WATERLILY

NYMPHAEACEAE /ˌNIMFI:ˈEISI:/

FORM STUDY

Contents

BEAUTY IS THE HARMONY OF A PURPOSE AND A FORM.

ABOUT THIS COURSE

Elements Of Form And Spaces- 3D

Course Learning Outcome:
-To work with modelling materials. -To generate and create new 3-dimensional forms through a process of abstraction, using Gestalt and other design principles. To generate forms that require rationalization and added functional features like stickability, modularity, etc.

1. Form development based on a conceptual theme
Based on an understanding of the relationship between form and nature. -3D modelling of concepts generated.

2. Ideation of forms based on form and space relationship
Demonstrating relationships between the internal void and external form of an object. -3D modelling of concepts generated.

3. Form development based on functional parameter
Based on the relationship between object and human body. -3D modelling of concepts generated.

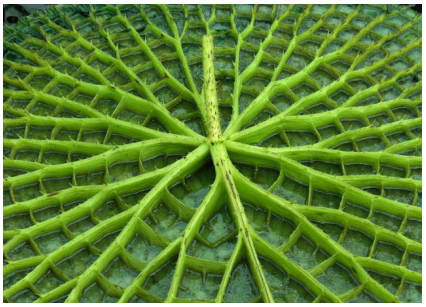
WHAT IS FORM

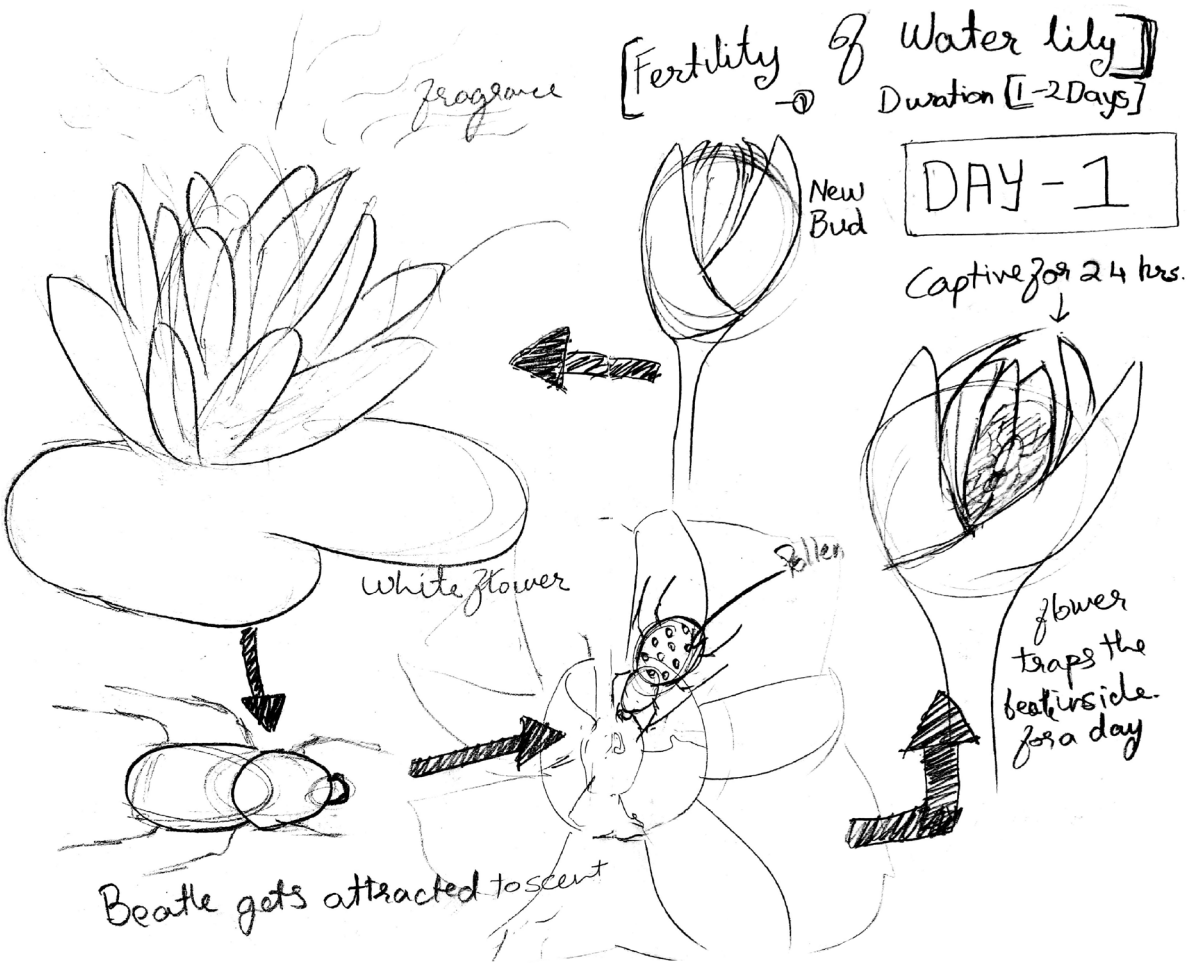
Form is an element of design. For me anything that has three dimensionality and that caries weight is a form. It could be a 2-dimensional drawing or a 3-dimensional object. In drawings weight of line helps five and define form of object we are drawing. Thicker or darker lines usually carries more weight and hence feel heavy, it also suggests lack of light or shadow. Value of color also plays a similar role. Positive and negative spaces play an important role too. With the play of negative and positive spaces interesting forms can be represented with minimal strokes.

Form is negative or positive. A brick-shaped indentation in a wall is a negative form while an exposed brick is a positive form. Form can also be static or dynamic. Static means still, so a pyramid resting on ground is static, while if we rotate it along its height it becomes dynamic.

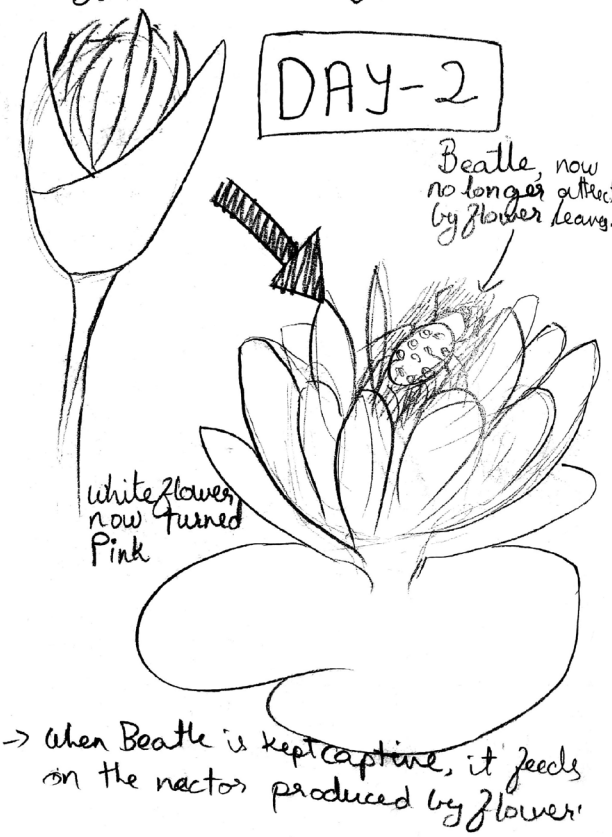
Geometric and organic forms: Geometric forms can be simplified to man-made solids. It is very hard to find these types of forms in nature since these are solids generated by man to better understand and simplify complex forms. Which can be observed in architecture such as buildings and stadium. While organic forms have very free flowing curve, it is hard to represent these in mathematical equations. It is wonderful to see these forms play harmoniously in nature, they're so perfect that you don't notice them unless you're looking for them. Like structure that supports giant leaf of waterlily. Or petals of flower collectively working together to attract pollinators.

While extracting and simplifying or taking inspiration from nature there are certain things one should keep in mind. Its not just about aesthetics, form should serve a purpose or function and should have relevance to the product. One should easily associate with the original subject that it is inspired from. It should be something that once a person associates it with the original subject, they cannot unsee it. In form association plays very important role.





