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INSTITUTE OF ARCHITECTURE
URBAN PLANING AND CITY
DEVELOPMENT

BASIC DESIGN I

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Chapter one
Basic theory of forms and shape

Conceptual Definitions
- a. Form
- b. Shape

Conceptual Definitions

Form: Visible aspect of an object or figure. It could refer to parts or the whole of a figure that is describable in two or three dimensions. Form is also understood as being a characteristic feature of the conceptual element that we call a solid or a volume.

Shape: Is defined as the effect produced by the outlines or the edges of a figure. It is the visual field that the object occupies demarcated by the outer limits that distinguish it from its surroundings.

Introduction

This section defines one of the primary focuses of the course, the element of form. Architecture is an activity that utilizes form to define and enclose spaces that have specific functions. It is important to be able to understand form to the level where we can comfortably start to use it to model our abstract ideas and notions.

It is further important to note that the ultimate target of a design work is to create a solution that will be visible in the three dimensional visual world. Hence, we can say that our primary target in the process of visual design is to create a form, a model of generated through the process of abstraction.

Form as an element of design is more than a shape that is seen; it is a shape with definite size, color and texture. It is the equivalent of the summation of the components that we call visual element.

Since it is the summation of the visual elements that we call a form, our study must start with establishing:

- *a. A language that has elements that will help us construct forms*
- *b. A general principle defining possible operations on forms*
- *c. Principles of purposeful organization of forms*
- *d. Principles and tendencies of grouping of forms*
- *e. Principles of establishing relationships and order between forms*

Our concentration at this junction will be on defining and understanding what form as a design element is all about. we will start our study of forms by describing its evolution starting from the conceptual elements defined.

Form and the Conceptual Elements

If the conceptual elements are those that are not visible, a visual representation of them gives us a form. Though they are commonly referred to as point, line … they are in reality forms that have distinct visible characteristics that can be described and manipulated.

Form is the element that is visible and has describable properties that make up the list of visual elements. We study conceptual elements as forms and will exercise on their uses in the development of abstract ideas that can be used in the design process.

Form and the Conceptual Elements

a. Form as a Point : **Vocabulary - Physical Characteristics - Expressive Characteristics - Spatial Characteristics – Representational Characteristics – Point and the other Forms**

b. Form as a Line: **Vocabulary –Physical Characteristics - Types - Expressive Characteristics - Spatial Characteristics – Representational Characteristics – Line and the other Forms**

c. Form as a Plane: **Vocabulary - Physical Characteristics - Types - Expressive Characteristics - Spatial Characteristics – Representational Characteristics – Plane and the other Forms**

d. Form as a Volume: **Vocabulary – Physical Characteristics - Types - Expressive Characteristics - Spatial Characteristics – Representational Characteristics – Volume and the other Forms**

(a) Form as a Point

(i) Vocabulary: A point is an element that marks a position in the visual space.

(ii) Physical Characteristics: to serve as a point, a form must be small enough to be perceived as having no length, width or depth. It is only then that it will fulfill the conceptual requirement of an element that we defined as having no dimension. In addition, a point is considered to be an element that is static, centralized and direction less.

(iii) Expressive Characteristics: a point as a form expresses stability, calmness as it is static and centralization

(iv) Spatial Characteristics: A point as a form will be perceived by the observer inducing the spatial effect of stability when it is either alone or at the center of its field. When it is off-centered, it will create a sense of pulling or an effect that is termed as visual tension in design.

(v) Representational Characteristics: Representational characteristics are the direct results of the physical manipulation of the other characteristics of the element. As a form, a point has physical characteristics that can be used to represent ideas at a practical or abstract level. It can represent conceptual ideas such as positions, stability, calmness, etc.

(vi)Point and the other Forms: A point can have different uses based on what it marks when used as a form. The following examples are used to show some of the common uses of a point with regard to other elements of form:

1) A single point: Can be used to mark two ends of a line hence describing a conceptual element Intersection of two lines, defining a position

Meeting of lines at a corner of a plane or volume, helping to establish the contour that define the shape or volume Center of a field

2) Two points: Can be used to define a Line connecting them
Axis perpendicular to the line they describe

(b) Form as a Line

At a conceptual level, we have said that a point extended becomes a line: or a point in motion creates the appearance of a line. As an extension of a point, a line inherits the properties of a point and exhibits new characteristics.

(i) Physical Characteristics

As it is generated from an element that is understood to be dimensionless, it is visually recognizable because it is possible to perceive the relationship between its length and width. The width of a line so narrow that it is neglected hence, making line only measurable in its prominent direction, that corresponds to the motion of the point that has conceptually created it.

As a form, it conveys a feeling of thinness. In its conception and use dependent on the following characteristics that it exhibits:

1) Length: *a measurable quality that proportionally dominates width to a degree where the latter is considered to be negligible*

2) Value: *as lines are considered to be elements that have only length as a measurable quality, anything with a width should be considered as a plane. But in the design language, forms are recognized as lines when their length significantly dominates the width.*

Value refers to our ability to differentiate between lines based on their visual weight that is associated with their thickness.

3) Direction: *a line will define a certain direction that corresponds to the motion of the conceptual element that created is. Such direction is describable as being Vertical, Horizontal, Oblique/inclined*

4) Position: *Another characteristics at a physical level deals with the position of a line in the visual field. The position or location of a line is an important attribute it borrows from the conceptual element of a point that has helped to define it.*

5) Types of Lines: *In our approach to design element definition, we emphasize the manner in which we can emphasize ways of establishing classification among a class of elements. The focus will be on complete understanding of the criteria for classification. In the case of lines as a class of elements, the conditions are to be defined by aspects that are related to the form's visual properties. These aspects are described by Wong as:*

a) *Overall shape of the line: This refers to the general appearance of the form with respect to the direction of the motion of the point that conceptually created it. A line based on these criteria can be straight, curved, bent, irregular*

b) *The Body: This concept relates to thickness of a line. If a form is perceived as a line, then an increase in its thickness or width does not make it a plane. It will remain a line, and can be differentiated as a wide or narrow line. In such cases, a line will have visible edges that define its boundary. The relationship of these edges can be utilized as a basis to categorize lines into tapering, knotty, wavy*

c) *The Extremities: refer to the edges of the two ends of the line. With regard to the thickness of the line described above, if the thickness of the line increases, the shape of the extreme edges of the line can be used as a criteria for differentiation between lines having ends that are round, square, pointed*

(ii) Expressive Characteristics: Lines can be used to express abstract ideas such as feelings and emotions, or realistic features of objects such as contours and elevations.

