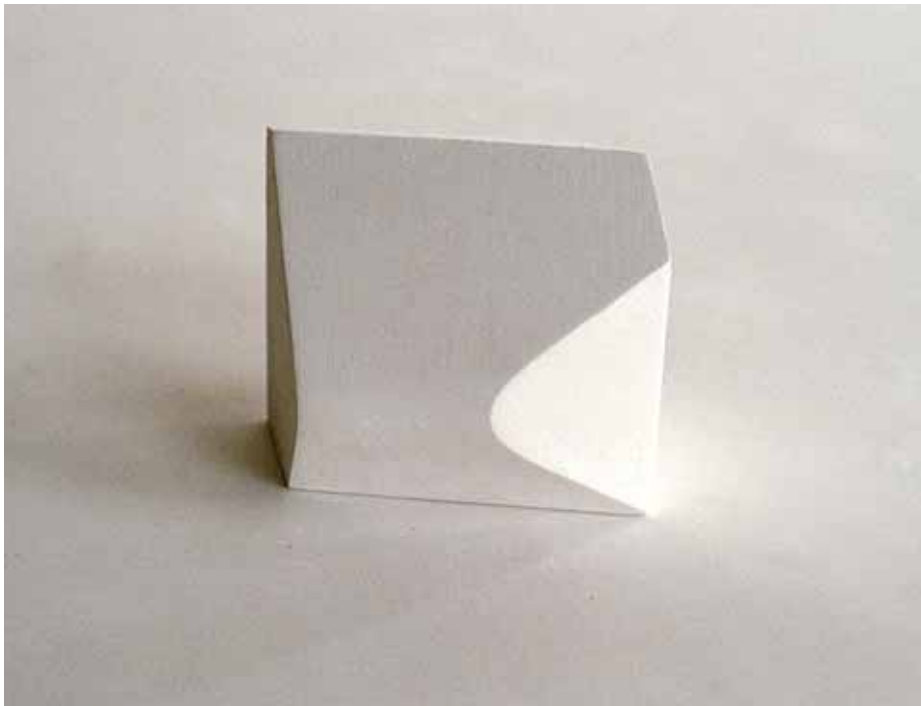
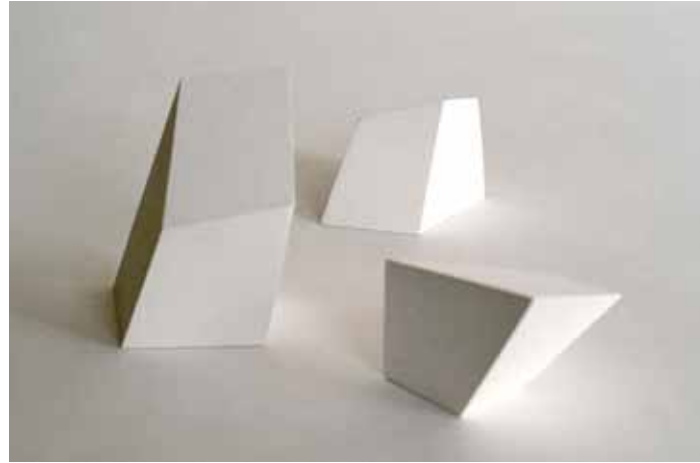
Explore the relationship between axis, surfaces and outline of form.

Two plaster rectangles – two plaster cylinders.

1. Shift axis of rectangle by adjusting top and bottom surfaces. Adjust other surfaces to complete form;
2. Curve axis of rectangle by shaping long surfaces. Adjust ends to complete form;
3. Bend axis of cylinder;
4. Design a volume using the last cylinder.