[Death of flower]
Duration: [1-2 Days]

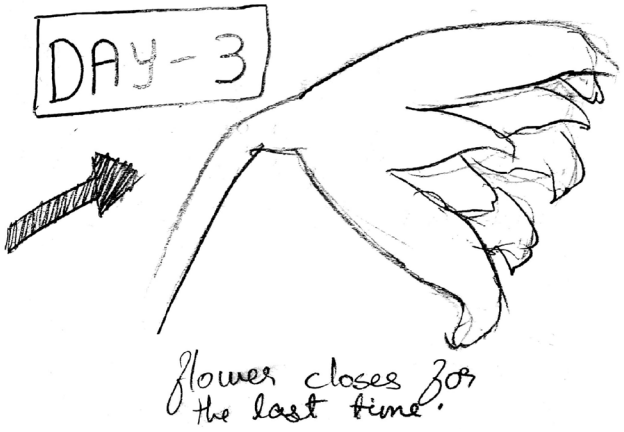


→ when Beatle is kept captive, it feeds on the nectar produced by flower.

→ when Beatle is kept captive, flower showers the Beatle with it's own pollen.

→ Now pink and odorless this flowers no longer is of any interest to Beatle

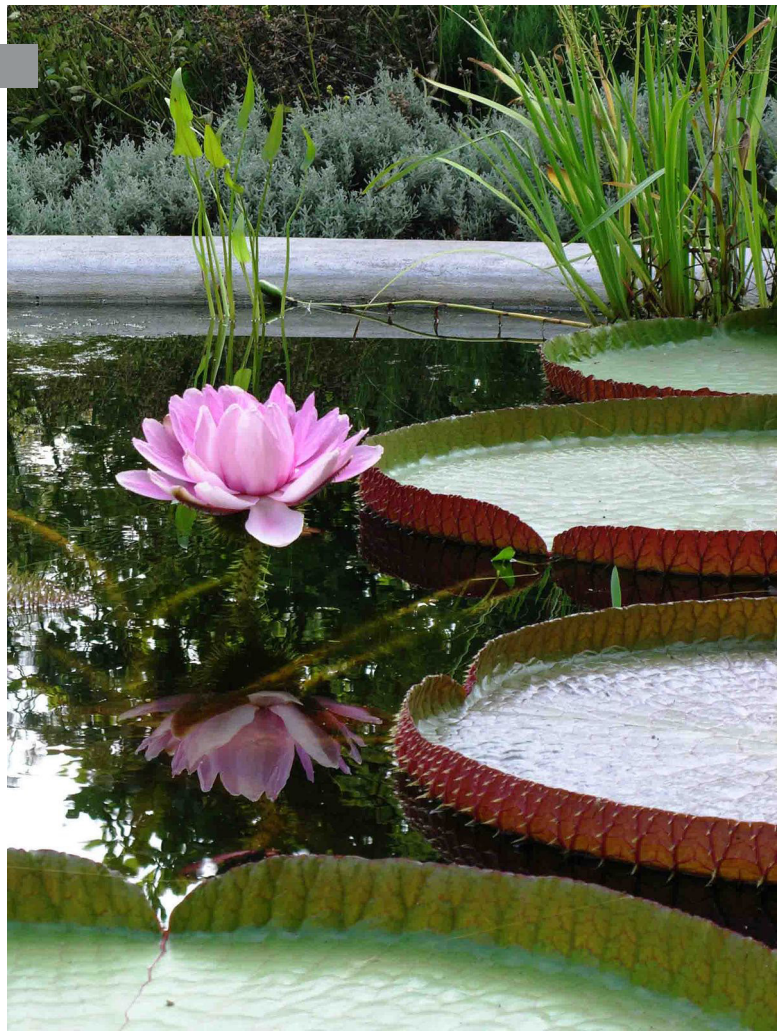
→ Beatle will now carry this pollen to another younger white flower.



It now will retract back to water and rest in the soil underneath

Victoria amazonicaX

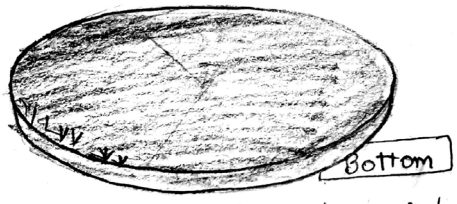
GIANT WATERLILY



Flooded lagoons on the fringes of the rainforest offer an ideal home for a floating giant the Amazonian giant water lily. It is truly a colossus, it has the second largest single leaf of any plant in the world, it grows amazingly fast up to 25 centimeters every day and it's strong enough to support as much as 60 kilos on this 2 meter. Long caiman uses it to lounge in the Sun and the leaves form a perfect fishing platform for a green heron, but it's not just its size that makes this plant remarkable it's how it reproduces. The different colored flowers are the clue. As night falls the white flowers internal temperature rises up to 10 degrees warmer than the surrounding, air that prompts the flower to open. The white flower is female and can't produce pollen, but it does produce a strong sweet pineapple like scent. That aroma attracts a tiny scarab beetle just 2 centimetres long, it's one of the lilies main pollinators. Tt climbs into the heart of the female flower carrying a dusting of pollen picked up from male lily flowers. As dawn approaches the flower cools and closes, any beetle still inside are now trapped but that's no problem. They're safe from heat and danger, and even better they get to spend all day feasting on starchy nectar. As the beetle eats, its load of pollen drops off falling under the flower's reproductive paths. There it triggers a magical transformation the white flower blushes pink and turns from female to male, so that it can now produce its own when night falls. Again the flower opens and the beetle now carrying the newly male flowers pollen escapes to search for another sweetly scented white female Lily. Pollination complete, the pink male flower will die back to a seed and sink to the bottom of the pool. Its fertilized seed will germinate and mature to repeat the water lilies magical transformation next year.

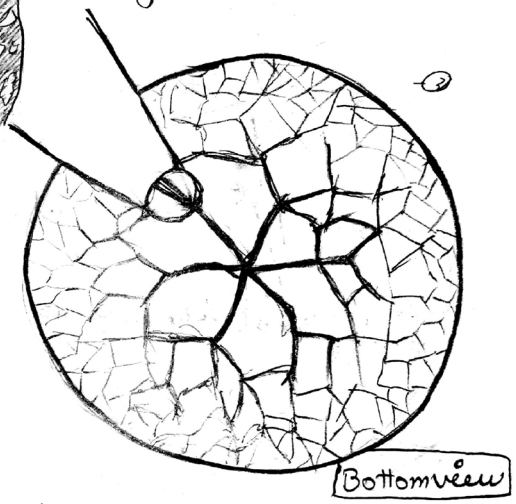
[Lily Pad]

→ Top part of leaf is covered with cuticle to keep dry
→ can hold upto 60 kg
→ Bottom of the leaf is purple in color which helps absorbe different types of light.



→ Thorns protect them from fishs who might try to make a meal out of them.