(iii) Spatial Characteristics: With regard to its placement in the visual field, a line can induce a sense of stability, movement, and energy depending on its direction. A change in its value can produce an effect of advance and receding in the visual space. A single line with value differences can produce effects of twisting in space, etc.

(iv) Representational Characteristics: Lines can be used to represent both abstract ideas or realistic features of objects such as contours and elevations.

(v) Line and the other Forms: A line can serve to:

1) Join, Link, Support, and Surround or intersect other visual elements;
2) Describe edges of or give shape to planes;
3) Articulate surfaces of a plane

(c) Form as a Plane

At a conceptual level, when a line is extended in a direction other than its intrinsic one, it forms a plane. A plane therefore will inherit the properties of a line, direction and position, and in addition have the following main properties:

a) *Overhead Plane: the plane that is placed at the top. A ceiling can be an example of an overhead plane.*

b) *Base Plane: When placed as a base, the top part of the plane surface becomes visible; hence the plane becomes a base plane. A floor can be an example of a base plane*

c) *Vertical Plane: when vertically placed, the surface or surfaces of the plane can be visualized as having a different orientation than the two mentioned above. If placed at an angle, we can get an inclined plane.*

4) Types of shapes

Based on Generic Lines: It is the characteristics and interrelationships of the conceptual lines that define the edges of the form can be used to determine the shape of the planar form:

I. Geometric: such forms are bounded by lines whose relationship is determined using rules of mathematics.
II. Rectilinear: Such forms are bounded by lines which are not mathematically related.
III. Organic Shapes: Such forms are bounded by free curves with no geometric relations
IV. Irregular Shapes: Bounded by straight and curved lines with no apparent mathematical relations

Based on orientation of the surface: Based on the relationship that is established with regard to the orientation of the surface in the compositional frame, the form can be determined as being:

I. Static Plane
II. Dynamic Planes: when a form is positioned on a ground, its orientation can suggest a sense of motion or rest. Based on this, forms are divided into static or dynamic Based on Interrelationship of Generic Planes

I. Positive or Negative Planes: A shape can be perceived as either occupying or as a blank space surrounded by occupied space. This establishes a relationship between the shapes in the visual field. The one occupying the space becomes positive and vice versa.
II. Primary and Secondary shapes: looking at shapes, we can recognize that certain shapes are created from lines while others are generated from the combination of shapes. This helps us to classify shapes into primary and secondary shapes.

1. Uses of Planes
a. In design education:

- Simplify complex shapes and volumes
- Study relationships between components of a shape and volume
- Combined to create complex shapes or forms in three dimensional visual field

(d) Form as a Volume

At a conceptual level, when a plane extends in the dimension that is other than its intrinsic one, it will create a solid. It therefore exhibits all the characteristics of a plane and in addition will have the following:

Form is the primary characteristics of a solid. Form as we have defined earlier is more than just a shape. It is actually measurable in three dimensions and has all the characteristics of a plane incorporated to it.

- o It is determined by the contour of line forming the edges of the solid
- o Used to:
  - Define or enclose space
  - Used to study relationships between components of a volume
  - Used to create a complex form in the three dimensional visual field

Types of Forms: depending on the nature of the shape, they can be divided into:

A. Geometric and Organic Form
B. Regular and Irregular Form
C. Static and Dynamic Form
D. Positive and Negative Form
E. Primary and Secondary Form

PRIMARY SOLIDS: are created from primary shapes. Primary shapes are used to generate solids/forms that have the following characteristics:

Regularity: Objects whose parts are related to one another in a consistent orderly manner.

Symmetrical: we recognize a visual axis about which all parts on both sides of that axis are located at equal distance.
Stable: They appear to be stable in their nature

Shape is something distinguished from its surroundings by its outline within your design. You can make your whole work a certain shape besides the common square, and then have shapes within the design shape. This makes the design more complex.
Form is similar to the idea of shape. Form is the structure of your design and how everything in the design looks like it's meant to go together. If the form is well planned and then carried out, it almost guarantees your design in black and white will be a success.
Space has to be included in your design. Space means leaving some blank areas. Why would you want to leave parts of the design blank? Sometimes a human's eye needs space to feel comfortable, and space will let the human's eye distinguish the part that's meant to be noticed compared to just the background. Sometimes not including space in your design is ok, but make sure it doesn't make it look messy.

Chapter Two

Organization

Data that enters our mind is organized in a two-step process. There is the sensory part were we are interacting with stimuli through the sensory organs. Then, the information collected is assimilated in the mind, compared to existing sets of information and the resultant forms the outlines of what we understand about the stimulant. At this level, we are making an experience of the object of our attention and store our interpretation of the facts about that object.
Perception is the process of making sense of information resulting in not only distinguishing the object of attention, but understanding what the object is about in terms of its meaning based on past experience.

In the entire process, the eye becomes a tool that supplies all visual information:

1. a difference in color implies two distinct objects (or different parts of the same object)
2. a difference in scale suggests one object is further from us than the other,
3. a difference in texture (one is more blurry) enforces this idea, and so on.

Once we have an understanding of the relationships between elements, we can piece together the whole story and understand what we are seeing.

We therefore concentrate on data that enables us to determine what we are looking at. These set of data are called features of objects. We concentrate in part on features of objects to help

us recognize the stimulant in the visual field. But this is not enough to recognize an object. We must have a previously defined object in our memory to compare to in order to determine the name and be able to describe the image that we have recognized.