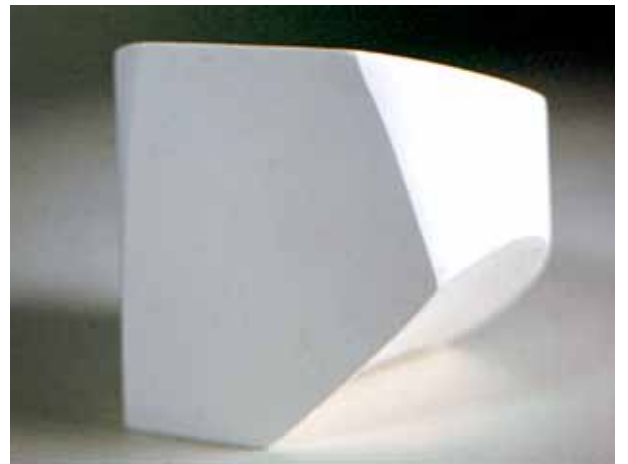
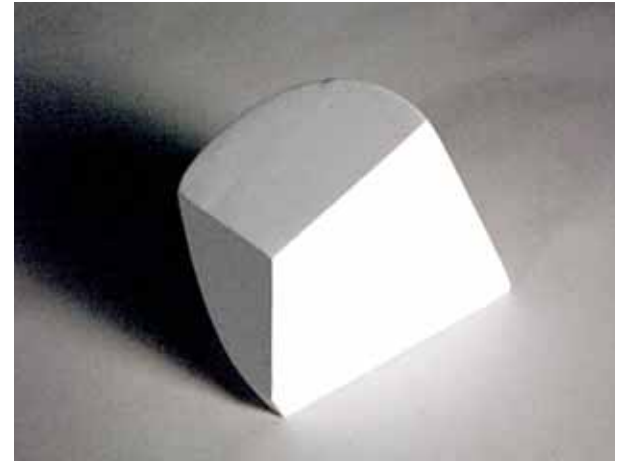
Four 18 x 24 graphics - one each of the form exercises, employing a different style and medium of expression.