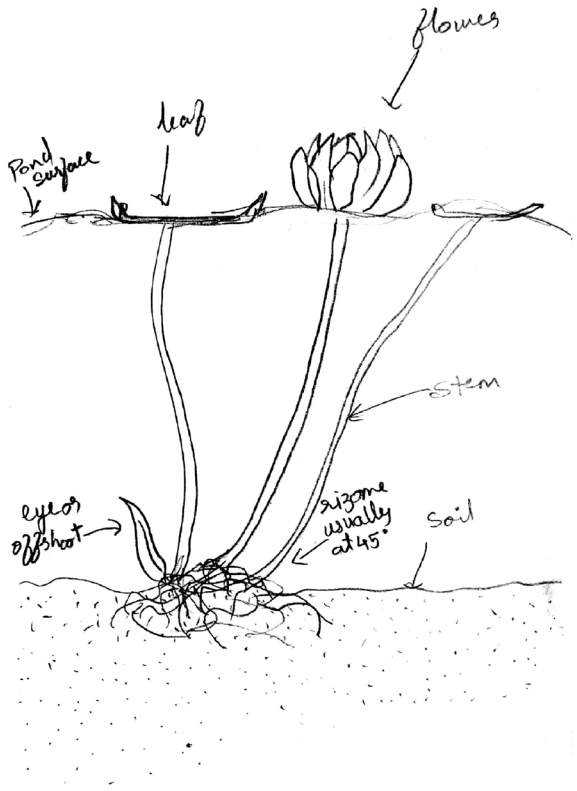
→ Provides stem support helps leaf to stay afloat in water.
→ Boyant and air filled

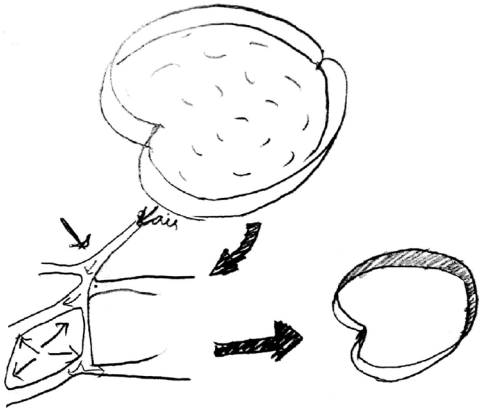


→ To absorb maximum sunlight, these leaves can unfurl upto 7 feet in Diameter
→ Can grow upto 30 cms a day.

Flattening of Crinkles on surface

Air filled girdles - like structure on underneath the leaf.





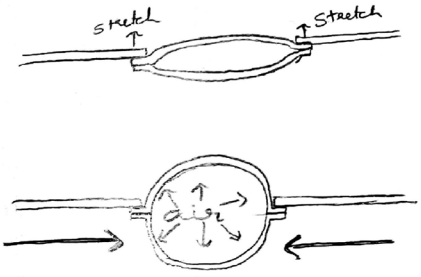
Life Principles

1) Use readily available material and energy.
   * Using air filled petioles for support
2) Fit form to function
   * Large leaves to absorbe more sunlight
3) Replicate strategies that work
   * Trapping beetle inside the flower for a day

Design Principle

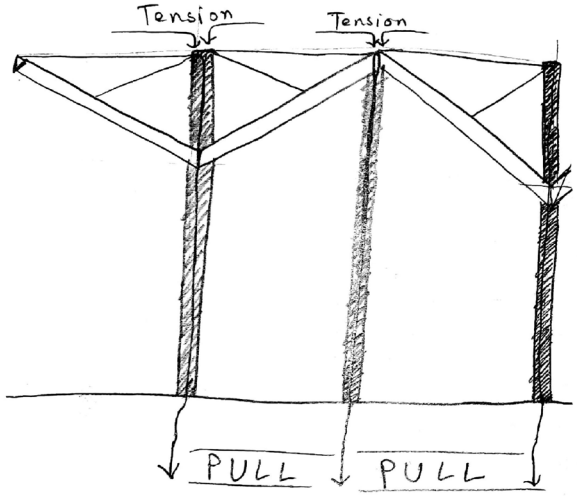
Using air filled web like network for structural rigidity

Stretching mechanism

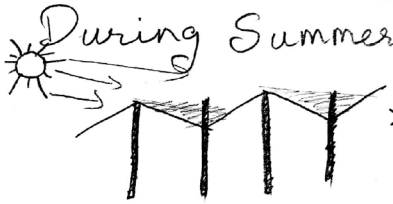


Concept #1: Dynamic Roof for Better climate control

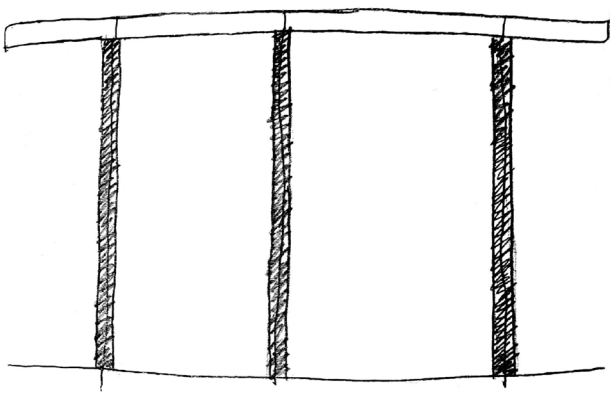
Replicating flattening of crinkles on surface of leaf, and how it affects in absorbtion of sunlight.



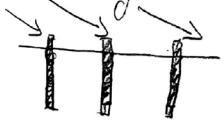
During Summers



* Creates shadow
* Reduces heating



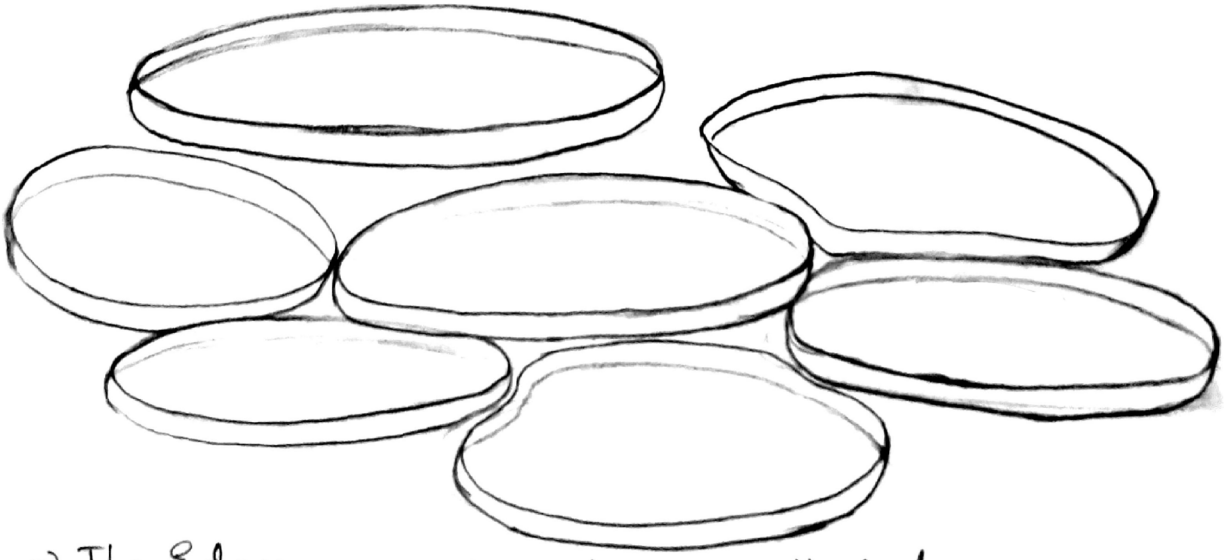
During Winters



* Roof flatens out
* Direct sunlight
* Improves heating

[Domination over Water]

→ Virtually no other plant can live in the shadow underneath

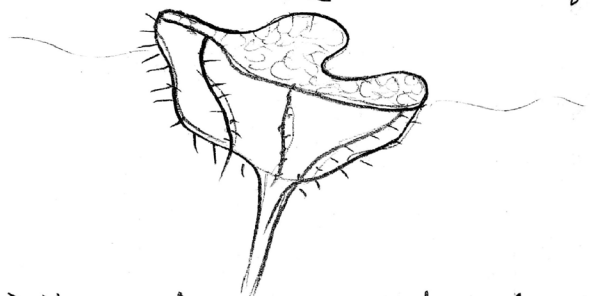


-> The Edges are turned up so that leaf can shoulder aside any competition.

