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The Space of Mondrian
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The painter starts from the real world and when he or she finishes a work, it is an abstraction of the so-called real world. The architect on the other hand, starts from the abstract world and, because of the nature of his or her work, it gravitates towards the real world. The relevant architect is that one which, on having finished the work, is as close to the original abstraction as possible; and this is what distinguishes architects from builders.
- John Hejduk 1974

thinking beyond architecture

How does one introduce a beginning design student to spatial concepts and spatial ways of seeing? As Hejduk states the architect begins from the abstract - a world of ideas, of concepts, of aspirations - and gravitates toward built form. Students must first see and critically assess and question this abstract world before they can make the jump toward the real world. They arrive with so many misconceptions about architecture yet have no conceptions about the abstract world.

It is important that beginning design students, in this case sophomore students at Clemson University with no prior architectural background hoping to transfer into the architecture program, be exposed to principles of form, space, and tectonics. By analyzing a work executed on a two dimensional surface, a painting for example, and then re-interpreting and constructing this painting within a three-dimensional space, calls many of the student's preconceived spatial ideas into question. I was interested in how using painting as a ground for exploration would achieve some of these goals - specifically using this abstract analysis as a way to begin understanding spatial relationships. Requiring the student to begin questioning what his/her spatial ideas are about, I conceived of a series of exercises encouraging the student to make a series of responses - abstract ones at first followed by a series of architectonic responses - all of which are based upon fundamental spatial relationships. Through this studio sequence, the students begin by looking at several paintings of Piet Mondrian. Extracting geometric and spatial relationships, interpreting these relationships first two-dimensionally and then three dimensionally, using specific materials to further explore spatial and geometric relationships, and finally exploring these spatial ideas in a more architectonic way, were all part of a process to engage the students on levels of both seeing and making.

I selected the work of Mondrian for several reasons. The artist's language could be read as an abstraction of natural form and order. Typically working within a rigid set of parameters, Mondrian states "...by abstracting the natural course of things and not by copying architecture, [the work is] likewise expressing the cosmic equilibrium." Mondrian's work can be understood as the abstraction of the real world Hejduk referred to at the beginning of this paper - a world thought of in terms of ideas, images, and form.

pedagogy

After giving a lecture on Piet Mondrian's life and work, each student selected a painting from a list I compiled. All the paintings were highly structured, consisting of several colors, and containing some sort of grid element. Through the student's first series of drawing analyses, formal elements within the paintings were discovered resulting from discussions about scale, depth, form, color, and the weaving of spaces within the various layers. Upon further investigation, geometries and
underlying structures, which initially may not have been apparent, were discovered. There were several phases of the drawing analysis—phase one looked at the most obvious or strong elements within the painting; phase two looked at apparent or obvious geometries within the painting; and phase three speculated about possibly geometries or other relationships the students were able to discover.

Once the geometric analysis was completed, the students were asked to create three-dimensional chipboard models interpreting their two-dimensional drawing analysis. Taking various elements from their analysis, students produced a series of twelve-inch volume models. Moving beyond the initial spatial confines of the paintings, the students began to explore not only spatial issues presented by the painting but other relationships discovered through the making of these models. One of the interesting observations during the first series of models was the number of students who, through their interpretation of their painting, had constructed an implied ground plane in their models. The presence of this strong surface, in a sense, limited the possibilities of rotating their twelve-inch cube models to obtain other spatial configurations. Most assumed the model must rest on a horizontal plane. After some discussion about what their ground planes implied and what their preconceived ideas about the ground were, the horizontal ground plane was eliminated and the inter-spatial relationships of the model were made oftentimes, more visible. Allowing the model to be viewed from any side and thus eschewing a front/back/side orientation, the model became both a space-defining and space-creating object.

Once the twelve-inch chipboard cube series were completed, the students were asked to select a six-inch volume or site within their model to focus on during the next series of studies. This became thought of as a detail for the larger model and through several iterations, began to take on a life of its own—continuing to explore spatial relationships. They explored this six inch volume using a selected palette of materials: rockit, [a fast drying concrete], basswood, metal, and plexiglass. Casting the main spatial elements out of rockit, the students were confronted with making both the mold [negative forms] and the cast [positive forms] for their model. This process also necessitated an understanding of how different materials join together. Students quickly learned that you

![fig 2: excerpts from drawing analysis](image1)

![fig 3: first volumetric model](image2)

![fig 4: second volumetric model](image3)
could not use Elmers to glue plexiglass to concrete. Others discovered that they would have to cast a slot a certain depth and thickness in order to hold the plexiglass. How would the weight of the concrete affect the joint? How far could you cantilever the wood from the concrete? What did each material represent in terms of the painting? In part it was an intuitive process of exploration where immutable material logic dictated some of the decision making. Once the models were completed, students were required to draw all orthographic views of these newly constructed models. These drawings were interesting in that they referred to the initial two-dimensional analysis in a way that had been informed by this new set of models.

Once this process completed, each student was required to use these spatial constructions as generators of the plan or section for the next phase of the process — the design of a retreat for a cellist in India. Once initial site research for the new project was finished, each student created a narrative for his/her project incorporating the last component from the Mondrian studies. The narrative was used as a tool to guide them in their design process. Some students focused on the physicality of the cello, some on specifics about cello concertos, and others dealt with issues of the site.

**materiality**

The issue of materiality is important for these exercises. Each series of media and techniques allowed a different set of issues about making to be discussed. It allowed the student to begin to develop a language specific to not only spatial and abstract ideas but also material ideas. For example, using vellum and graphite, the students were introduced to line drawing and observing how marks on paper begin to reveal one's observations. Moving into the realm of model making with chipboard and x-actos, the students began to be cognizant of the role precision and craft have in expressing one's spatial ideas [cutting and assembling parts together versus making marks in drawing; casting giving the material logic more clear expression of their projects without falling into the realm of the realistic].
conclusions

As is the case in all studios, more time would have allowed more investigations. I would have liked the students to do close and accurate drawings of their cast objects—not just the basic orthographic drawings they did do. This would have made the connection between representation and built form even clearer—something architects regularly confront. By seeing the actual object and then executing critical graphic models, the two-dimensional and three-dimensional relationships would be further enforced. Also, more time spent with the casting and material exploration would have enhanced students’ understanding and visualization about the tactile qualities of materials.

However, I believe the exercises were successful for three main reasons. One, the students were introduced to critical ways of seeing; two, they were introduced to several different mediums for both drawing and model making; and three, they produced some really interesting work that could be discussed not only within the discourse of the beginning design student but also on a level far more sophisticated than the beginning student.

Bibliography