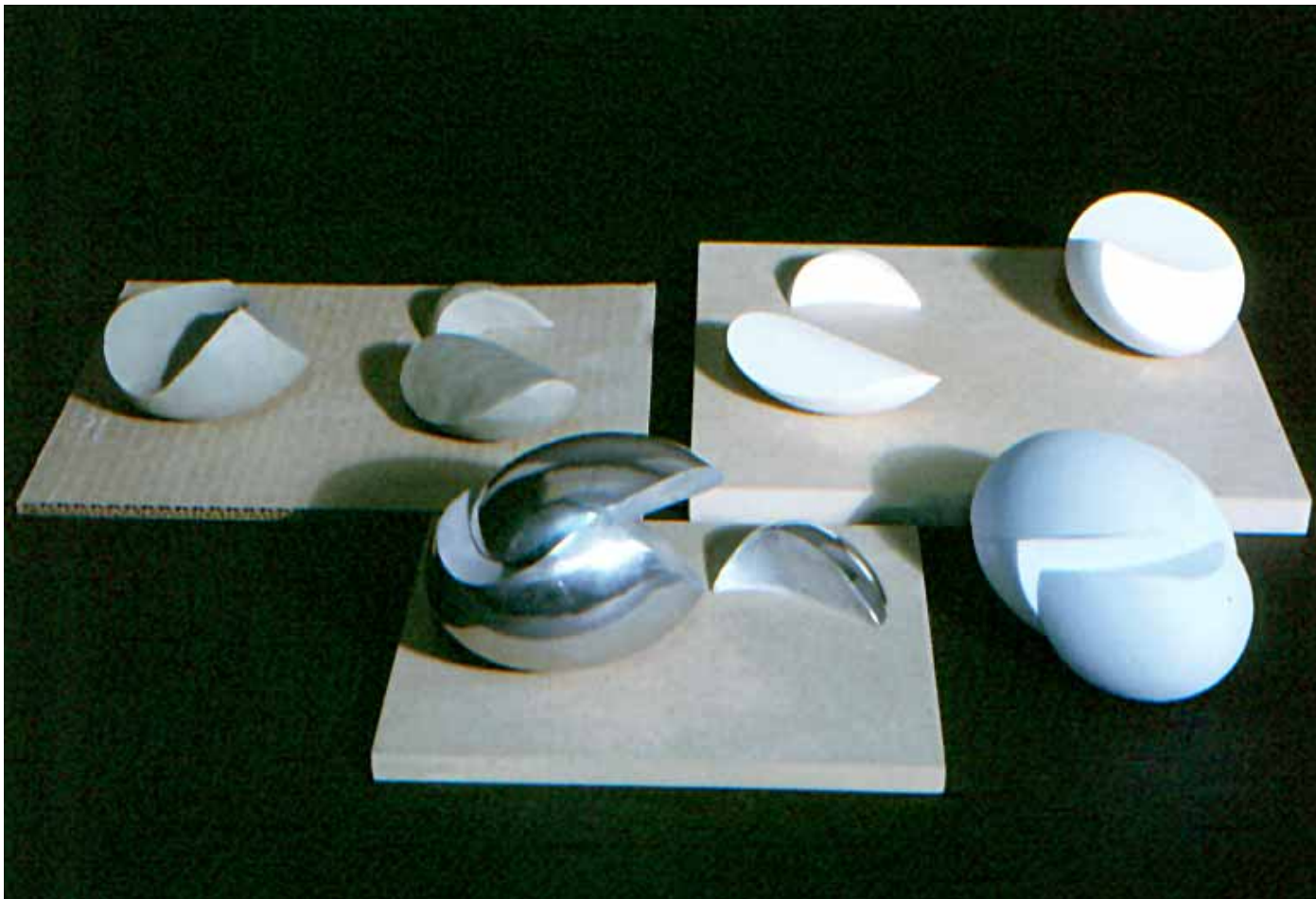
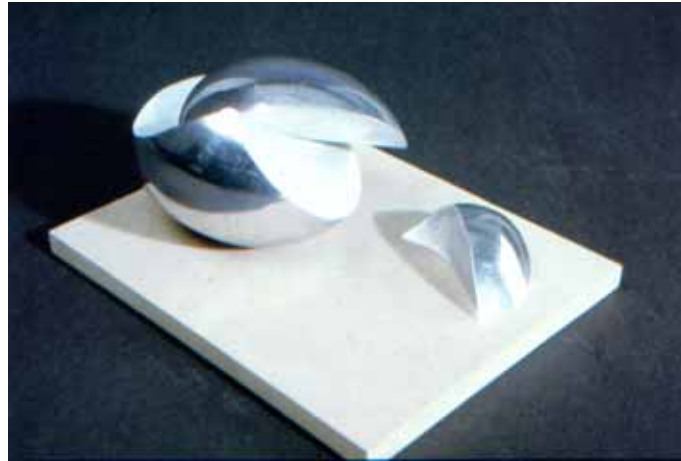
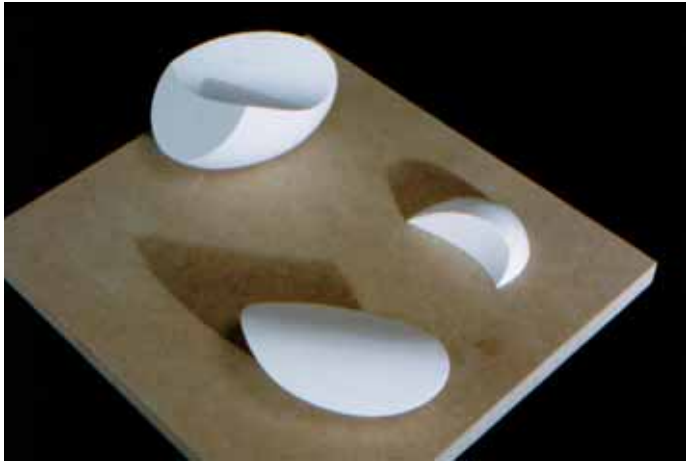




