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Theory of Architecture 01 - 2019

SPATIAL ORGANIZATION

There are five types of spatial organization:

1 . **Central Organization Organization**
2 . **Linear Organization**
3 . **Radial Organization**
4 . **Cluster Organization**
5 . **GRID Organization**

Central Organization

- It is a stable & concentrated composition
- It consists of numerous secondary spaces that are clustered around a central dominate and bigger space
- It presents secondary spaces that are equal in terms of role, shape & form, which creates a distribution package that's geometrically regular to two or more axes.
- Those central organizations whose forms are relatively compact and geometrically regular can be used to :
  - –Establish "places" in space,
  - – Be term of axial compositions,
  - –Finally acts as a frm - object inserted into a field or exactly define spatial volume .

Spring semester 2019

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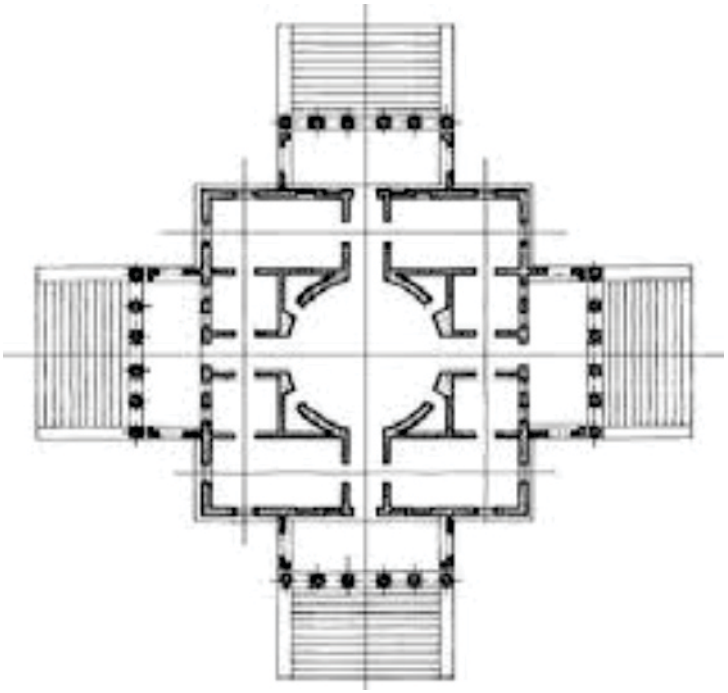

Villa capra, Italy , Andrea Palladio.

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Linear Organization

- Consists essentially of a series of spaces.
- These spaces can be interconnected directly, or be linked through another linear independent and distinct space.
- Those spaces that are important, functionally or symbolically within this organization, can take place anywhere in the linear sequence and show their relevance using their size and shape.
- The organization can solve linear different conditions at the site.
- It can be a straight, segmented or curve line and it can develop itself horizontally, vertically or diagonally.
- The linear organization can relate itself with other forms of its context connecting them, working as a barrier to separate things and surrounding them to create a space field.

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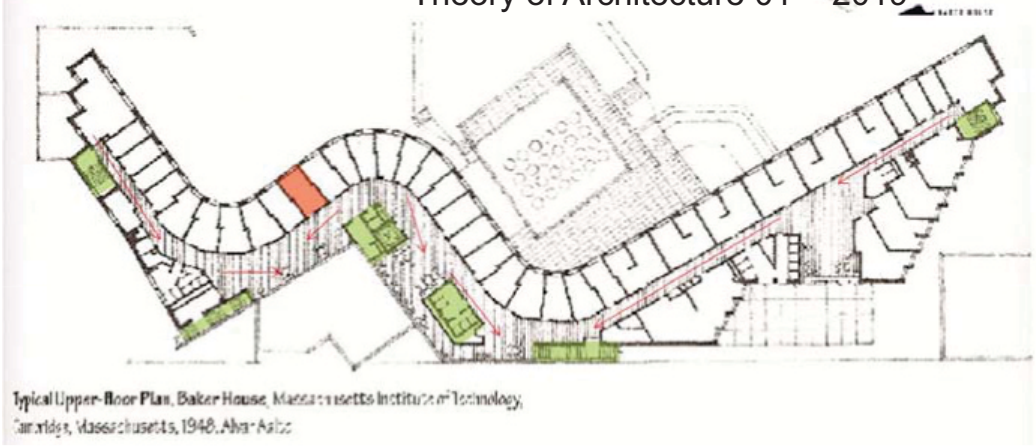

Typical Upper-floor Plan, Baker House, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1948. Alvar Aalto

Baker House , M.I.T , Massachusetts , Alvar Alto.

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Radial Organización

It combines elements ofb oth linear and centralized organizations. It consists of a dominant central space, with many radial linear organizations.

While a centralized organization is an introverted scheme that directs to the interior ofi ts central space, a radial organization is an extrovert scheme that escapes from its context.

The central space of a radial organization has a regular form, acts as the hub oft he linear arms and maintains the formal regularity oft he whole organization.

•Extroverted in nature .
•Relate to or attach themselves to specific features of a site.
•Exposed to sun , wind , view.

CLUSTER Organization

This type of spatial organization is used to connect spaces using proximity.

It can accommodate in its composition spaces with different sizes, shapes and functions, as long as they relate themselves by proximity and some visual element.

The connected spaces can be grouped gather around a large area or a well defined spatial volume.

•interlock their volume and merge into a single form having variety of faces.

•Contains spaces which have common properties – shape , size, texture

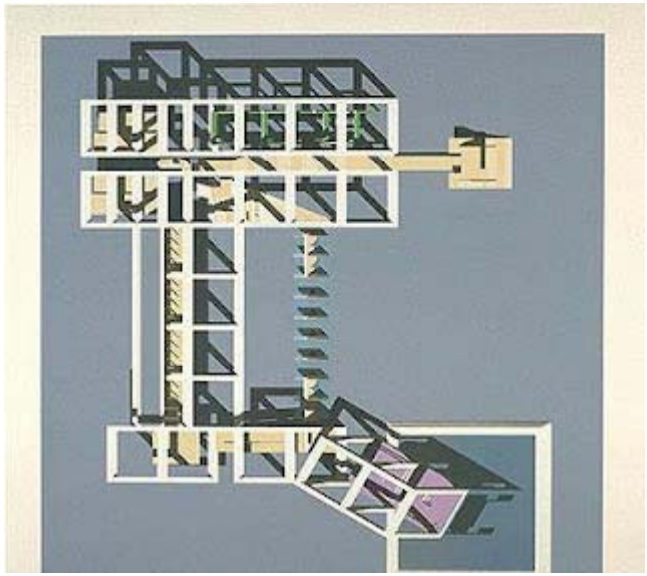
Habitat Israel , Jerusalem , Moshe Safdie

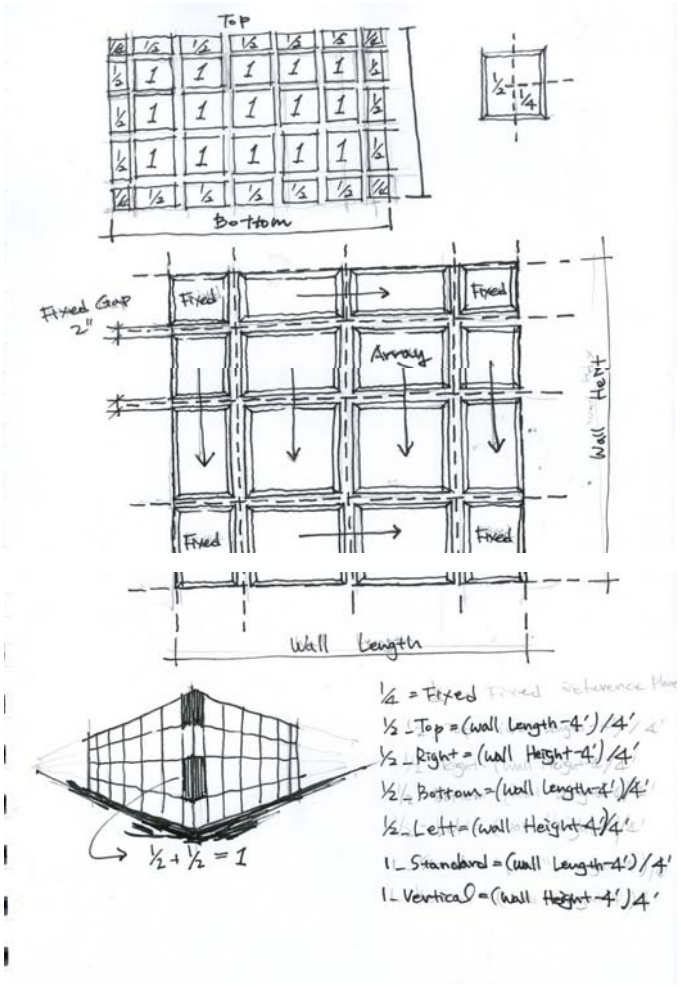
GRID ORGANIZATION

•It consists off orms and spaces whose position in space and their interrelationships are regulated by a type of plot or a three dimensional field.

• It can be created by establishing a regular scheme of points that define the intersections between two groups of parallel lines.