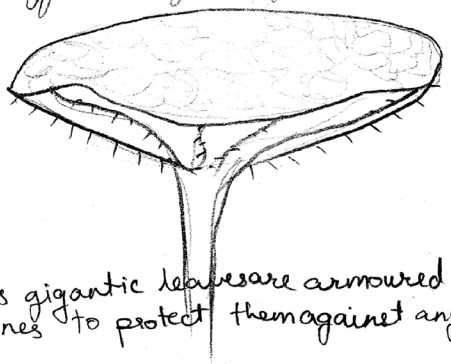
[A fight for light] -②

→ Access to light is a great problem in rain forest

→ Those plants that can command the surface can rule the lake

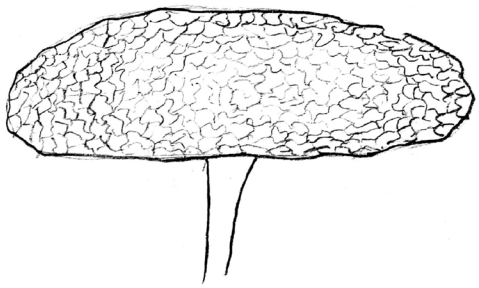


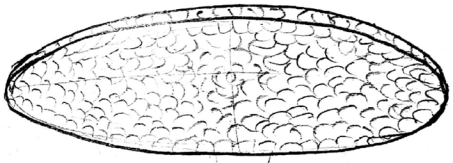
→ Noone does so on a greater scale and so aggressively than giant water lily



-> It's gigantic leaves are armoured with spines to protect them against any fish

→ It's huge expance is kept out stretched and floating on water by boyant air filled struts.

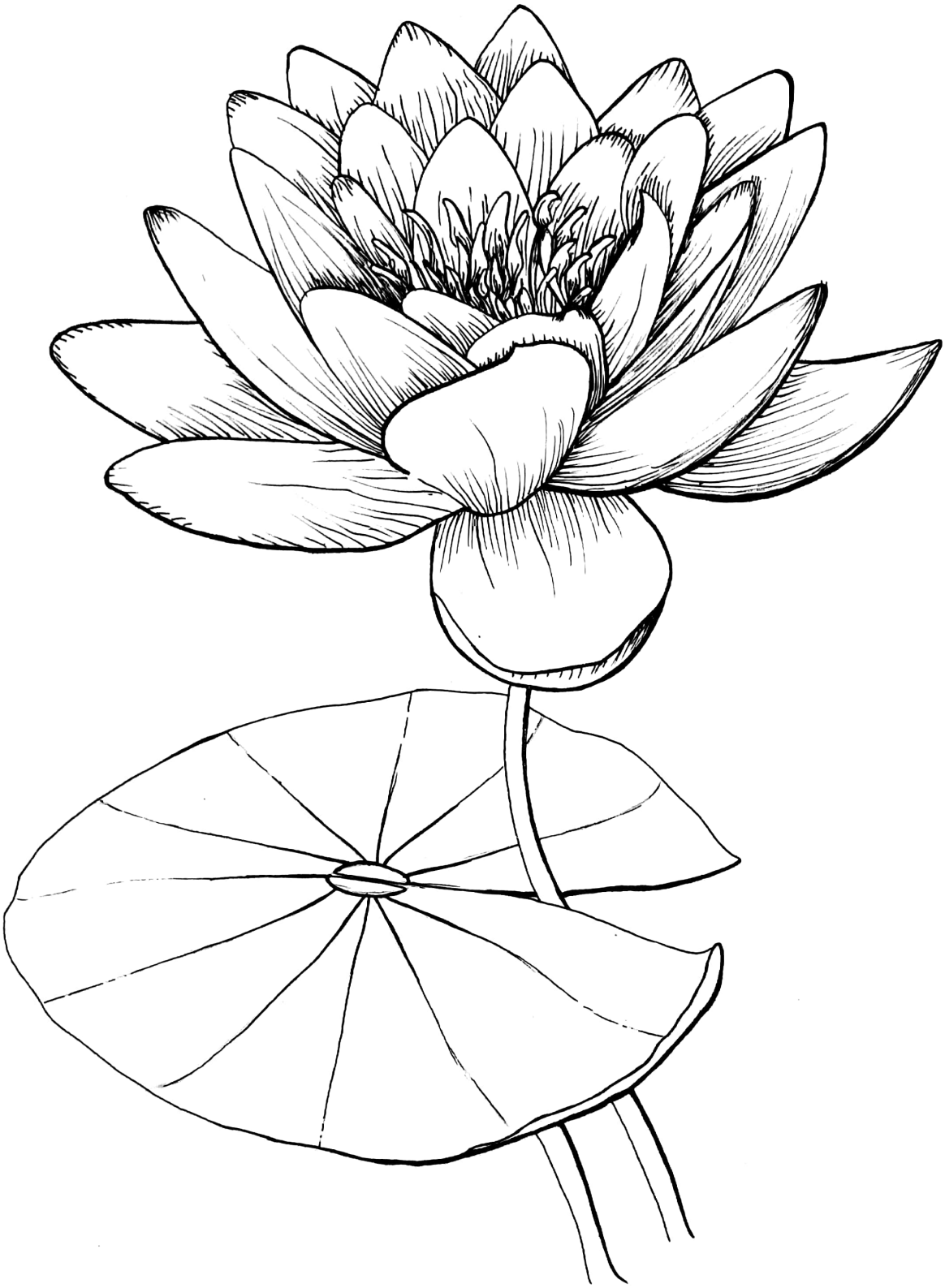




→ the crinkles in surface swiftly flattens out as leaf expands to its full size.

A fight for light

Access to light is the great problem here. Those plants that can command the surface can rule the lake and none does so on a greater scale and more aggressively than this the giant Amazon water lily. It's gigantic leaves are armored with spines that protect them against any fish that might try to make a meal. They're huge expanses kept outstretched and floating on the surface by a lattice of buoyant air filled struts. The crinkles in the surface swiftly flatten out as a leaf expands to its full size. The edges are turned up so that the leaf can shoulder aside any competition. Fully grown a single leaf is six feet across, virtually no other plants can live in the black shaded water beneath these leaves. They cover the surface so completely and the support of their airfield girders is so effective that birds, most famously the lily Trotter can spend their entire lives walking around on them collecting insects. The giant lilies flowers are on an equally monumental scale they're about a foot across.

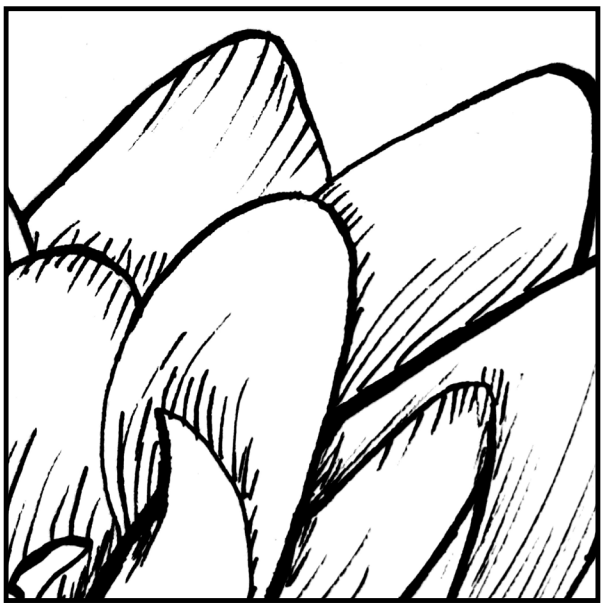


Understanding 2-d form of waterlily

by creating artwork

BALANCE

Here sense of balance is created with help of visual weight and overall symetry.