7 Character of Volume

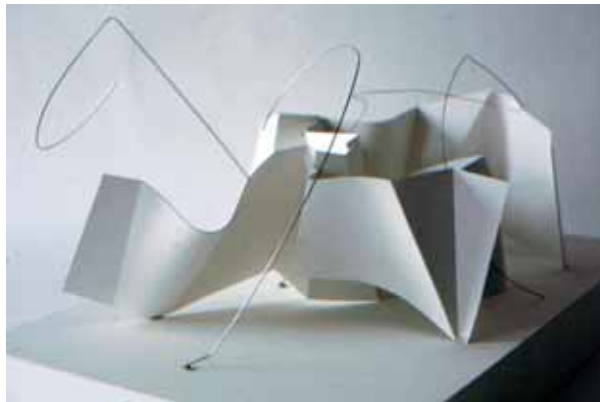
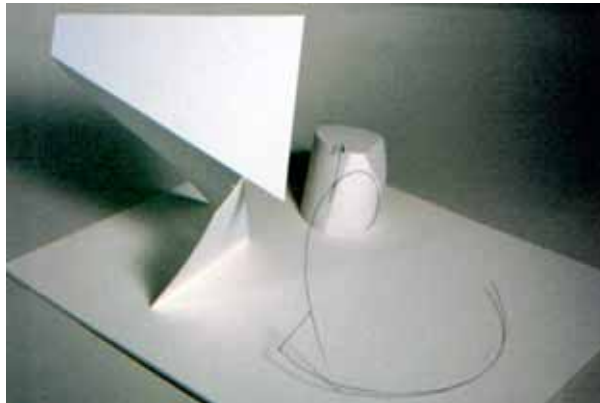
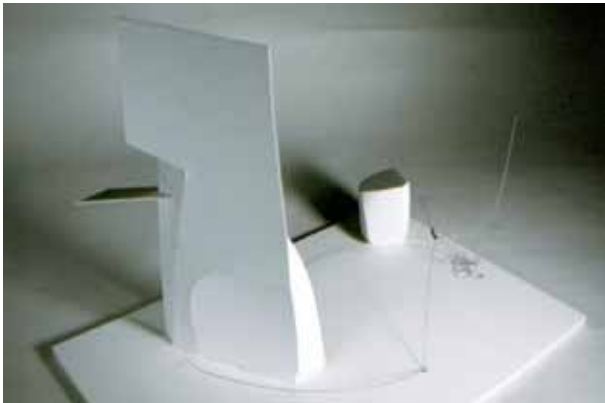
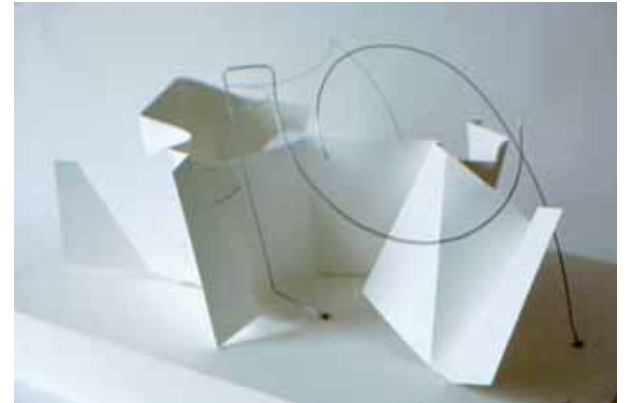
Volume Fragment