•Its capacity on organization is the result of its regularity and continuity thati ncludes the same elements that distributes.





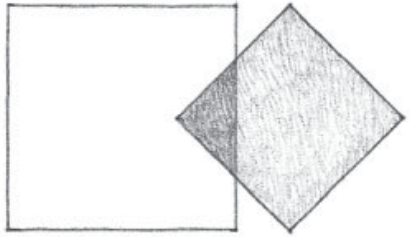
The Gunma Museum of Fine Arts is an Art Muesum designed by Arata Isozaki JAPAN.

Space within a Space

A space may be contained within the volume of a larger space

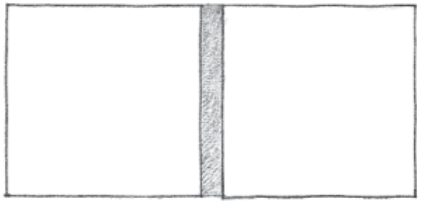
Interlocking Spaces

The field of a space may overlap the volume of another space



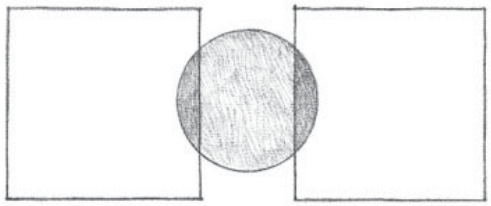
Adjacent Spaces

Two spaces may abut each other or share a common border.



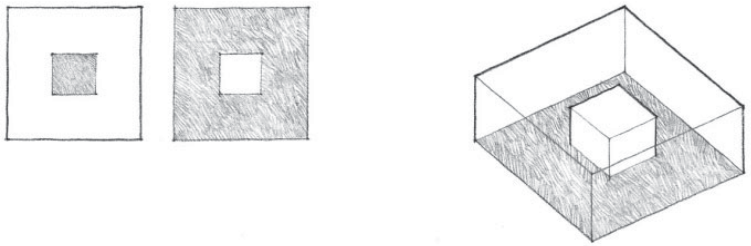
Spaces Linked by a Common Space

Two spaces may rely on an intermediary space for their relationship

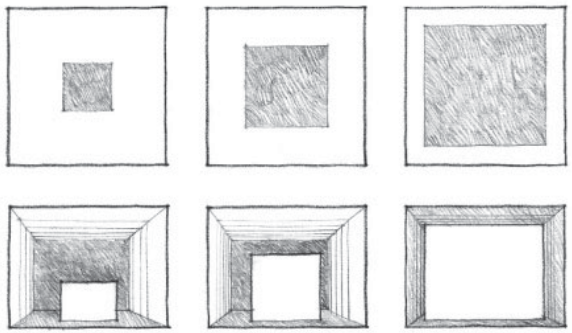


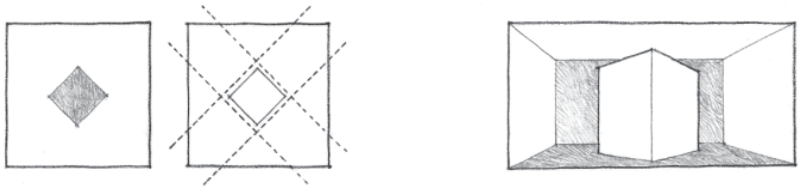
SPACE WITHIN A SPACE

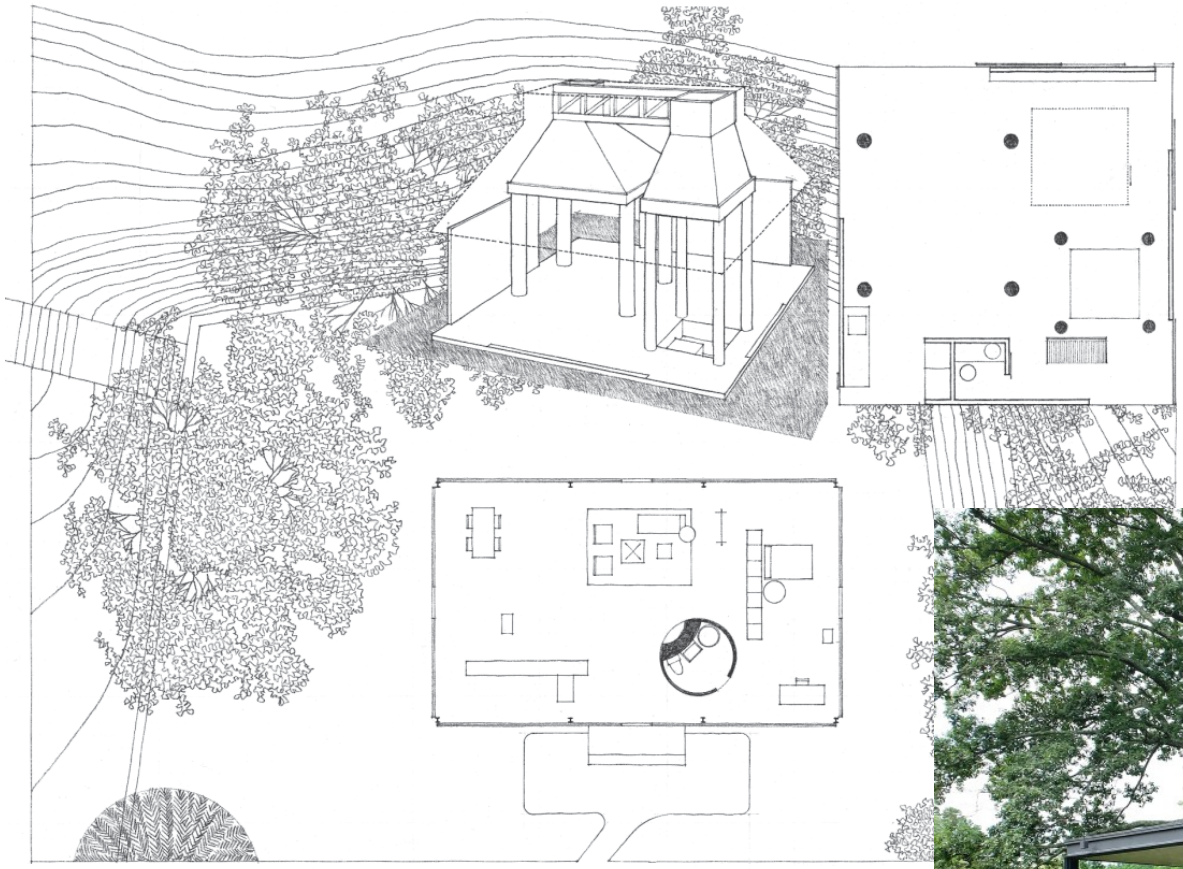
A large space can envelop and contain a smaller space within its volume. Visual and spatial continuity between the two spaces can be easily accommodated, but the smaller, contained space depends on the larger, enveloping space for its relationship to the exterior environment.



In this type of spatial relationship, the larger, enveloping space serves as a three-dimensional field for the smaller space contained within it. For this concept to be perceived, a clear differentiation in size is necessary between the two spaces. If the contained space were to increase in size, the larger space would begin to lose its impact as an enveloping form. If the contained space continued to grow, the residual space around it would become too compressed to serve as an enveloping space. It would become instead merely a thin layer or skin around the contained space. The original notion would be destroyed.
To endow itself with a higher attention-value, the contained space may share the form of the enveloping shape, but be oriented in a different manner. This would create a secondary grid and a set of dynamic, residual spaces within the larger space.



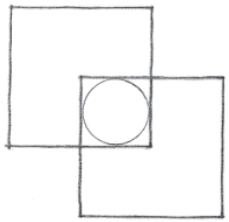


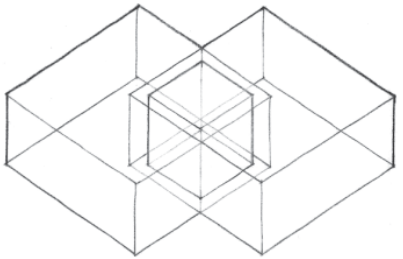


Glass House, New Canaan, Connecticut, 1949, Philip Johnson

INTERLOCKING SPACES

An interlocking spatial relationship results from the overlapping of two spatial fields and the emergence of a zone of shared space. When two spaces interlock their volumes in this manner, each retains its identity and definition as a space. But the resulting configuration of the two interlocking spaces is subject to a number of interpretations