RHYTHM

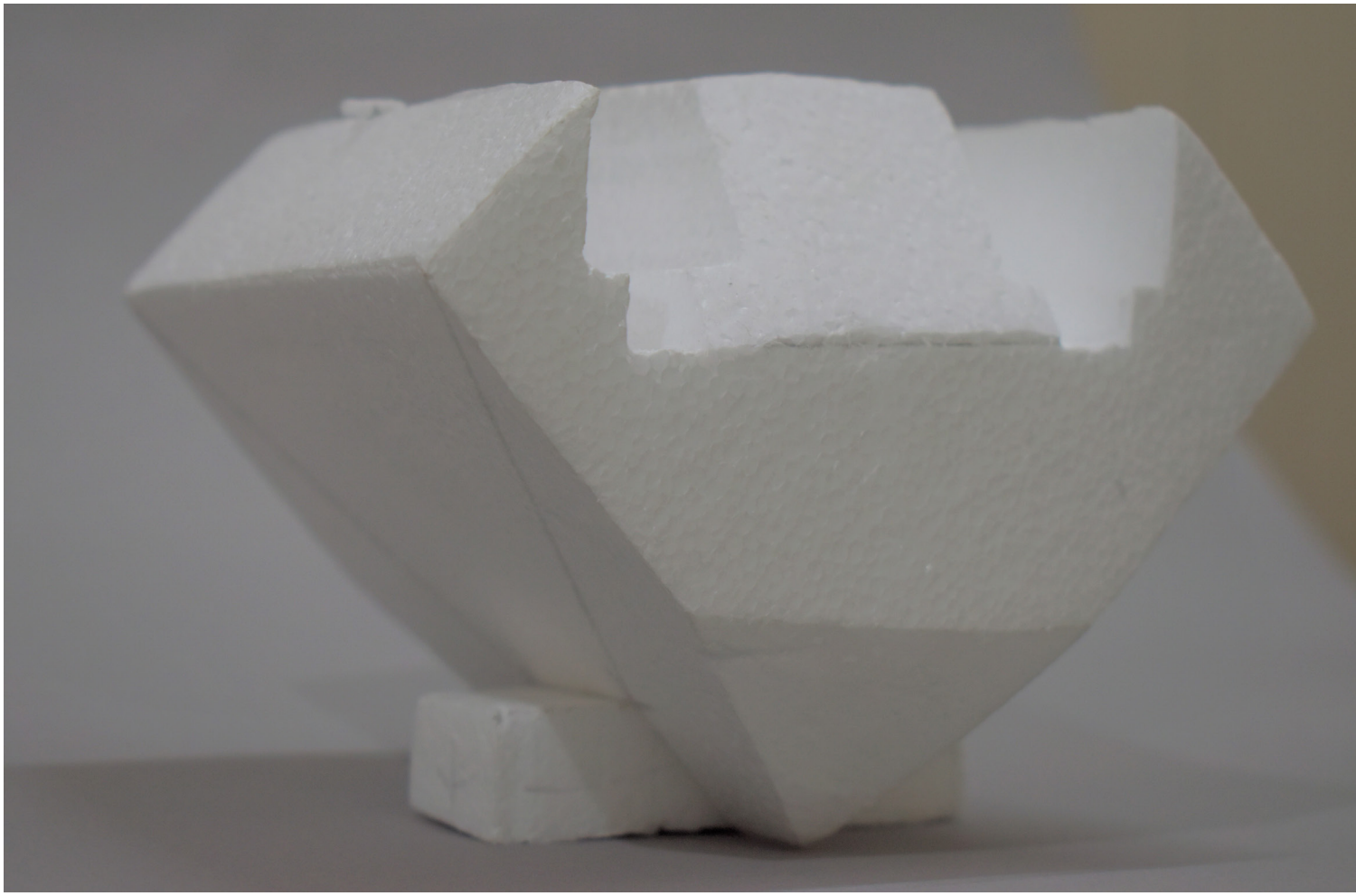
Here rhythm is created with repeatitive curves, which is making the eye move in a rhythemic pattern.

HARMONY

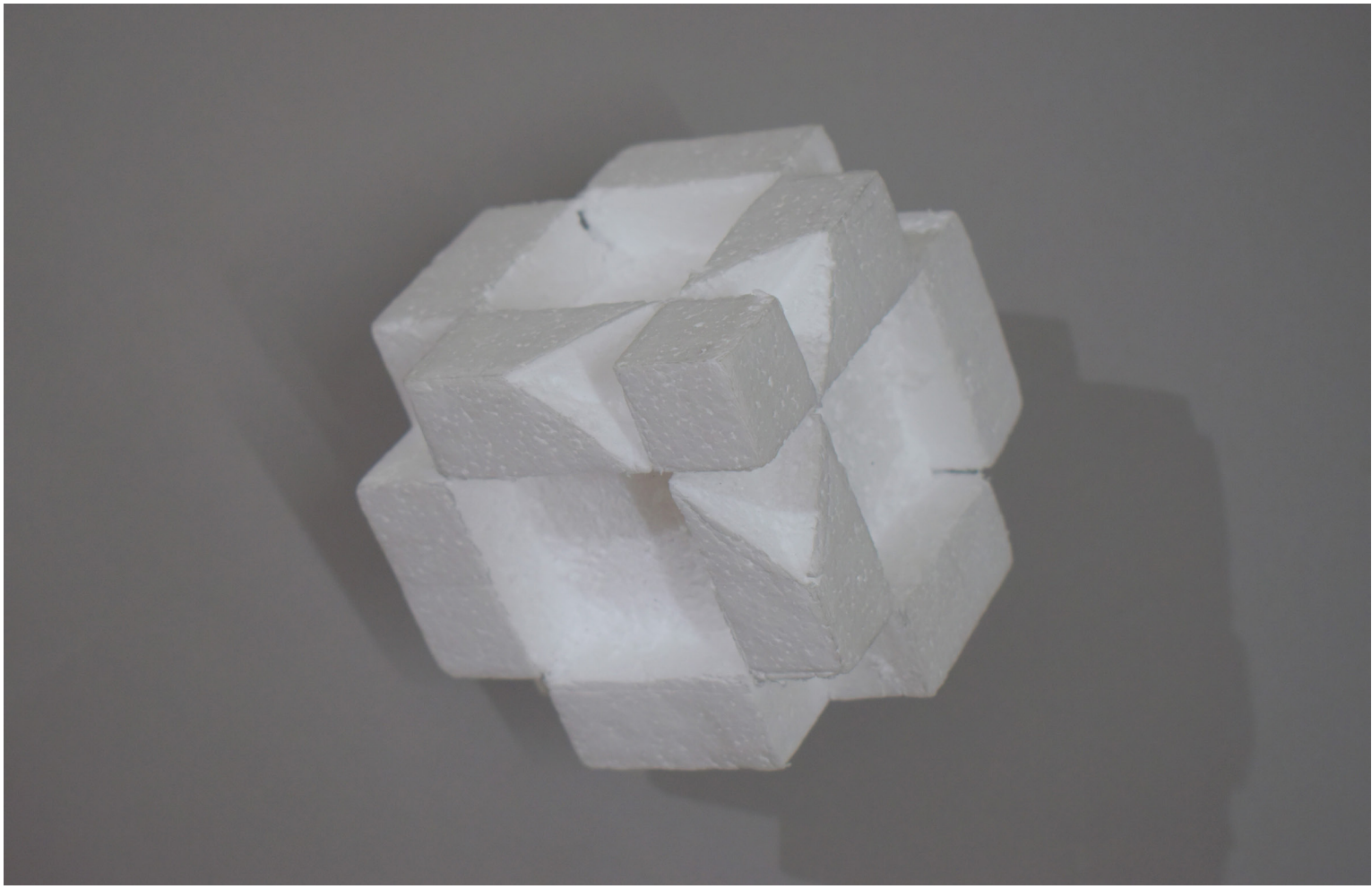
Here the curves on top and bottom with the ones in between are living in harmony.