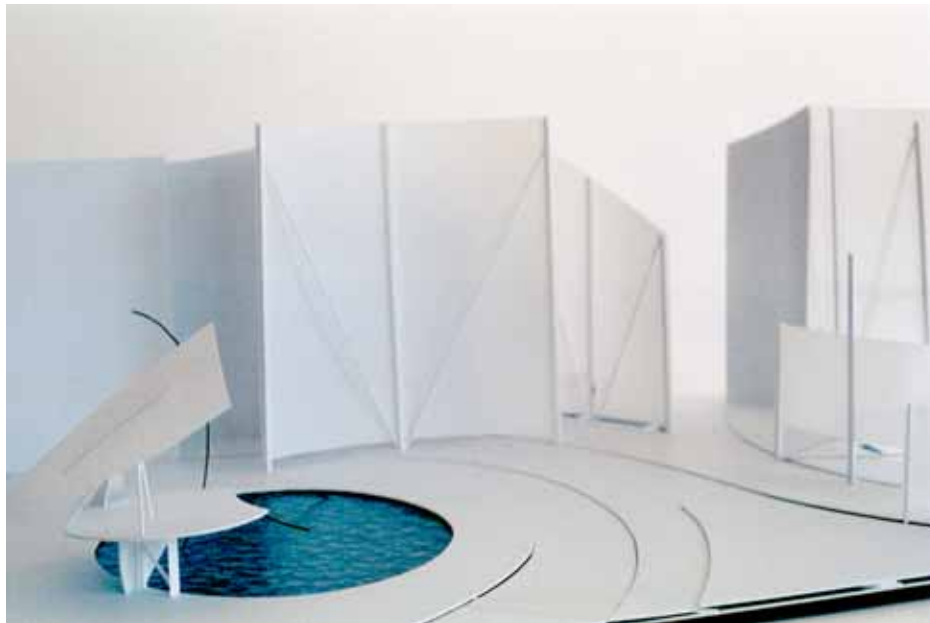
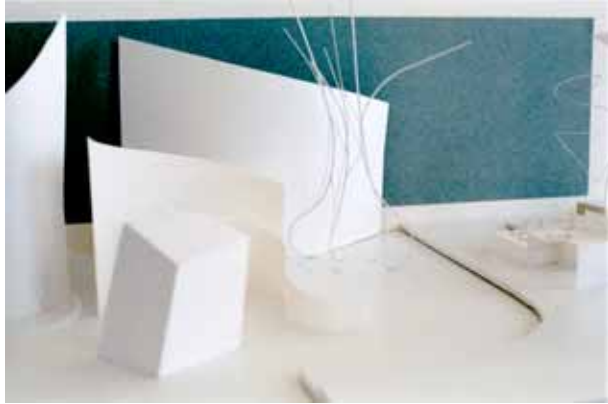




8 Space Study Incorporating Line, Plane and Volume

Compose a 24" deep x 36" wide x 16" high space incorporating line, plane and volume.
(In 2002, twelve students designed a memorial for the WTC.)





Sophomore 3D

Three dimensional design is a required year of study in the sophomore curriculum of the Industrial Design Department. It is based upon a previous year of 3D studies that explore some basic fundamental principals. Two semester-long projects are required. Both involve an initial sketching phase, an analysis phase, and a final presentation.

Construction Problem

This problem explores the world of assembled elements that man designs and makes. The bicycle, vacuum cleaner, food blender, coffee maker are but a few of the objects in our daily life that are made up of multiple pieces and parts. The construction problem is an introduction to this world. It is approached through the study of abstract visual relationships that combine elements that are different in character and size. The aim of the problem is to design an object whose sum is more important than the pieces that visually define it - and yet completely dependent upon each element to create that sum. Visual harmony is the goal.

Convexity Problem

Visual volume, or mass, is defined by the relationship of the surfaces that contain it. This problem explores the nature of organic form. The relationship between axial gesture, surface tensions across space, and resulting silhouette is investigated.

Four exploratory problems initiate the process of investigation. These are small clay and plaster studies that demonstrate how a volume can be adjusted in position and in character by manipulating the surfaces. Two rectangles and two cylinders are used.

Sketching three dimensionally emphasizes establishing forms of character and personality. Selecting a form of visual interest then permits an exploration of what defines the character of that form - through an investigation of variations and permutations. Empathic drawing is an essential corollary. Axes and surface studies follow. Enlarging the form in clay is a prelude to reducing down from a pre-cast plaster form the final design.

Construction Problem

An important part of the world of Industrial Design is about products and objects that are made of multiple elements. This problem, employing visual abstraction as the alphabet, attempts to lay the groundwork for such practical problems as may surface later.

Method:

Sketching: Critical to the process is the development of visual ideas. Using found objects, students are encouraged to create compositions that show variety and contrast – line, plane, volumes with size differences that signify a hierarchy of strength and importance. These sketches should read as sum statements. Emphasis is on the total, rather than the parts.