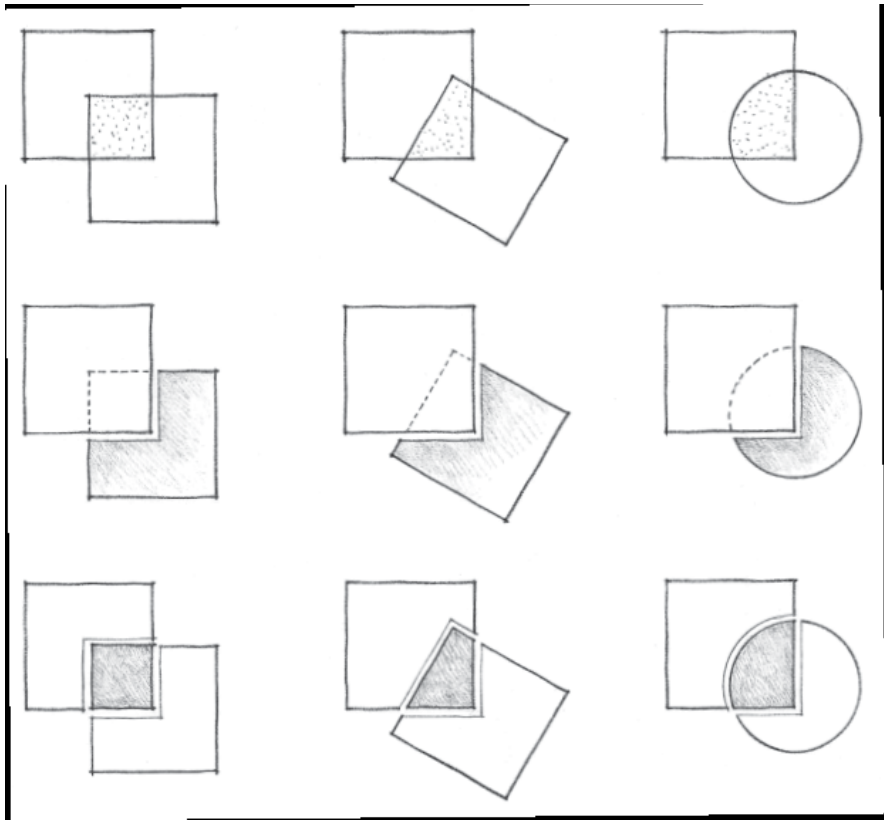




The interlocking portion of the two volumes can be shared equally by each space.

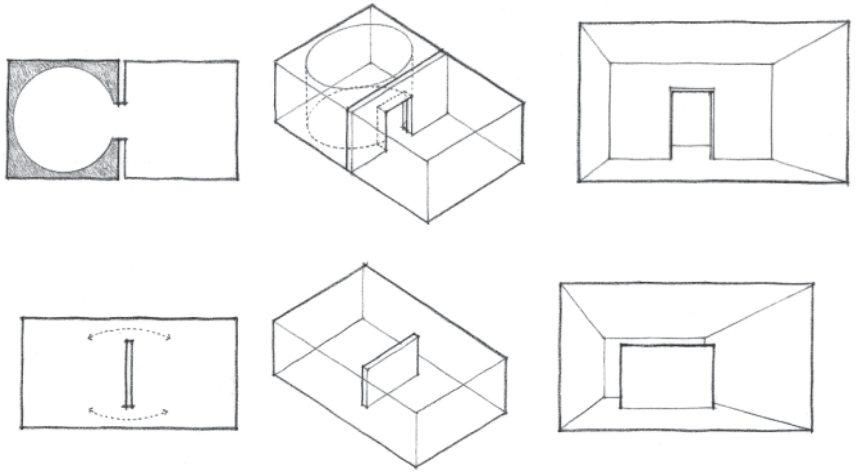
The interlocking portion can merge with one of the spaces and become an integral part of its volume.

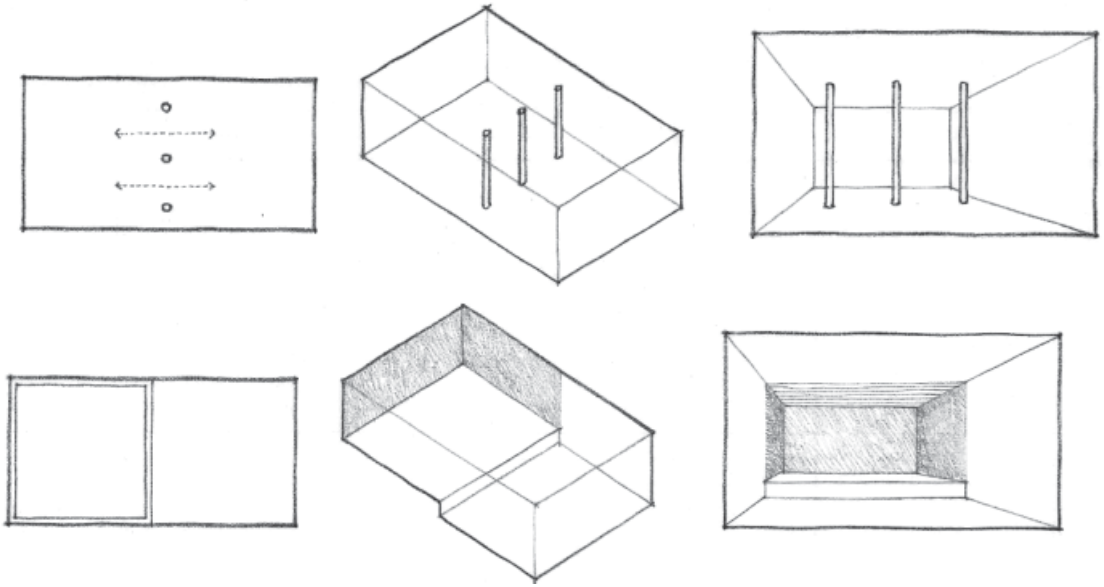
The interlocking portion can develop its own integrity as a space that serves to link the two original spaces



ADJACENT SPACES

Adjacency is the most common type of spatial relationship. It allows each space to be clearly defined and to respond, each in its own way, to specific functional or symbolic requirements. The degree of visual and spatial continuity that occurs between two adjacent spaces depends on the nature of the plane that both separates and binds them together.
The separating plane may:

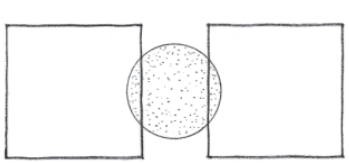


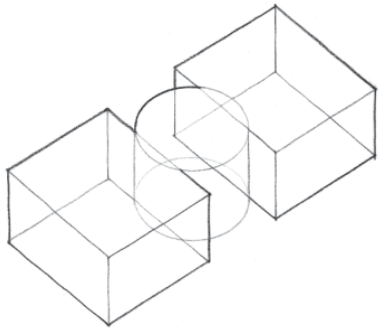


surface material or texture between the two spaces. This and the preceding two cases can also be read as single volumes of space which are divided into two related zones.

SPACES LINKED BY A COMMON SPACE

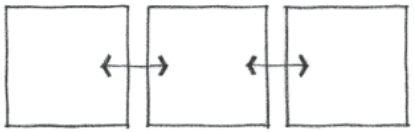
Two spaces that are separated by distance can be linked or related to each other by a third, intermediate, space. The visual and spatial relationship between the two spaces depends on the nature of the third space with which they share a common bond.



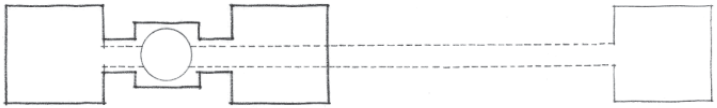


The intermediate space can differ in form and orientation from the two spaces to express its linking function.

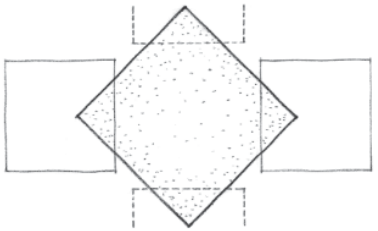
The two spaces, as well as the intermediate space, can be equivalent in size and shape and form a linear sequence of spaces.



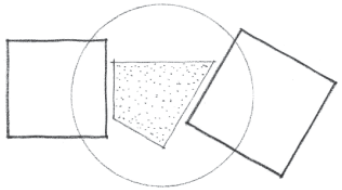
The intermediate space can itself become linear in form to link two spaces that are distant from each other, or join a whole series of spaces that have no direct relationship to one another.

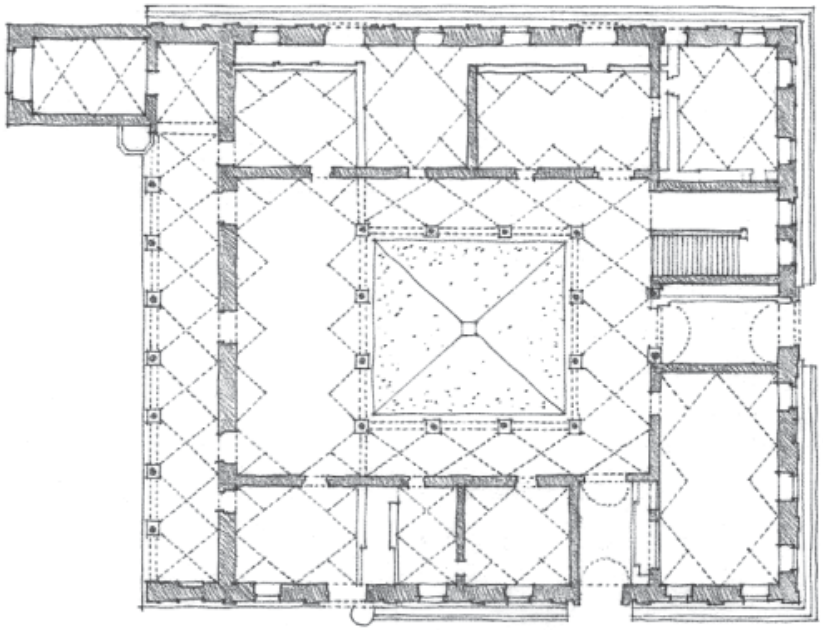


The intermediate space can, if large enough, become the dominant space in the relationship, and be capable of organizing a number of spaces about itself.