Understanding Associations in the Process

Therefore, understanding the manner in which we group visual information must be combined with previous knowledge to be able to understand the object of attention fully. therefore always refer to what we know to understand and define new experience. This process is an associative one, where we try to form an understanding of new experience by relating or looking at it with regards to prior information stored in our memory.

ORGANIZATION IN PERCEPTION

In the study of perception, it is always necessary to understand what happens to the information that we receive through our senses. The data that exists in the world is received in an organized manner. It is usually processed as groups and patterns of stimuli that we call objects. Though details are important to the process, we in the end perceive not in terms of measurable qualities such as length or size but rather in terms of objects.

If organization is an activity that is undertaken by our mind in search of defining the data that we receive, we should understand the nature of the mental activity that we will refer to as organizing tendencies.

Organizing Tendencies in the Perceptual Process

Figure Ground the objects that fill our everyday perception are seen as standing out as separable from the ground background. As examples, consider the following:

Text on a page: the text on this page is only visible because we have the white ground on which the contrasting black words are visible. As the information that we transmit is through the text, we make it our focus and the white space, a ground. This is an activity, a choice that is deliberately made in the conscious mind.

Such relationship is basic to all object perception and organizes the information received by our sensory organs with the following perceptual characteristics:

Figure has some sort of shape while ground is formless

Ground extends behind the figure – figure in front, ground behind

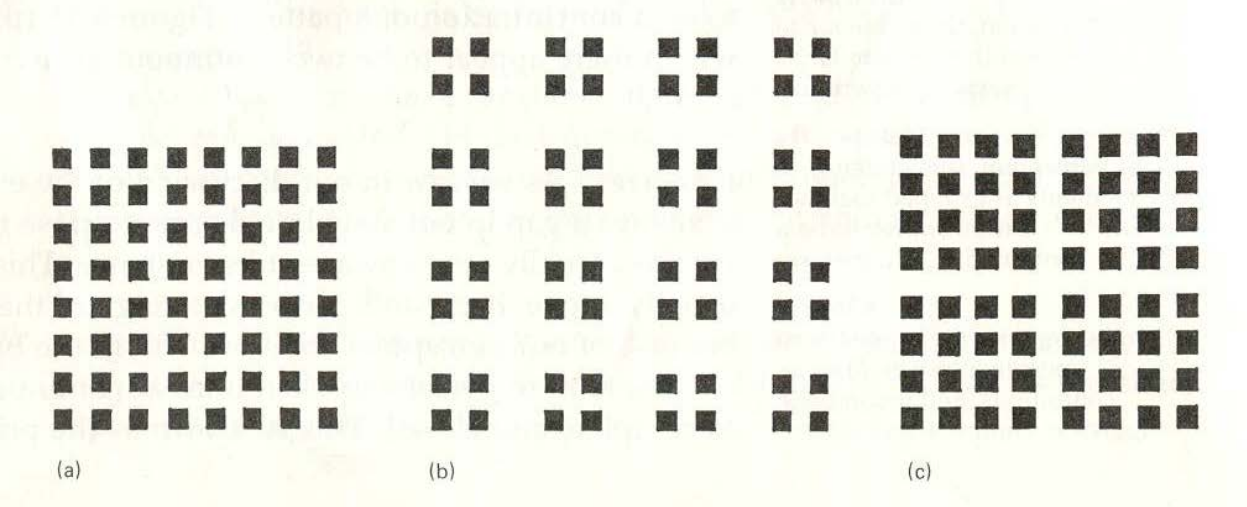
The image to the left is recognizable as a handprint because of the ground that is present. When we

decide to see is as a figure, all the white spaces that are present in the figure are taken as part of the ground, not the figure. We are grouping the figure into two, a figure and ground.

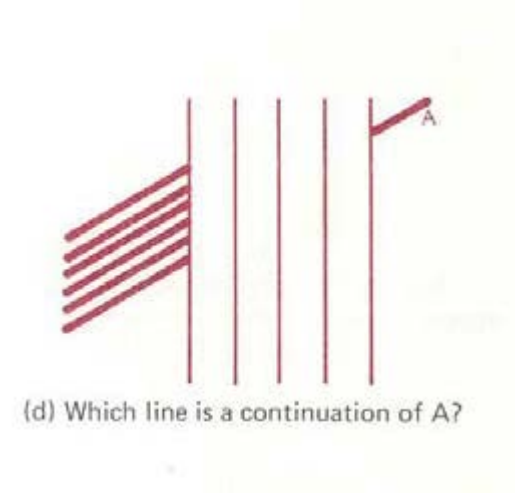
We as designers can create multiple figures that can be perceived as figure or ground.

(2) Grouping: When several stimuli are present, we try to identify perceptual relationships that will help us perceive them as groups of objects rather than single entities. Considering the content on this page, we group the text in terms of words, not single alphabets because we have been taught the structure of a language. In the case of grouping as a perceptual threat, our mind always establishes a certain prevalent relationship as a factor to assemble objects in the visual field in terms of groups.

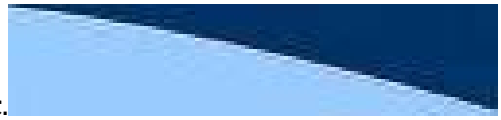
The apparent factors that establish relationships between objects that are grouped can be classified as:
Nearness or Proximity: We tend to compare distances between elements as a quality for deciding which objects belong together as compared to others.
Similarity: We tend to group similar elements together. The path of visual recognition follows similar features of objects such us shape, color, texture, pattern, etc to recognize meanings that are identified in the visual field.