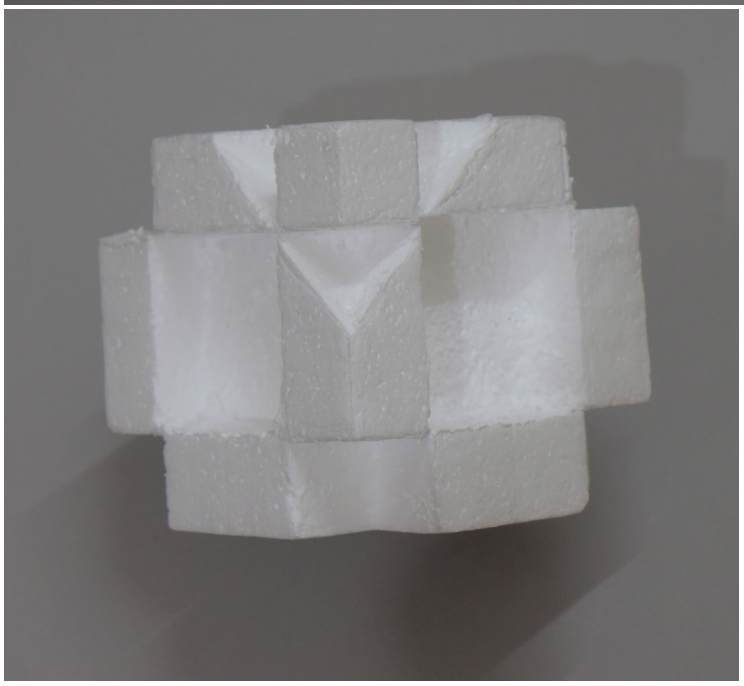
Thermocol Models

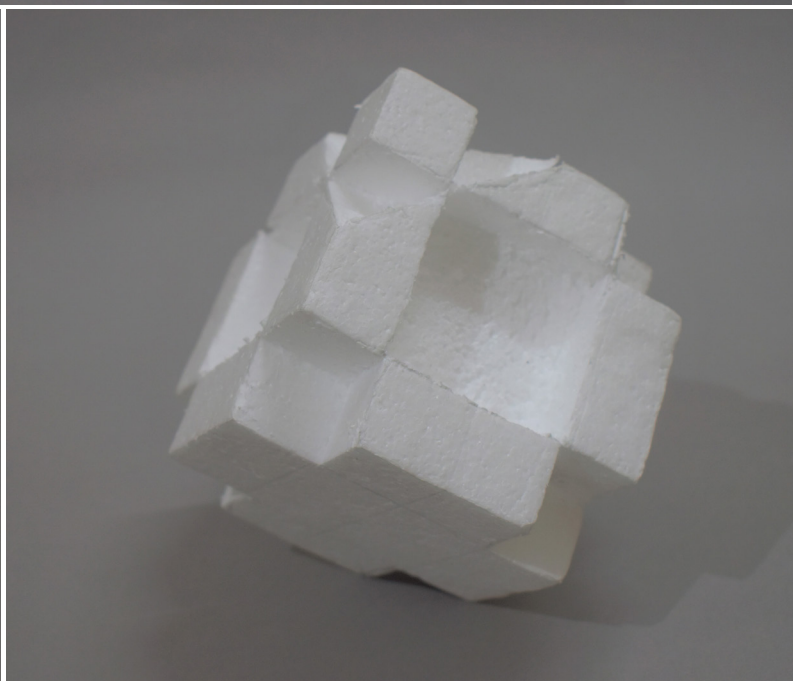
Form Exploration - 1



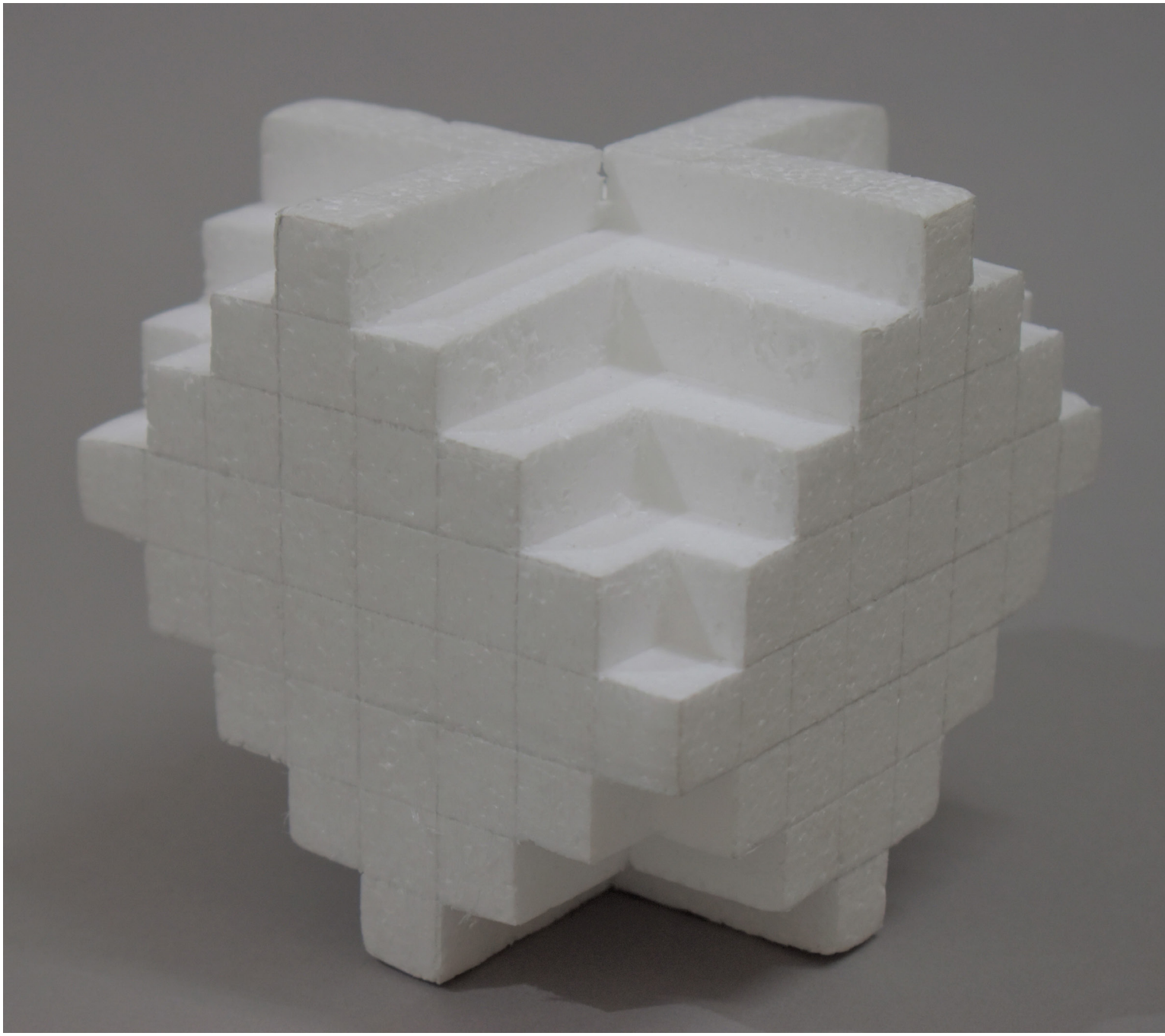
Form Exploration - 2



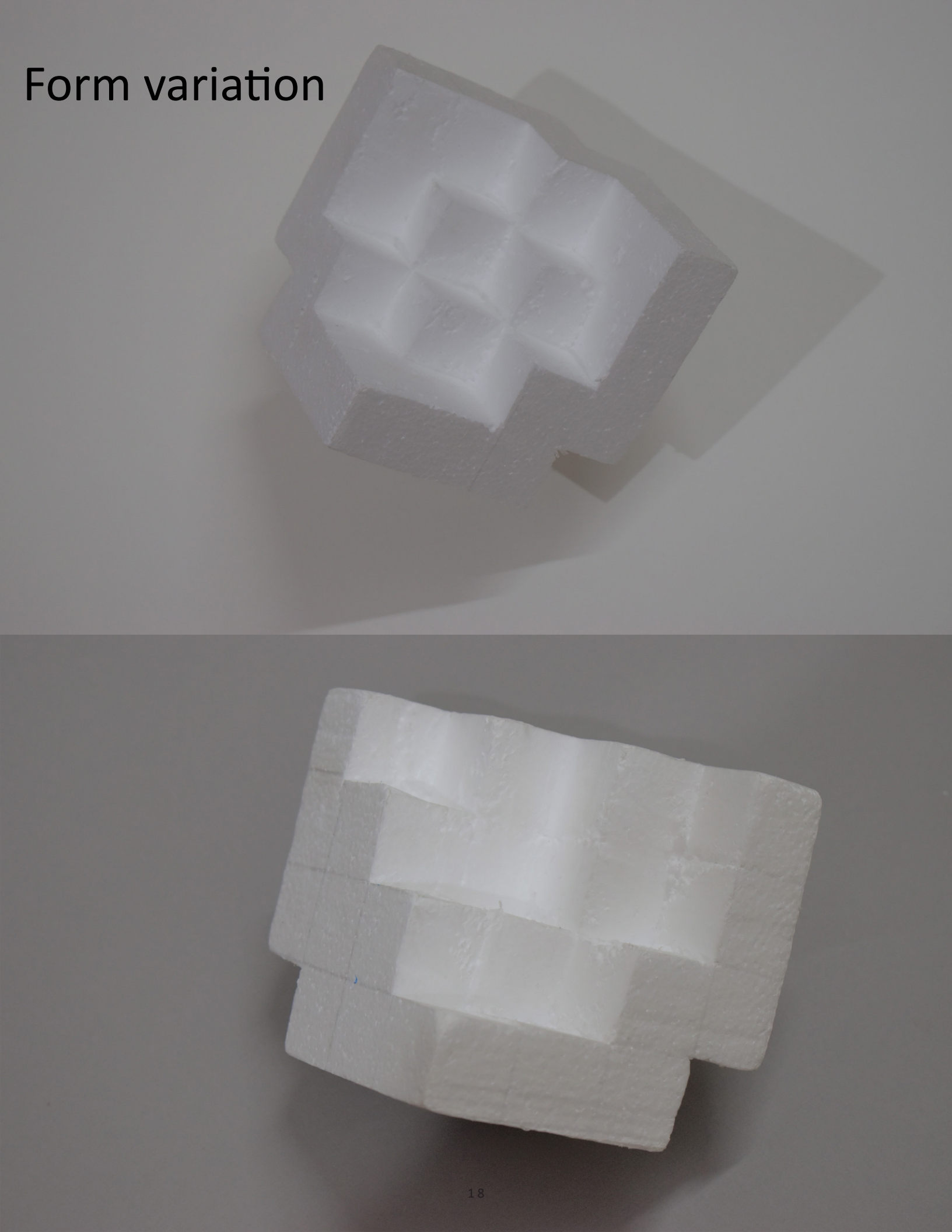


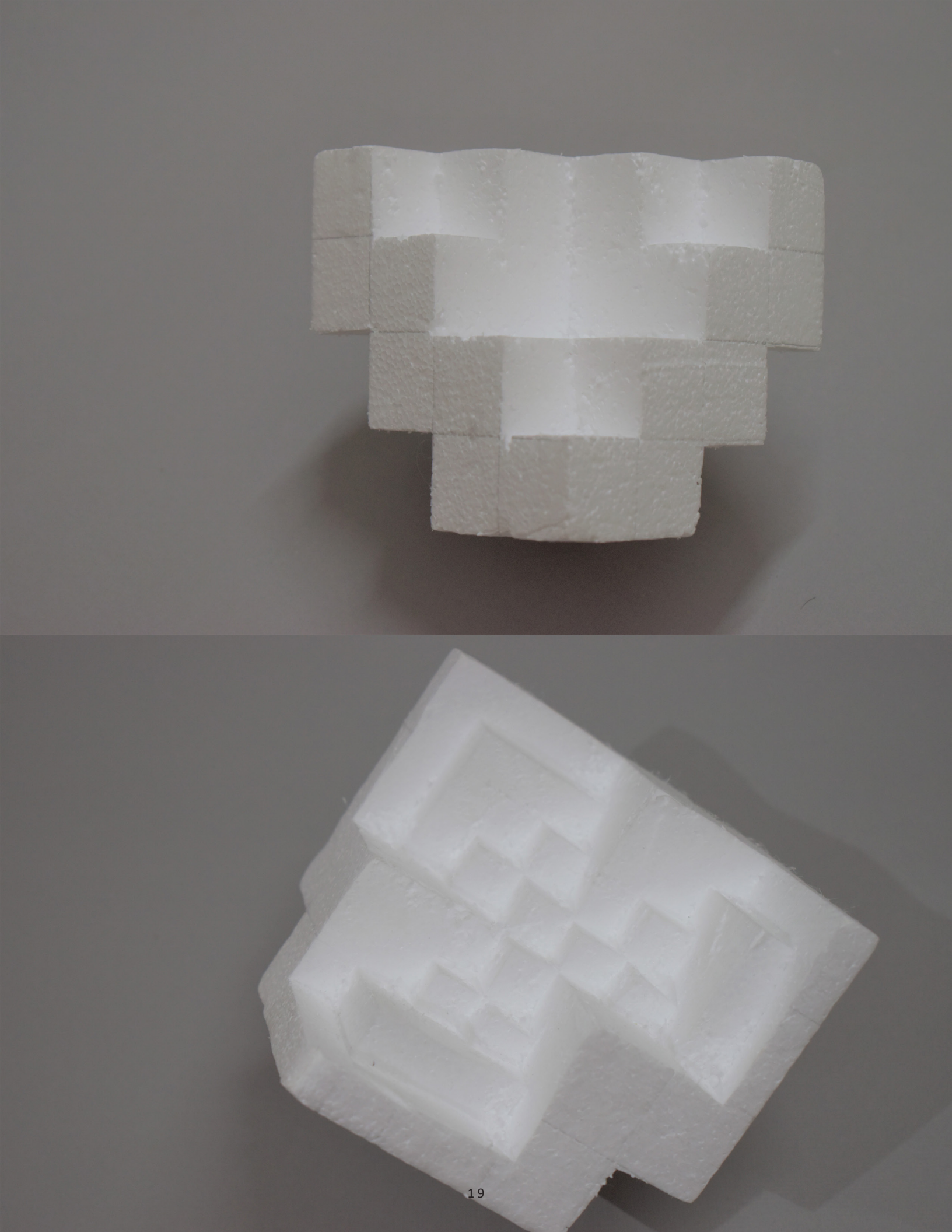


Form Exploration - 3