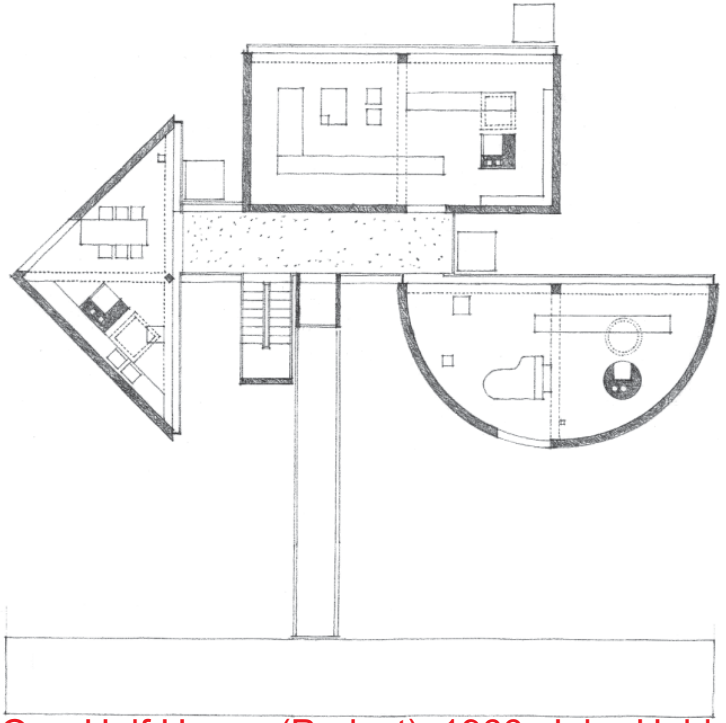


The form of the intermediate space can be residual in nature and be determined solely by the forms and orientations of the two spaces being linked

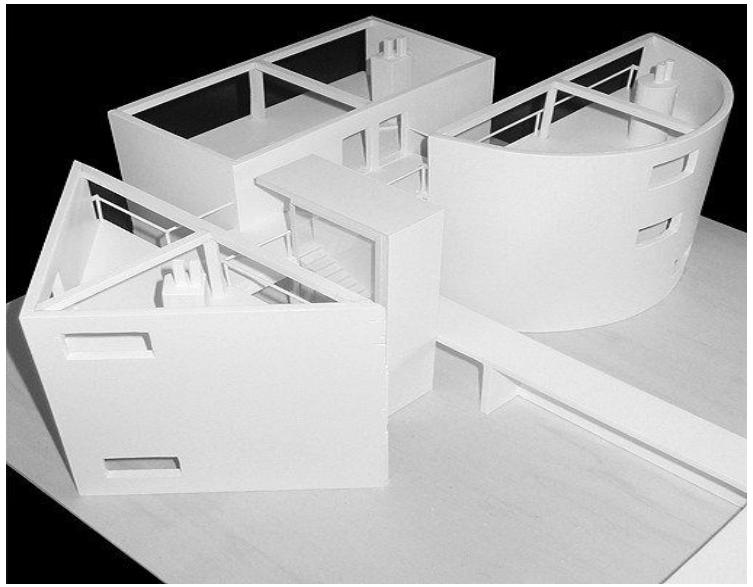




Palazzo Piccolomini, Pienza, Italy, c. 1460, Bernardo Rosselino



One-Half House (Project), 1966, John Hejduk



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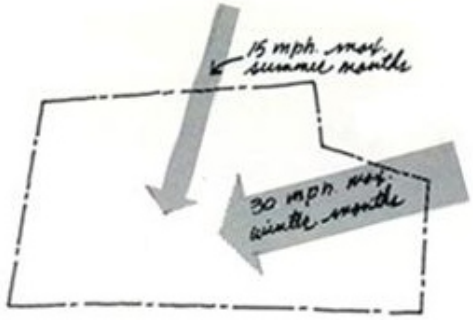
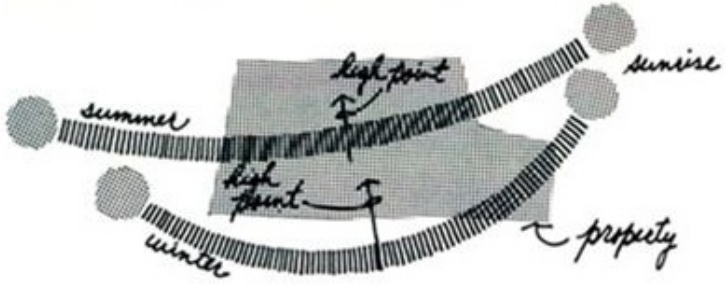
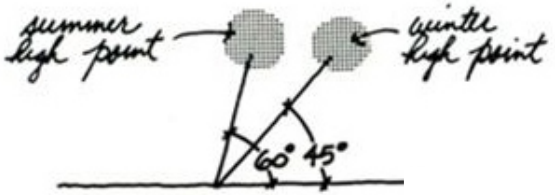
Microclimate: Sun and Wind Incidence

- Orientation of the building depends on the prevailing winds and the sun.
- Certain activities will be performed in spaces sheltered from the wind, while others need to be executed in spaces exposed to the sun.



- Wind can be of two kinds: stormy (brings rain and/or snow) or mild breezes. Buildings should turn their back to stormy winds and allow themselves to get cross ventilation from welcome breezes.
- The sun provides a source for natural light, natural heating, and plant life.
- Facing east, the building receives the cool morning sun (low incidence)
- Facing south, the building receives a warm midday sun, but not the hottest. It is low in winter and high in the summer. Southeast is the best orientation for life.
- Facing west, the building receives the hot sun of the late afternoon (low incidence). It is the worst orientation in the summer.
- Facing north, the building has the cold view of a sunless sky; being away from sunlight it receives an even light (ideal for working rooms).





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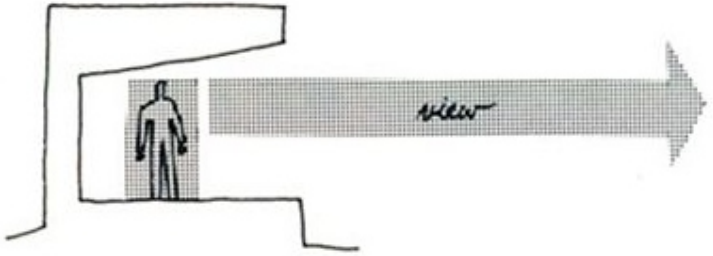
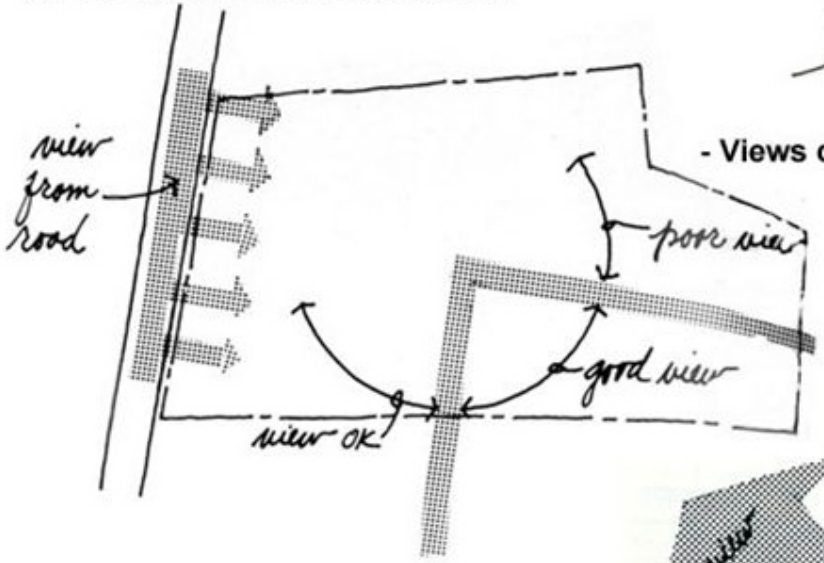
The View

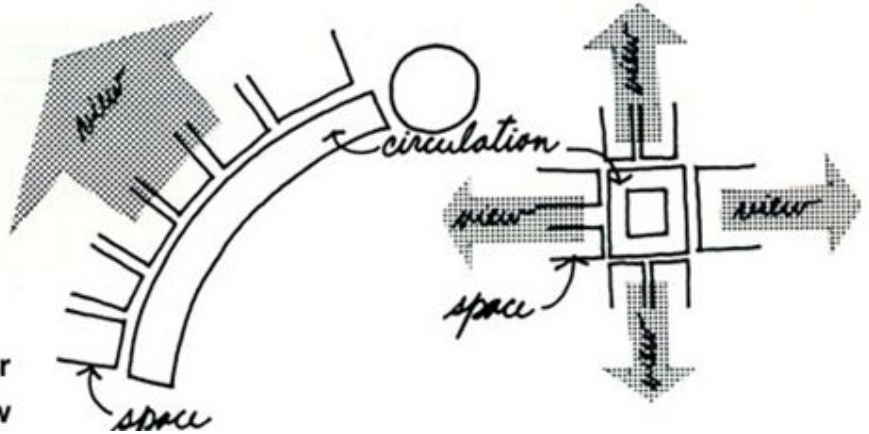
- The view entice people to rest, relax, and enjoy the visions of the outer environment.