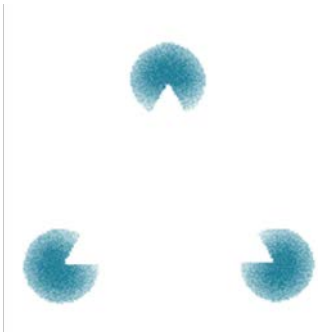


Symmetry or good figure: Tendency to group is tendency to form a balanced figure.
Continuation: we perceive in attempt to understand complex patterns as groups of objects. One characteristic is to group figures as continuations by physically trying to see extensions. Look at the figure to the right.



Contours: we are able to distinguish between figure and ground because we can perceive contours. Contours are formed when there is a market change in color, tone, brightness etc.

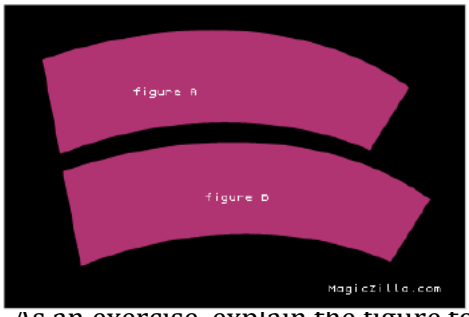




Closure: we tend to perceive whole objects rather than disjointed parts. We fill gaps so as to perceive whole objects.

In the example to the left, we see a triangle at the center because we make a visual line that connects all the corners that are cut from the black circles. We are therefore closing the triangle.

The world as we view it is consistent.



CONSTANCY OF SIZE: Object appears to be the same size irrespective of distances. We for example are able to recognize that a person that is standing is actually taller than us while we are sitting down. This is predominantly because we take our size as a reference in understanding our size relationships with other objects.

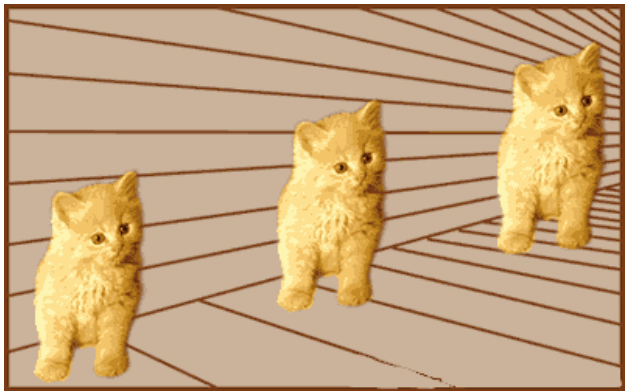
As an exercise, explain the figure to the left.

appear constant in their degree of whiteness, gray blackness. This is irrespective of the amount of illuminator.

2) BRIGHTNESS CONSISTENCY: inconsistency in the visual perception of bright center.

Consistency: The white at the center appears to be bright know that it cannot be, as it is on the same white backer

The knowledge of what brightness consistency is enabled the designer of the example to get a pre-determined reaction from us, the observers. 2-16 Visual objects also ness or tion in the he example to the left was designed to create ghtness at xplain the figure with respect to brightness er, but we ound.



PERCEPTUAL STABILITY: The visual characteristics that we define might be

misleading to the eye. But when we finally make sense of things, we understand the apparent relationship that has distorted our perception of events. Hence, we tend to finally identify and explain the visual properties that distorted our vision.

Organization in Elements of Design

Additive forms will grow to merge with other forms. As designers, if we want our forms to be perceived as a group, the way in which the elements are combined must demonstrate a coherent relationship.

Forms therefore can be categorized based on the existing relationships between component forms, as well as the resulting overall configuration. When we are emphasizing the rule that determines the overall appearance of our composition, we are focusing on defining the structure that determines how the composition has been organized. In such a case, we are referring to principles of organization.

1) CENTRALIZED: As the name suggests, such types of compositions are so organized to simulate a centralized object, one of the regular platonic planes. As an organization of elements to produce an effect, the composition attempts to fulfill the following minimum conditions:

a) Dominant central form: In a composition that is centralized, there will be a dominant form that is located at the center of the compositional field of space and hence is dominant owing to its placement. This central element hence becomes the Primary form in the composition. To emphasize the core concept of the desired composition, the centrally placed object is usually a regular form that is centralized and static.

b) Secondary Forms: Located around the central form will be secondary forms whose presence is significant as they

i) Are used to add to the effect of centrality by being located equidistant from the central object

ii) Are used to contribute to the overall effect by defining a static and stable outer boundary

LINEAR: As the name suggests, such types of compositions are so organized to simulate a line. Therefore, we are trying to create a composition that depicts the properties and characteristics of line as a form, to fulfill the following minimum sets of conditions:

a) Arrangement: In a Linear Composition, elements are arranged in a row, or along a path, having a common direction.

b) Organized along a path:

c) Arrangement Expresses Movement:

3) RADIAL: As the name suggests, such types of compositions are so organized to simulate the physical properties of a radius of a circle. The main property that we can recognize is the fact that radiuses are lines having a common unmarked center as their origin. As lines, they have directions that in our case is perceived to be from the center to the boundary of the circle. Therefore, we are trying to create a composition that depicts the properties and characteristics of group of lines as a form, having a common center, and the following minimum sets of conditions are expected to be met:

a) *Organization where linear forms are arranged extending from a central form.*

b) *Mixture of Linear & centralized organization*

c) *Central Core: is not necessarily dominant, not necessarily geometric center, not necessarily present*

4) GRID: When two or more parallel lines form a regularly shaped field, we have created a grid structure. A grid structure helps us to organize the compositional elements of our choice in a logical pattern

5) CLUSTERED: There are cases where compositions appear to have no organizing logic present. They just appear to be one whole unit merely because of proximity or by sharing a common field.

Types of Composition: Nature and Organization of the Element

I. Composition based on Equality: The end result of such a composition is usually a monotonous one as the elements we use are equal in all their features. There exists no visual tension as the result of their placement and interaction in the compositional plane and there is no dynamic expression perceived, resulting in static and dormant effect.