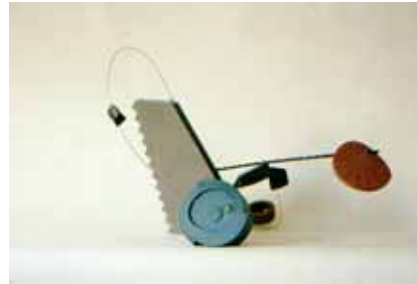
Analysis: Empathic drawings, variation and permutation studies, axis analysis, grouping configurations, surface studies (all based upon strengthening and improving the original idea) are explored.

Semi Final: A preliminary model of the completed design is made in sketch materials. This model establishes final scale, connections, mechanical articulations, and overall gesture and composition.

Final Model: A finished design is constructed, using materials appropriate to the design.

A mosaic collage is presented with the final design.

* This problem builds upon experiences explored in the first year. Introductory and preliminary problems are covered in the first weeks of the semester to cover material new to some of the students.





Convexity Problem

Clay Studies



Convexity Problem





Convexity Problem
(cont'd)





Convexity Problem

Color Experiment



Junior 3D

All that has occurred previously is employed in the problems posed in this class.

Negative Cube

The negative cube is an 8 x 8 block of plaster with hollow movements carved through it.

The sensitivity of the space is the result of the treatment of the surfaces that define the hollows. Surfaces are continuously curving, with no hard edges internally (except those created when intersections of tunnels occur). It is an in-class project, worked on once a week for the whole semester.

A six foot square graphic based on the essence of the cube experience is part of the final presentation.

Outside Assignment: in addition to the cube, a project is assigned that explores some issue related to concavity or negative space. Some typical assignments are:

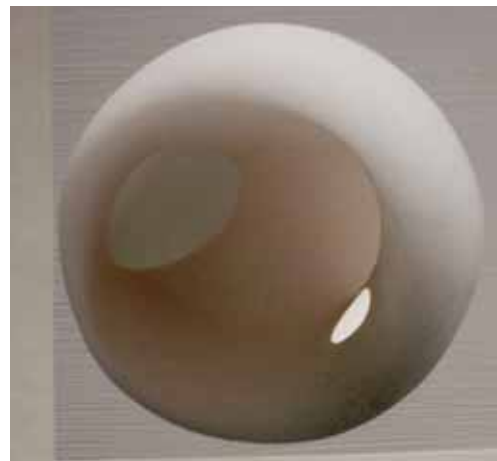
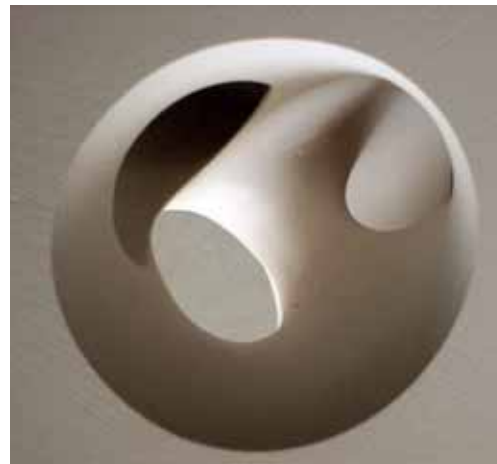
- Musical instrument (product)