- Views can be from and to the site



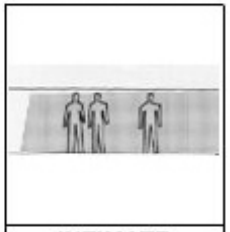
- Appropriate activities can be arranged for orientation to view



1.2.2. MORE ABOUT FORMAL / SPATIAL AESTHETICS: Balance Between Exterior Form /Interior Space

- Aesthetic goals can also make reference to the specific perception of interior spaces.
- Interior spaces can be classified in reference to their different formal characteristics:

Size related to human scale



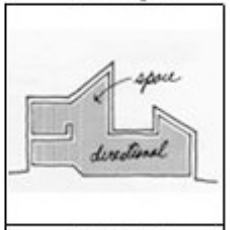
INTIMATE

NORMAL

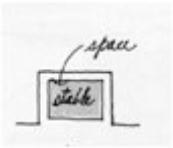
MONUMENTAL

IN SHOCK

Shape

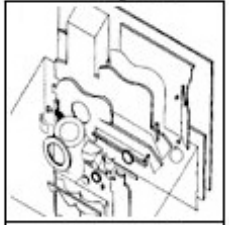


DYNAMIC

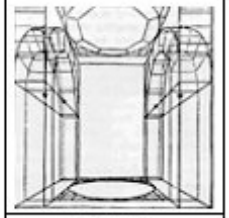


STATIC

Depth

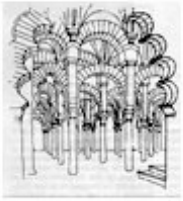


SHALLOW



DEEP

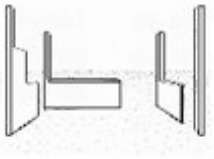
Density



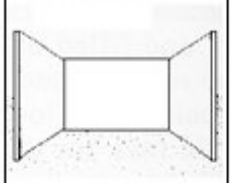
DENSE

EMPTY

Degree of Definition / Enclosure

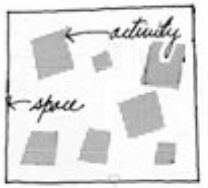


IMPLICIT

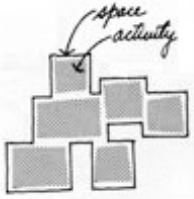


EXPLICIT

Relationship with other spaces / Configuration



OPEN

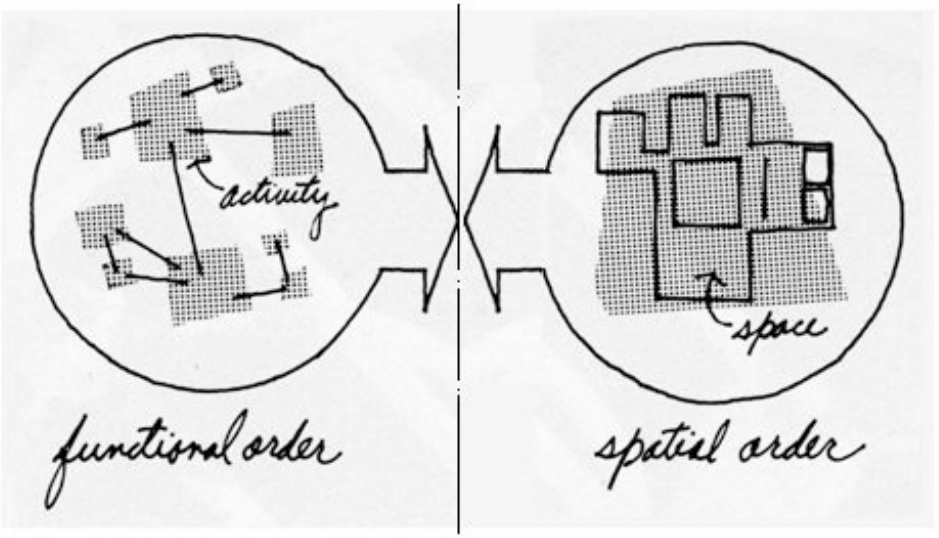


CLOSE

The different degrees (i.e. transition spaces) and combinations of formal characteristics define the expression of functional spaces.

3. About the Evaluation Phase in design

3.1. PERFORMANCE EVALUATION : FUNCTIONAL ASPECTS



ACTIVITIES →	ORDERED ACTIVITIES →	AREAS & SPACES
given by client, defined by architect according with the type of building to design	*application of ordering systems to the list of activities*	*assigning areas and spaces to ordered activities*
↓	↓	↓
LIST OF REQUIREMENTS AND CONSTRAINTS	**BUBBLE DIAGRAMS, MOVEMENT DIAGRAMS, ZONING GRAPHS**	**SPATIAL SIZE SPATIAL SHAPE SPATIAL ARRANGEMENT**
FUNCTIONAL ORDER ←		→ **SPATIAL ORDER**

3. About the Evaluation Phase in design

3.1. PERFORMANCE EVALUATION : FUNCTIONAL ASPECTS

CRITERIA FOR EVALUATION	SPATIAL ORDER		BASED ON:	
SPATIAL FIT	Space Size & Space Shape		Physical Space Requirements	- # of users - human physical dimensions - furniture + equipment - internal circulation - vehicles
			Psychological Requirements	EXPRESSION OF THE FORM
SPATIAL SEQUENCE	Spatial Arrangement		Functional Ordering Criteria	Activities possess many qualities which can be used in ordering them into their relationships
			Circulation Requirements	aaproach, entrance, paths, path/activities relationships
			Psychological Requirements	EXPRESSION OF THE FORM

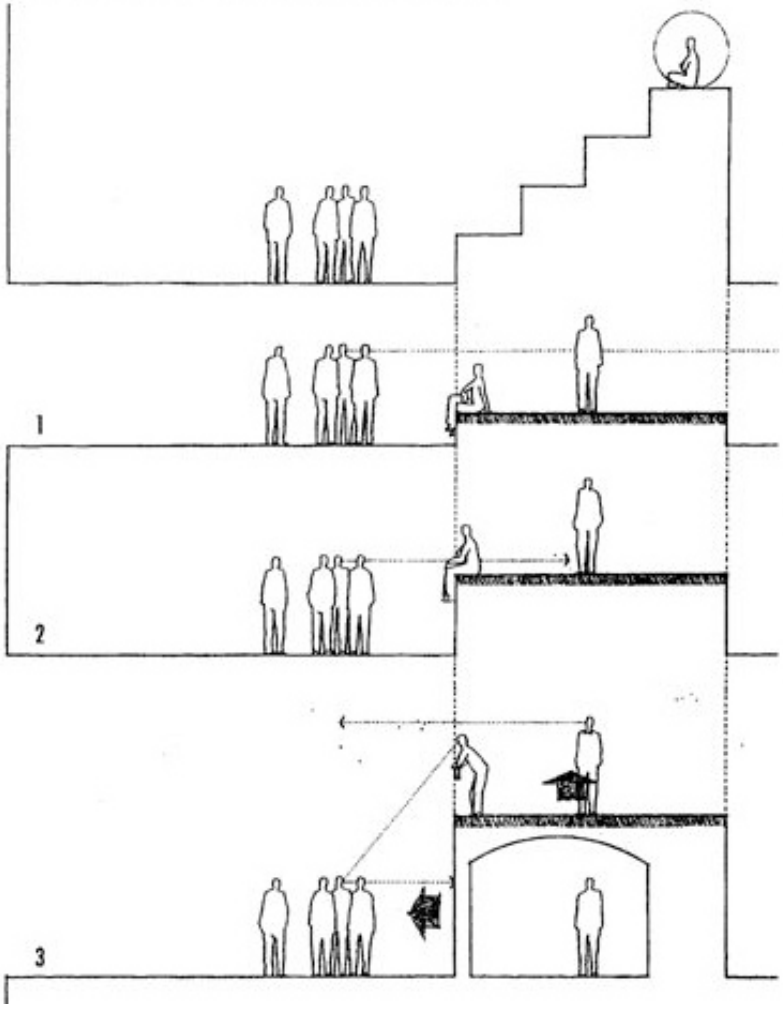
3.2.2. MORE ABOUT THE QUALITY OF INTERNAL SPACES

SPATIAL QUALITIES				EXPRESSION OF SPACE
FORM:	Size:	intimate		cozy
		normal		fitting
		monumental		imposing
		in-shock		difficult to bear
	Shape:	dynamic		flowing, interconnected, directional
		static		confined, segregated, stable
DEPTH:		shallow		compressed, ambiguous, small
		deep		uncompressed, evident, big
DENSITY:		dense		reassuring
		empty		tension between observer and limits of space, unitary

3.2.2.4. THE DEGREE OF ENCLOSURE

SPATIAL DEFINITION THROUGH:

ELEVATED BASE PLANES



FORMAL QUALITIES:

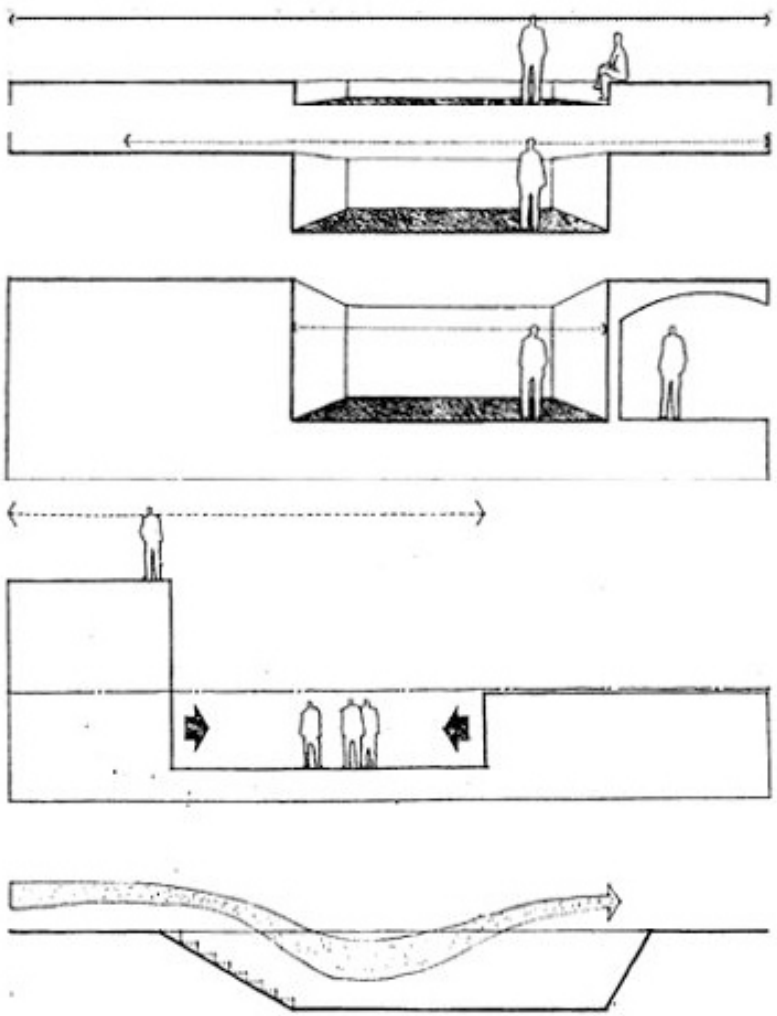
The degree to which spatial and visual continuity is maintained between an elevated space and its surroundings depends on the scale of the level change.

1. **The edge of the plane is well defined; visual and spatial continuity is maintained. Physical access is easily accomodated.**

2. **Visual continuity is maintained; spatial continuity is interrupted. Physical access requires the use of stairs and ramps.**

3. **Visual and spatial continuity is interrupted. The elevated plane becomes a sheltering element for the space below.**

SPATIAL DEFINITION THROUGH:
DEPRESSED BASE PLANES



FORMAL QUALITIES:

The degree of spatial continuity between a depressed plane and the raised area surrounding it depends on the scale of the level change.

1. The depressed plane can be an interruption of the floor and remain an integral part of the surrounding space.

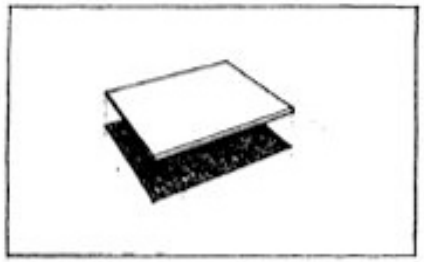
2. Increasing the depth of the depressed plane weakens its visual relationship with the surrounding space and strengthens its definition as a distinct volume of space.

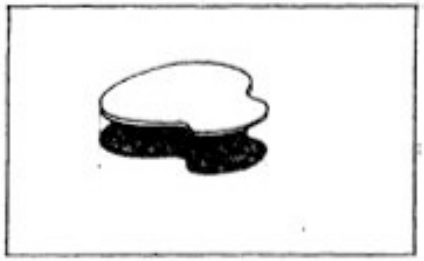
3. Once the original floor level is above the eye level, the depressed plane becomes a separate space in itself.

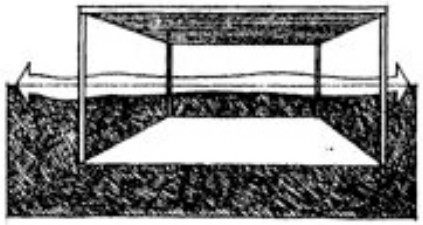
4. The act of stepping up to an elevated space express the extroverted nature or significance of the space. The lowering of a space below its surroundings might allude to its introverted nature or its sheltering qualities.

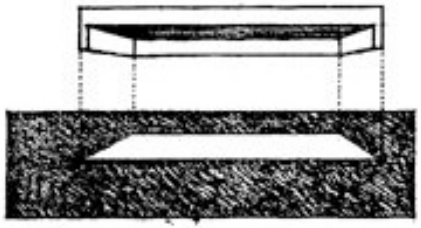
5. Creating a stepped, terraced or ramped transition from one level to the next helps promote continuitu between the sunken space and the area that raises around it.

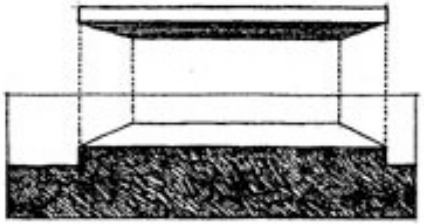
SPATIAL DEFINITION THROUGH:
OVERHEAD PLANES

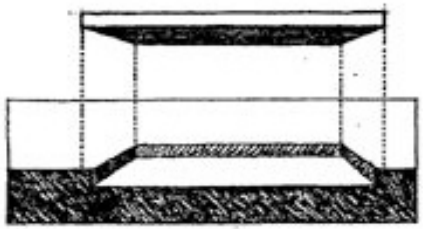




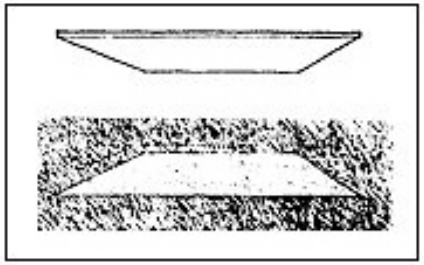


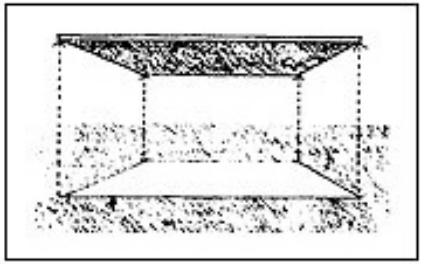






FORMAL QUALITIES:





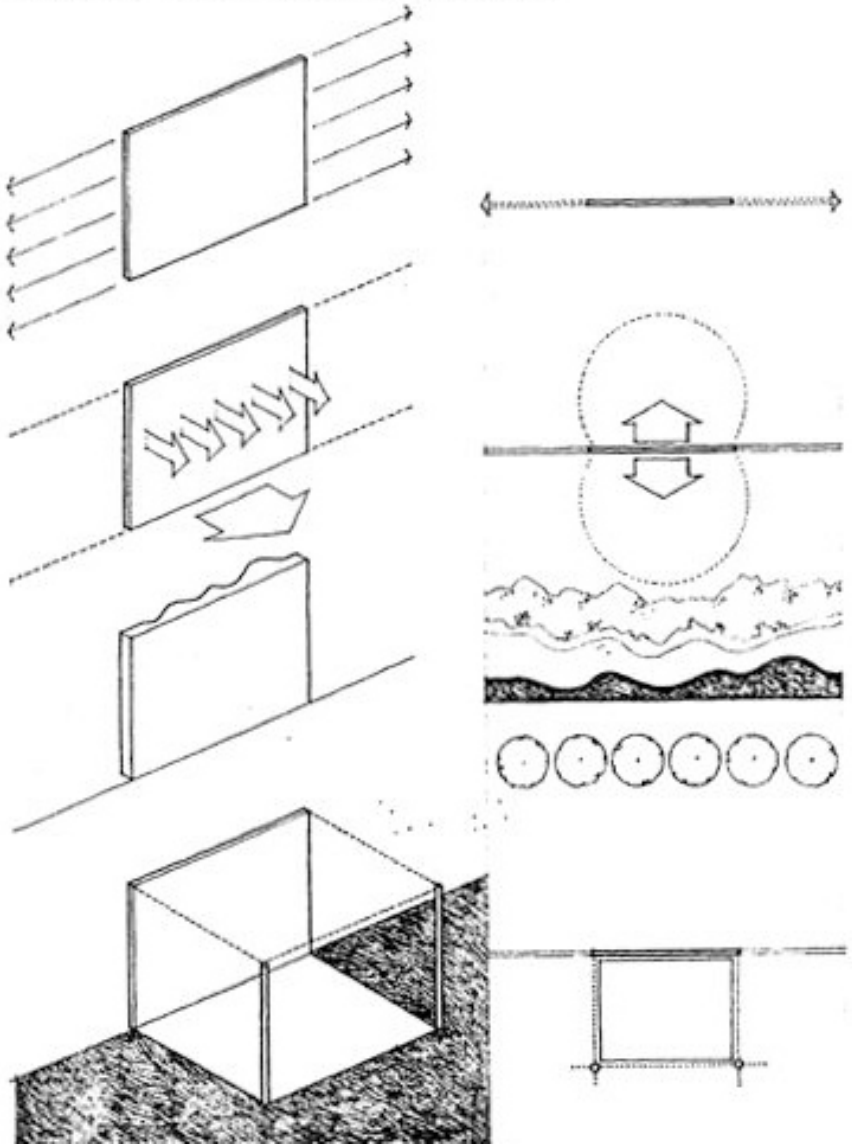
The edges of the overhead plane establish the boundaries of a field of space between itself and the ground plane.