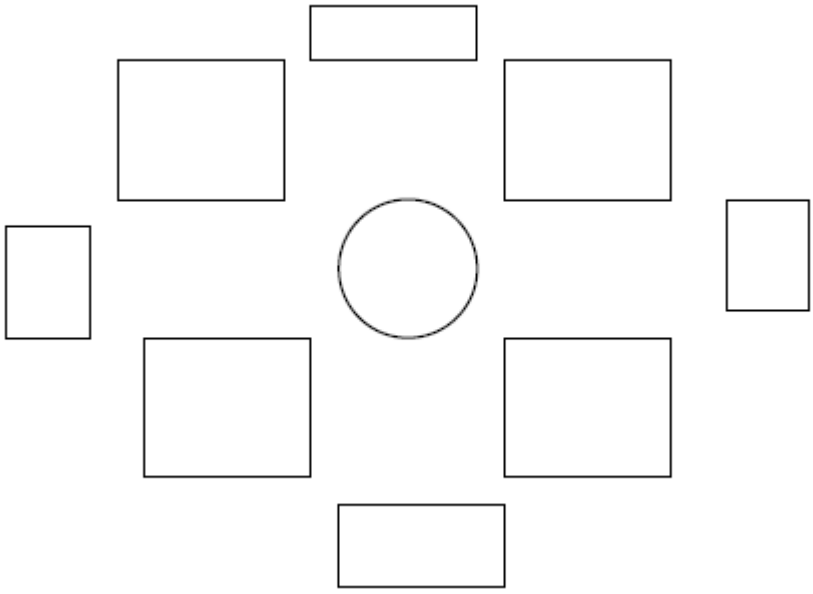
II. Composition based on Similarity: The targeted end result in this case is a harmonious effect produced through the use of elements that are similar in their main feature and yet with differences that are large enough so as to create some degree of visual tension. This could be

achieved by the presence of placement variations creating unequal forces that are in constant interaction, producing a pleasant effect.

III. Composition based on contrast: The target here is to produce an effect of maximum tension produced using elements that are different in their main feature. Contrast enables us to establish differences between elements in opposition.

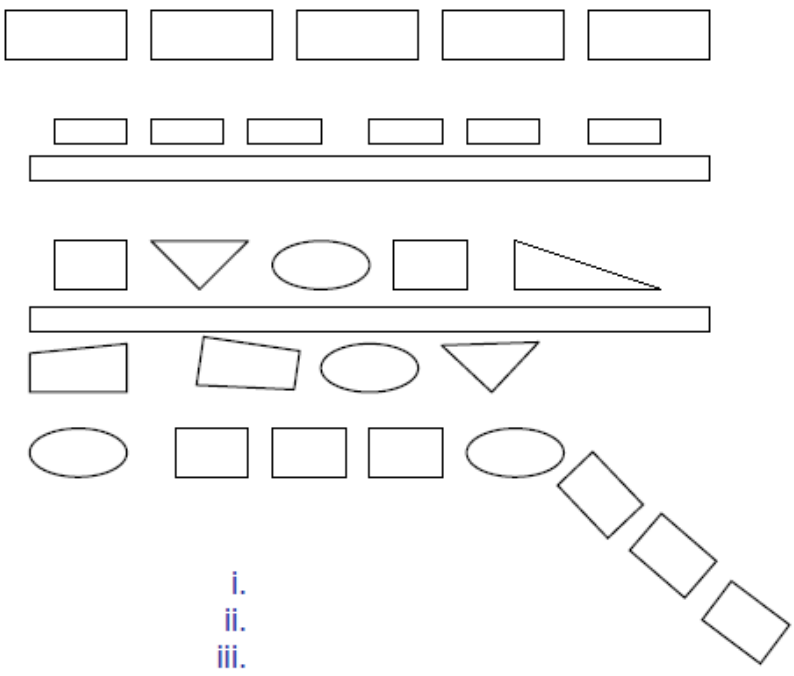
SPATIAL ORGANIZATION: Overall effect suggested by the manner of organization.

I. CENTRALIZED



LINEAR

Linear sequence of repetitive elements



iv. III. RADIAL

A central space from which linear organizations of space extend in a radial manner

IV. CLUSTER

Spaces ground by proximity or by sharing a common visual trait.

Proximity Similar

Shape.

Related by axis

Yet

Not Linear

V. GRID

Spaces organized within a field of structural or 3-Dimensional grid.

ARRANGEMENTS

- The same elements in regular arrangement
  - Monotonous – the single element loses its importance in favor of the arrangement.
- Different elements in regular arrangement
  - Makes quite different shapes more overlookable
  - Symmetry is often used to order quite complicated elements
- Different elements in regular arrangement
  - Chaos, but it can be used to make something very interesting even mysterious.
- The same elements in irregular arrangements
  - Makes simple things more interesting.

ADDITIONAL ORGANIZATIONAL PRINCIPLIES

- Order without diversity can result in monotony of boredom; diversity without order can produce chaos. The following ordering principles are visual devices that allow the diverse forms to co-exist perceptually & conceptually with in an ordered & unified whole.

AXIS

- A line about which forms can be arranged in a regular or irregular manner
- Although imaginary & not visible, an axis is a powerful, dominating, regulating device.
- The specific disposition of elements about an axis will determine whether the visual force of an axial organization is overpowering, loosely structured of monotonous.
- Axiality is associated with linearity. It has qualities of length & direction & induces movement.
- For its definition, an axis must be terminated at both of its ends. The terminating elements of an axis serve to both send & receive its visual thrust.

DATUM

- Refers to a line, plane or volume of reference to which other elements in a composition can relate.
- It organizes a random pattern of elements through its regularity, continuity & constant presence.
- Datum is not limited only to be a line. [Like axis – that organizes a series of elements along its length & axis serves as a datum] it can also be planar or volumetric in form.
- Given a random organization of dissimilar elements, a datum can organize these elements in the following ways:

  Line

  A datum line must have sufficient visual continuity to cut through or by-pass all of the elements being organized. A grid of lines can form a neutral, unifying field for the pattern.