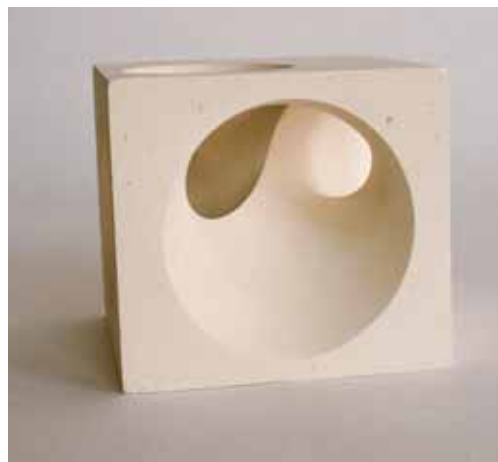
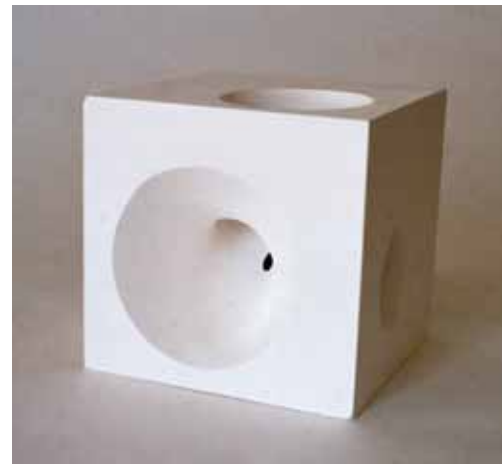
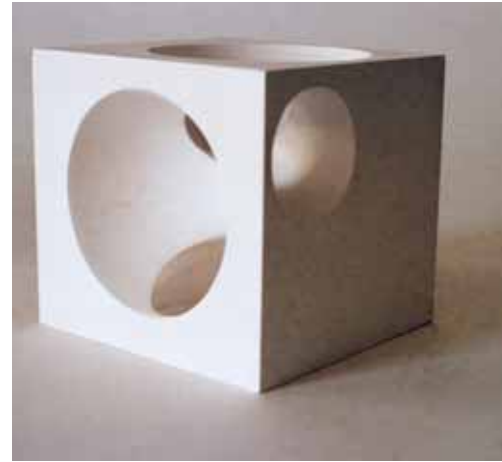
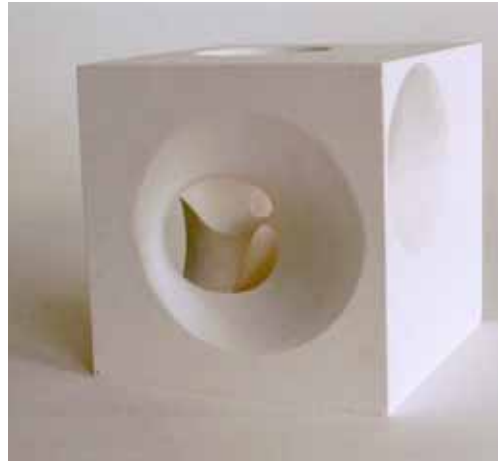
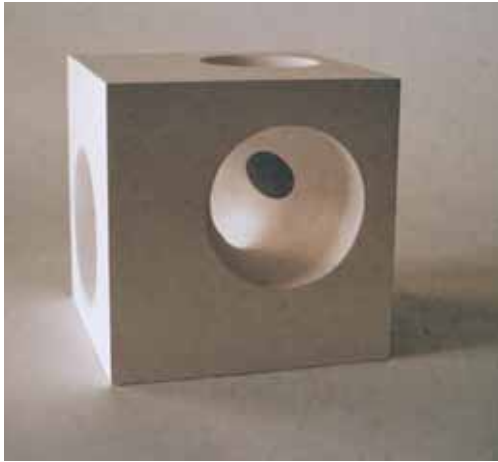
- Letter Cube and Extrusion (packaging)

- Pouring forms (pitchers or pots)

- Bathroom forms.

Negative Cube





Convexity/Concavity

A unified organic volume showing the interplay between expansion and contraction.

Method:

Small clay sketches

Variations based on selected sketch

Empathic drawings

Axis and surface studies

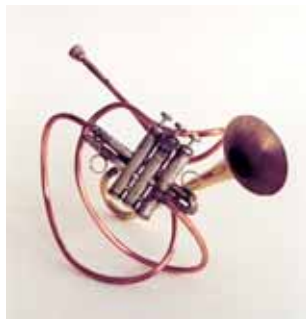
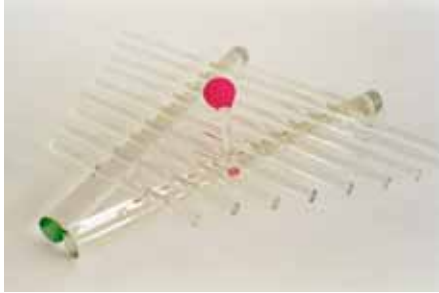
Carving from pre-cast plaster block





Musical Instrument





Letter Cube and Extrusion

Pouring Forms