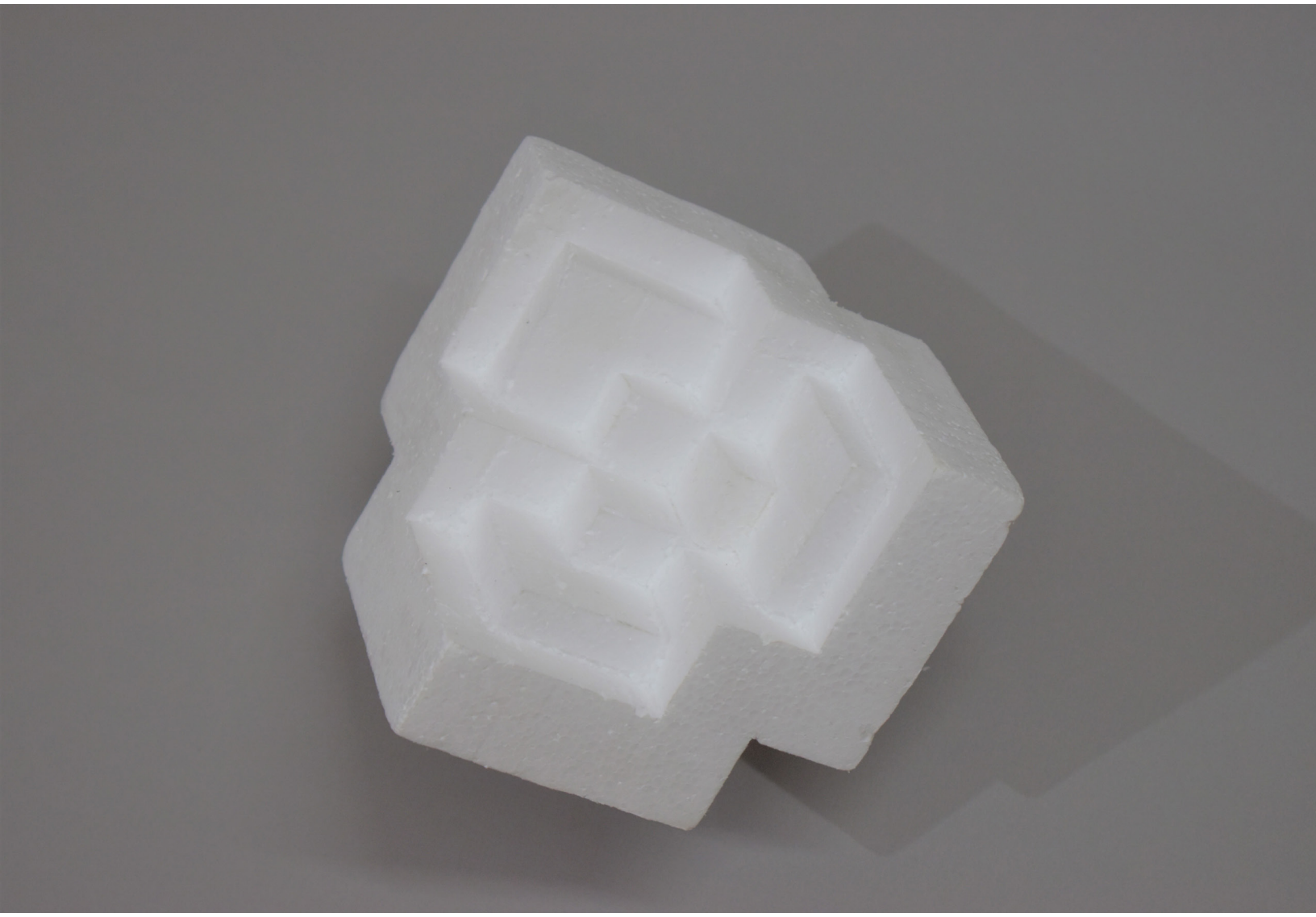


Form variation



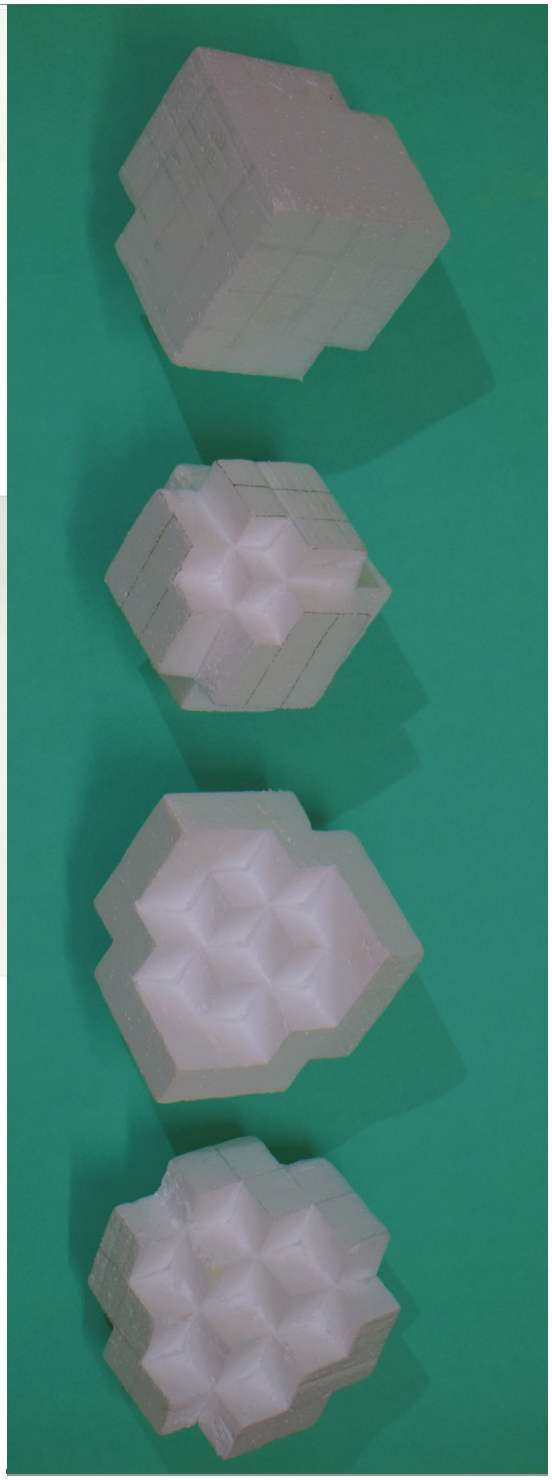


Final Form

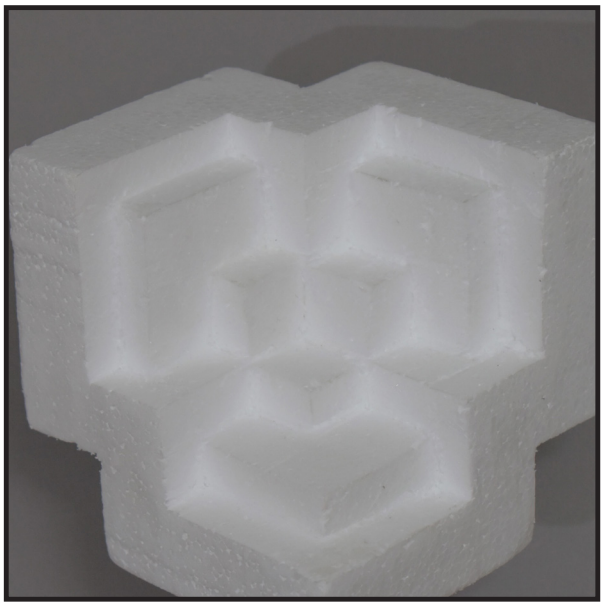


This form represents a blooming water lily. Balanced on 3 points it replicates the floating element of water lily. Three sepal protect the delicate petals inside them. Smaller