  Plane

A Plane can gather the pattern of elements beneath it or serve as a background & hold the elements in its field.

Volume

A volume can collect the pattern within its boundaries of organize them along its perimeter.

- If planar or volumetric in form, a datum must have sufficient size, closure & regularity to be seen as a figure that can embrace or gather the elements being organized within its field.

HARMONY, UNITY, VARIETY, CONTRAST

HARMONY

- The pleasing agreement of parts of combination of parts in a composition.
- Involves the careful selection of elements that share a common characteristic such as shape, color, texture or material.
- When elements are equal in all features – monotonous, no visual tension.

  Common size
  Common shape
  Similar material
  Similar orientation
- Harmony when carried too far in the use of elements with similar traits can result in a unified but uninteresting composition. Variety, on the other hand, when carried to an extreme for the sake of interests, can result in visual chaos.
- It's the careful & artistic tension between order & disorder - between unity & variety -that creates interest.
  - Introducing variety
  - Varying orientation
  - Varying size
  - Varying texture
  - Varying detail characteristics
  - Varying color

UNITY

Matching or coordinated patterns, closely related colors & stylistic consistency all lead to harmony & unity but they also carry the threat of monotony.

Allows the viewer to experience a design as a whole rather than seeding it as a collection of elements. All the parts of the design will relate so well as to creators unit in which nothing can be added taken away or altered without changing the totality. In order to achieve harmony, all the varied components of a composition must relate to each other & to the overall theme of the design.

VERIETY

Can relieve monotony, giving the eye a number of different shapes, textures, colors or details to look at.

- Unity – can cause monotony or boredom.

- The most extreme case of unity is equality.
- Variety – results in chaos, haphazard elements.

CONTRAST

Heightens values through comparison. A light color will be lighter if placed near a dark color, a large object larger in contrast with something small.

- Strong visual tension.
    - Black & white
    - Organic & geometric
    - Vertical & horizontal
    - Solid & plane
    - Regular & irregular
    - Thick & thin
    - Smooth & rough

Variety & contrast, the countervailing qualities of harmony & unity can relieve monotony, giving the eye a number of different shapes textures colors or details to look at.

BALANCE

- A state of equilibrium among the visual weights of elements.
- Each element in a composition has specific characteristics of shape, form, size color & texture. These characteristics, along with the factors of location & orientation, determine the visual weight of each element & how much attention each will attract in the overall pattern.
- Characteristics that will enhance visual weight are:
    - Irregular or contrasting shapes
    - Bright colors
    - Contrasting textures
    - Large dimensions & unusual proportions
    - Elaborate details
- There are three types of balance: - Symmetrical
    - Radial
    - Asymmetrical

Symmetrical balance

- Results from the arrangement of identical elements, corresponding in shape or form, size & relative position about a common axis or line. It is also called axial or bilateral symmetry.
- Results in quiet, calm, dignified, reposed & stable equilibrium.
- Symmetrical groupings are easily recognized & have a quality of wholeness that can serve to simplify or organize the composition.

Radial balance

- Results from the arrangement of elements about a center point.

- It produces centralized composition that stresses the middle ground as a focal point. The elements can focus inward toward the center, face outward from.
- The center or simply be placed about a central element.

Asymmetrical balance

- Recognized as lack of correspondence in size, shape, color or relative position among the elements.
- To achieve a visual balance, an asymmetrical composition must take into account the visual weight.
- Elements which are visually forceful & attract our attention must be counterbalanced by less forceful elements which are larger or placed farther away from the center.
- Asymmetrical balance expresses movement, dynamicity, being active, change & exuberance.
- Produces equilibrium among elements that differ in size, color, shape or texture.
- Balancing is not related with lines, points, axis of center of gravity of symmetry but on the totality of form.

The achievement of a state of equilibrium B/N FORCES.
Visually we find unbalanced relationships disturbing while balanced relationships look normal, at rest & comfortable.

Brings into equilibrium elements that are equivalent but not matching. The principle is demonstrated by a scale of the type in which an object is weighted by moving a weight loser to or farther
away from a balance point or fulcrum.

SYMMETRY

The most obvious balanced relationship in which the arrangement of forms on one side of an imaginary central dividing line, axis or plane is the mirror image of the other side.

- A symmetrical condition cannot exist without the existence of an axis or center about which it is structured.
- There are two types of symmetry:
  - **Bilateral symmetry**
    - Balanced arrangement of equivalent elements about a common axis.
    - symmetry about a line.

Bilateral symmetry is characteristic of the human body & the forms of many living creatures it's associated with the beauty of nature.

  - **Radial symmetry**
    - Consists of equivalent elements balanced about two or more axes that intersect at a central point.
    - Symmetry about a point.

In building design, the identical visual weights & the importance of the center create an effect of repose & dignity. (Historic building)

REPETITION

- We group elements in a random composition according to:
    - Their closeness or proximity to one another
    - The visual characteristics they share in common.
- Elements need not be perfectly identical however, to be grouped in a repetitive fashion. They may share a common trait, allowing each element to be individually unique, yet belong to the same family.
- Physical traits by which shapes & forms can be organized in a repetitive fashion are:
    - Size
    - Shape
    - Detail characteristics
- It is one way to create unity among different forms.

RHYTHM

- Refers to the regular or harmonious recurrence of lines, shapes forms, or colors.
- It deals with the patterns of repetition that can be utilized to organize a series of recurring elements & the resultant visual rhythms these patterns create.
- The spacing of the recurring elements, 7 thus the pace of the visual rhythm, can be varied to create sets & to emphasize certain points in the pattern.
- While the recurring elements must, for continuity, share a common trait, they can also vary in shape, detail, color, or texture. These differences create visual interest & can introduce other levels of complexity.
- The design principle of rhythm is based on the repetition of elements. This repetition not only creates visual unity but also induces a rhythmic continuity of movements that a viewer's eyes & mind can follow along along a path, within a composition or around a space.