1. The shape, size and height above the ground plane determines the formal qualities of the space.

2. Vertical elements (i.e. columnas) that support the overhead plane aid in visually establishing the limits of the define space.

3. Similarly if the edges of the overhand plane are turned downward, or if the base plane beneath changes in level, the boundaries of the defined volume of space will be visually reinforced.

SPATIAL DEFINITION THROUGH:
SINGLE VERTICAL PLANE

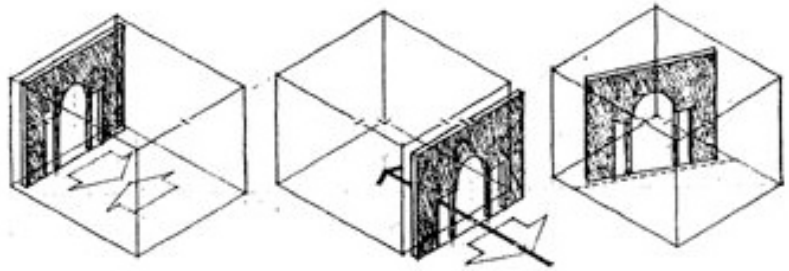


FORMAL QUALITIES:

1. A single vertical plane has directionality accross its axis. It has frontal qualities. Its two faces establish the edges of two separate spatial fields.

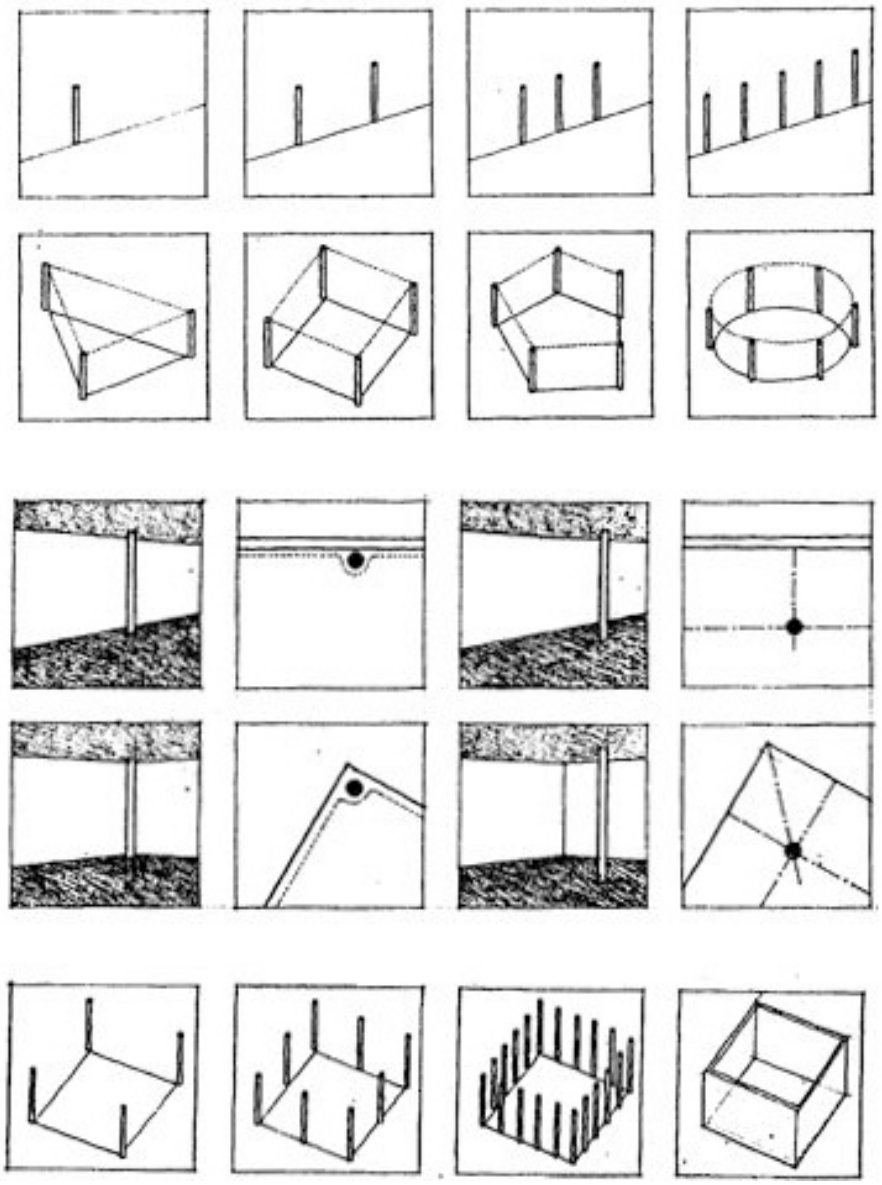
2. These two faces of a plane can be equivalent and front similar similar, or they can be differentiated.

3. To define a 3-dimensional volume of space, the single vertical plane must interact with other elements of form.



4. When related to a defined volume of space, a vertical plane can be:
   - the primary face of the space and give it a specific orientation
   - the front of the space and define a plane of entry into it.
   - a free standing element within a space and divide the volume into two separated but related areas.

SPATIAL DEFINITION THROUGH:
VERTICAL LINEAR ELEMENTS



FORMAL QUALITIES:

Vertical linear elements serve to define a volume of space by marking the limits of space (edges and corners).

1. Two columns establish a transparent spatial membrane by the visual tension between their shafts. Three or more columns can be arranged to define the corners of a volume of space.

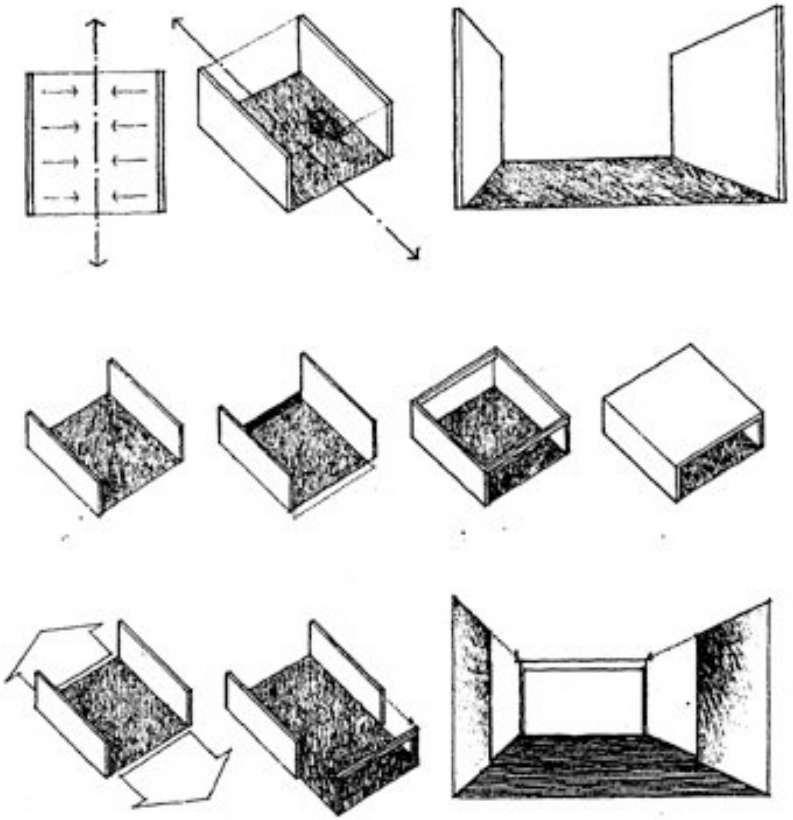
When located within a defined volume of space, a vertical linear element will generate a spatial field about itself and interact with the spatial closure.

2. A column attached to a wall butresses the plane and articulates its surface. At a corner, it punctuates the meeting of two wall planes. Standing free within a space, it defines zones of space within the enclosure.

3. The edges of the volume of space can be visually reinforced by articulating a base plane, upper limit with beams spanning between the columns, or an overhead plane.