cuboids represnts anther that lies in middle of the flower. It is designed with given constraints to derive it from a cube.

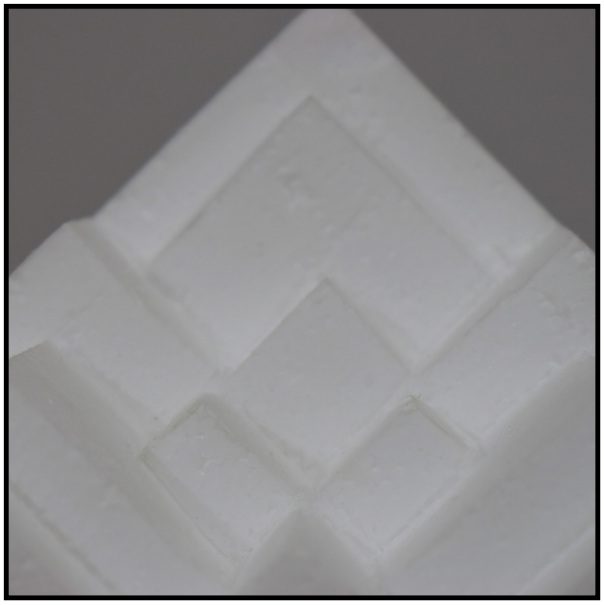
Blooming sequence of Waterlily.



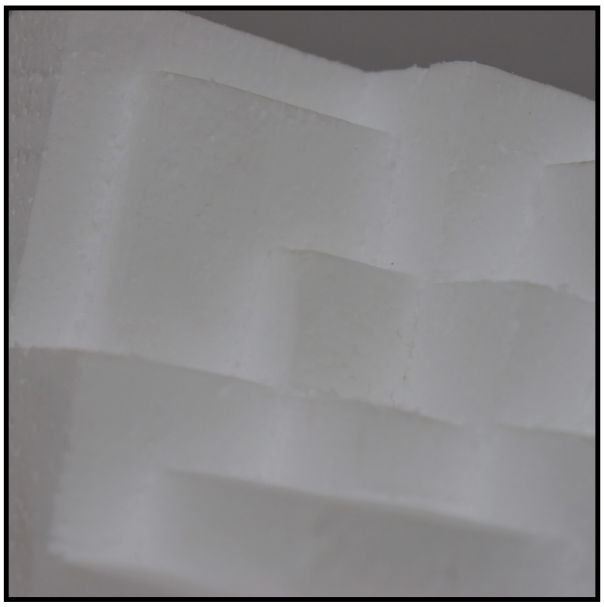
Reflection of elements of composi-ton



BALANCE



RHYTHM



HARMONY