Relates visual elements together in a regular pattern. It can be achieved by repetition as

1 1 1 1

1 111 1 111 1 111

The number one might stand for a window opening, a column. Etc.

The use of rhythm the choice f small or large units, close together or widely spaced should be appropriate to the situation. Since repetition can lead to monotony. It must also be balanced against the need for variety.

HIERARCHY

- Implies degree of importance, articulation or significance of form or shape to an organization.
- It must be made visible unique by treating the shape or form with:

- **Exceptional size**
    - A form or shape may dominate a composition by being significantly different in size than all the other elements in the composition.
    - Dominance is made visible by the sheer size of an element. It can also dominate by being significantly smaller than the other elements in the organization & places in a well-defined setting.

- **Unique shape**
    - Shapes and forms can be made visually dominant by clearly differentiating their shape from that of the other elements.
- **Strategic location**
    - Forms & shapes may be strategically placed to call attention to themselves as being important elements in a composition.
    - Hierarchically important locations for a form or space include:
        - Termination of linear sequence or axial organization
        - Centerpiece of a symmetrical organization
        - Focus of centralized or radial organization
        - Offset, above, below or in the foreground of a composition.
- In each case, the hierarchically important form or shape is given meaning & significance by being an exception to the norm.

Ensures that important elements look important while minor & trivial elements look subordinate. This is achieved through balancing size, placement, value, color & selection of materials.

SCALE

Refers to the proper proportion of an object or space to all other objects, to human beings & to the space to which it belongs.

Small pieces of furniture for example look lost in a large space, while large objects may seem overbearing in a small room.

Good scale is indicated when things look so right that the issue does nor even come to mind.

PROPOTION

Refer to the relationship of parts of design to each other & to the whole.

- Refers to the relationship in terms of magnitude, quality, degree of one part to another or to the whole or between one object & another.
- The apparent size of an object is influenced by the relative sizes of other objects in its environment.
- It depends on culture, personal perception [judgment], distance, texture, viewpoint, color.

Material Proportions- Materials have distinct properties of stiffness, hardness & durability. And they have an ultimate strength beyond which they cannot extend themselves without fracturing, breaking or collapsing.

If we extend the length & thickness of a piece of stone four times keeping the width constant, it would probably collapse under its own weight.

All materials have rational proportions that are dictated by their inherent strengths & weaknesses.

Structural proportions- The size & proportions of structural elements are directly related to the structural tasks they perform.

Proportioning systems

- Our perception of proportion & scale is distorted by the foreshortening of perspective and distance & by cultural biases.
- Small & slight differences in a form's dimensions are especially difficult to perceive.
- A rectangle can appear to be exactly square, almost or very much unlike a square. This is a visual quality that's largely a result of how we perceive its proportions.
- The essence of all theories of proportion is to create a sense of order among the elements.
- Theories of proportion:
    - The golden section
    - The orders
    - Renaissance theories
    - The modular
    - The ken
    - Anthropomorphic proportions

Achieving good proportions is less easy than recognizing them, although many efforts have been made to develop systems for doing so.

- The modular of Le Corbusier bases dimensional units on human body proportions such height & arm reach & extend through numerical manipulation into a system also controlling dimensions & their relationship the modular also makes use of one particular mathematical relationship called by golden section or the golden ration, represented by ------

Golden ration or golden section refers to a proportional relationship that satisfies a certain requirement.

If one divides a line into two unequal segments so that the ration of the short segment to the long segment to the total line length (the short segment + the long segment), this requirement is satisfied.

$$\frac{.618}{1} = \frac{1}{618}$$

This proportion can be found in the designs of many famous structures & various works of art.

There is a strong preference for the golden ration among human beings & a high level of occurrence in nature.

EMPHASIS

- Without emphasis our eye is apt to move restlessly through the composition.
- Ways of emphasis: direction, height, position, color.

HORIZONTALITY & VERTICALITY

- Horizontality creates strong connection to the [especially for buildings]
- Verticality – dynamic equilibrium – has an aspiration to heaven.

TEXTURE

- Specific quality of a surface which results from its 3D structure.
- Used to describe the relative smoothness of roughness of a surface.
- Tactile texture – real, can be felt by touch.
- Visual texture – seen by the eye.
- All tactile textures provide visual but visual texture may be illusory or real.
- Scale, viewing distance [course texture when seen from a distance appears to be relatively smooth] & light [shadow] are important course texture when seen from a distance appears to be relatively smooth.
- The relative scale of a texture can affect the apparent shape & position of a plane in space.
- Textures with a directional grain can accentuate a plane's length or width. Coarse textures, for example, can make a plane appear closer, reduce its scale & increase its visual weight, while polished surfaces appear to be lighter.
- Contrast affects the apparent strength or subtlety of adjacent textures.

PATTERN & ORNAMENT

- Texture & pattern are closely related. Pattern is the decorative design or ornamentation of a surface which is almost always based on the repetition of a design motive.
    - The repetitive design of a pattern often gives the ornamented surface a textural quality.
    - When the elements that create a pattern are so small that they lose their individual identity & bled into a tone.

      Smooth surface are defined by their limits; edges or corners. A patterns surface has visible presence in every part of its extent.

      The fact that pattern is usually repetitious gives it rhythmic qualities on an small scale. For example – strips running vertically make a surface seem narrower & higher, running horizontally, wider & lower.

      Ornament refers to visual extras to show off craftsmanship, introduce variety & enrich a uniform scale.

All of these techniques have, in the end, the same objective. They are means by which the designer can convey his/her idea to the audience of users or viewers. Ideas that will be memorable, meaningful, satisfying & in some way unique to the particular theme are the final goal of all design effort.

FORM DEFINING SPACE
DEFNING SPACE WITH HORIZONTAL PLANE

THE BASE PLANE

- For a horizontal plane to be seen as a figure, there must be perceptible change in color or texture b/n its surface & the plane upon which it lies.
  a simple field of space may be defined by a horizontal plane laying as a figure on a contrasting back ground.