4. A repetitive series of column elements along its perimeter would further strengthen the definition of the volume.

SPATIAL DEFINITION THROUGH:
PARALLEL VERTICAL PLANES

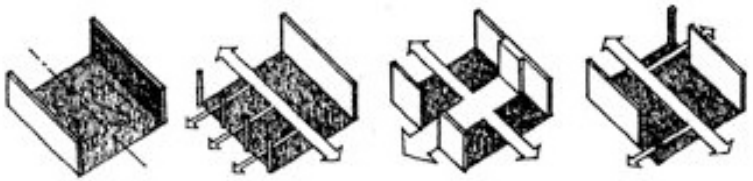


FORMAL QUALITIES:

1. A pair of parallel planes define a field of space with the following characteristics:
   - space with a strong sense of directionality along one axis.
   - the space is extroverted in nature (no corners to enclose the field)

2. By adding horizontal elements the field of space may be reinforced.

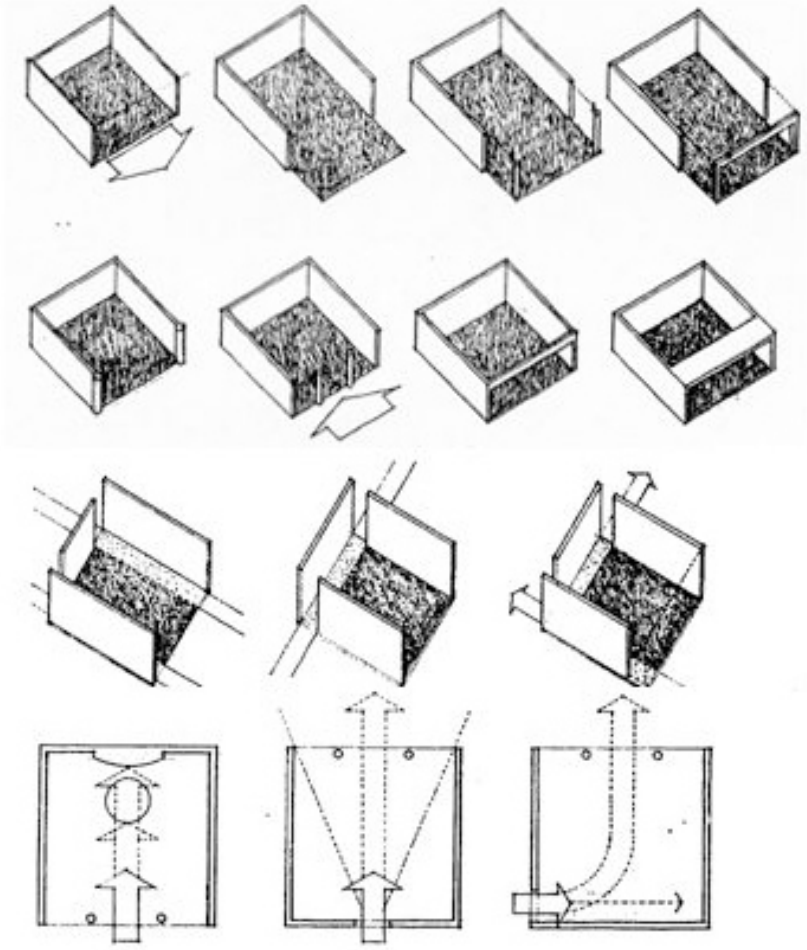
3. If one of the parallel planes is differentiated by a change in form, color or texture, a secondary axis (perpendicular) will be established within the field.



4. Openings can also introduce secondary axes and diversified the directional quality of the space.

SPATIAL DEFINITION THROUGH:

U-SHAPED PLANES

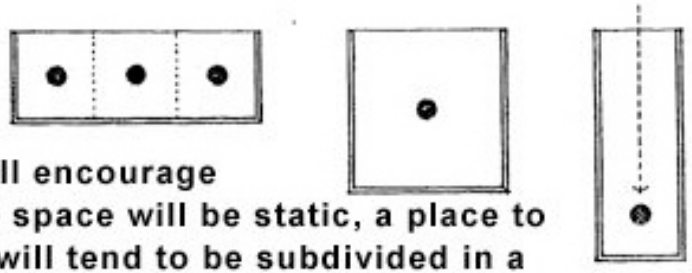


FORMAL QUALITIES:

1. A U-shaped configuration of vertical planes define a field of space which is well define at the close end of the space (introverted), while becoming extroverted in nature towards the open end. Because of its open end quality, the field of space have visual and spatial continuity with the adjoining space. Adding a base plane reinforce the continuity.

2. Adding definition to the plane of the opening interrupts continuity, but reinforces the field of space within.

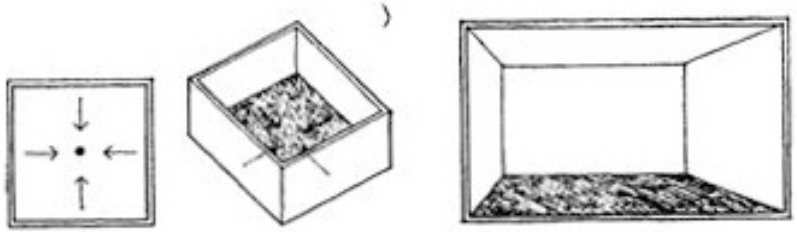
3. If openings are introduced at the corners, secondary zones will be created within a multi-directional and dynamic field. If the field of space is entered through the open end, the rear plane terminate our view of space. If entered through an opening in one of the planes, the view beyond the open will terminate the sequence.

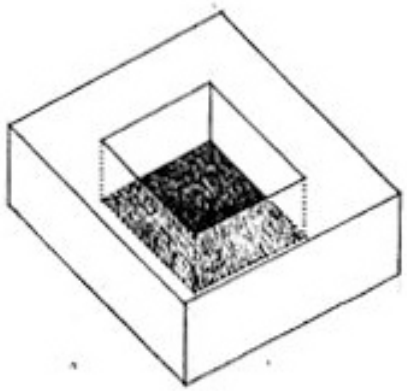


4. If the end of a long and narrow field is open, the space will encourage movement or sequence of events. If the field is square the space will be static, a place to be in. If the side of a long narrow field is open, the space will tend to be subdivided in a number of zones.

SOURCE: FRANCIS CHING

SPATIAL DEFINITION THROUGH:
FOUR PLANES





FORMAL QUALITIES:

Four vertical planes create the most typical and the strongest type of space.

1. Since it is completely enclosed its space is introverted in nature.

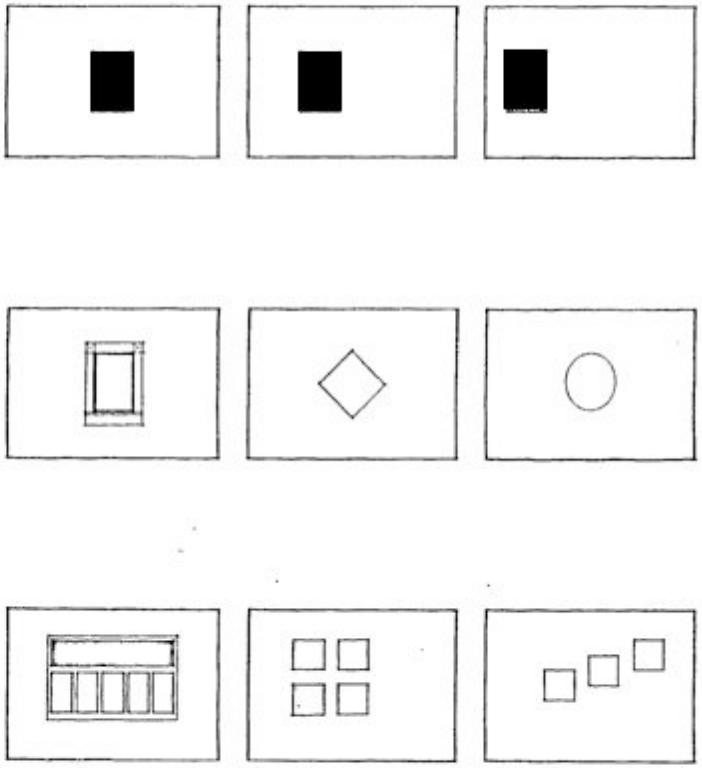
2. To achieve visual dominance within this space, one of the enclosing planes can be differentiated by its size, form, surface articulation, nature of its openings, etc.

3. Position, orientation, size and number of openings change our perception about the degree of enclosure of interior spaces.

3.2.2.4. MORE ABOUT THE DEGREE OF ENCLOSURE OF INTERIOR SPACES

OPENINGS IN SPACE DEFINING ELEMENTS: WITHIN PLANES

FORMAL QUALITIES



An opening located within a wall or ceiling plane appears like a figure against the background. Openings lying wholly in the enclosing planes of a space do not weaken the edge definition or the sense of closure. The form of space remains intact and perceptible.

1. **If centered, the opening will appear stable and visually organize the surface around it. Off center, it will create a degree of visual tension with the edges of the plane toward which it is moved.**

2. **If the shape of the opening is similar to the shape of the plane, it will create a redundant compositional pattern. A different shape emphasizes its individuality as a figure.**

3. **Multiple openings may be clustered: create a stable, unified composition; or dispersed: generate visual movement.**

SOURCE: FRANCIS CHING