THE BASE PLANE ELEVATED

- The change in level along the edge of elevated plane defines the boundaries of its field & interrupts the flow of space across its surface.
  A horizontal plane elevated above the ground plane establishes vertical surfaces along its edges that reinforce the visual separation b/nits field & the surrounding ground.

The degree to which spatial & visual continuity is maintained b/n an elevated space & its surroundings depends on the scale of the of change.

THE BASE PLANE DEPRESSED

- A horizontal plane depressed into the Ground plane utilizes the vertical surfaces of the depression to define a volume of space.
  The depressed field can be a horizontal plane & remain as integral part of the surrounding space.

  Increasing the depth of depressed field. Weakens its visual relationship with the surrounding space & strengthens its definition.

  Creating a gradual transition from one level to the pother helps to promote the spatial continuity b/n the depressed field & the surrounding.

L – SHASPED PLANES

AN 'L' configuration of vertical planes defines a field of space along a diagonal from its corner outward.
While the field is an introverted one at its inside corner it becomes e traversed along its outer edges.
The field become dynamic in nature & organize itself along the diagonal of the configuration.

With different arrangements, a rich variety of spaces can be achieved.

PARALLEL VERTICAL PLANES

- A set of parallel vertical planes defines a field of space b/n them. The open ends of the field give the space a strong directional quality.
- Since the parallel planes do not meet to form a comer & enclose a portion of the field, the space is extroverted in nature.

U – SHAPED CONFIGURATION OF PLANES

- Defines a field of space that has an inward focus as well as an outward orientation.

- At the rear of the configuration the field is enclosed & well – defined – toward the open end of the configuration, the field becomes extroverted.

Allows the field to have visual & spatial continuity with the adjourning space.

Ways of enhancing definition of space,

If the end of a long, narrow field is open the space will encourage mov't & be conducive for sequence of events. If the field is square, the space will be static & have the character of a place to be in, rather than a space to more through.

THE OVERHEAD PLANE

- Horizontal plane located overhead defines a volume of space b/n itself & the ground plane
- If vertical linear elements such as posts or columns are used to support the overhead plane, they will aid in usually establishing the limits of the defined space.

DEFINING SPACE WITH VERTICAL ELEMNTS

- Vertical forms are generally more active in our visual field than horizontal planes & are therefore in defining a strong in defining a strong sense of enclosure.
- Vertical forms are generally more active in our visual field than horizontal planes & are therefore strong in defining a strong sense of enclosure.
- Three or more columns b/n the inside of the inside of the enclosed space & the outside field.

VERTICAL LINEAR ELEMENTS

- Two columns define a plane, a transparent spatial membrane that's created by the visual tension b/n them.
- Three or more columns can be arrange to define the corners of a volume of space. This space does not require a larger spatial context for its definition, but relates freely to it.

SINGLE VERTICAL PLANE

- The field space a plane fronts on is not well-defined. A plane can establish only of its edges. To define a volume of space a plane must interact with other elements of form.

Color

Additive color

- Color mixing of light, obtained by adding together the wavelengths that represent the three colors considered primary since they cannot be made up by mixing other color:
  Additive primaries – red, blue & green (yellow is produced by adding red & green)

Subtractive color

- The use of pigments & dyes. The object or material absorbs or subtracts all the color of light except the color of the object, which is the color we see.
  If we mix two colors, red & yellow, as paint, the red pigment is subtracting all but red light reflection, the yellow all but yellow, so that the mixture reflects back some red & some yellow, producing a visual impression of orange.
- When dealing with subtractive color the primaries are – re, yellow & blue.

Any color can be exactly described & specified using its three dimensions.

HUE - its position in the spectrum the quality that gives its basic name

VALUE - its lightness or darkness, depends on the amount of light it reflects lighter or absorbs (darker)
Adding wife which reflects all light, lightness a color without changing its hue; the same is true for black.

CHROMA/SATURATION – its intensity or purity – maximum chrome signifies a particular hue in its purest form, adding the hue opposite of it on the color wheel lowers the chrome, making the color less pure & intense.

<u>COMPLEMENTARY COLORS</u>

- In color wheel which places the strongest possible chrome of each hue & found to be directly opposite across in a straight line (form) a hue that we think of as opposite in character (complementary colors).
- Mixing two complementariness – adding together the three primaries results, in the subtractive color of dyes & pigments, in a neural gray. In reality the actual color may be a brownish or bleach natural rather than the theoretical natural gray of the color systems.

WARM & COOL COLORS

Looking at the color wheel, we see that the circle is divided through its center into 2 families of color that make a strongly different impression. A clear mental association between the colors & the temperature sensations of hot & cold is established. A complementary pair is always made up of one warm & one cool color.

WARM COLORS

- Red, orange, yellow…
- Raises the apparent room temperature, making spaces feel cozy & pleasant in doors summer.
- Conveys a sensation of warmth, both physical & emotional
- Appear closer than they actually are.

COOL COLORS

- Green, blue, violet…
- Provides relief on a hot day or in a warm climate.
- Suggest formality reserve & communicate a sense of physical coolness as well.
- Recede, appearing farther away

PSYCHOLOGICAL IMPACT OF COLORS

- Regardless of contextual difference among peoples in perception of meaning colors, let' us see the generally accepted associations for various hues.

RED

- Warm, even hot, exciting & stimulating.
- Associated with tension & danger (heat & fire)

- Strong reds & greens together in large areas can generate unpleasant tensions.

YELLOW

- Mildest of the warm colors, associated with cheerfulness even humor
- Give strong effect of brightness white suggesting less tension than reds & oranges,

GREEN

- Cool color closest to warm
- Calm & restful, peaceful & constructive

BLUE

- The coolest of cool colors, suggesting rest & repose, calm & dignity.

VIOLETS

- Along with its stronger version – purple, has reputation as problematic & unsafe color.
- Often seen as artistic, suggesting subtlety & sensitivity but at the risk of conveying ambiguity.

WHITES

- Suggest clarity, openness & brightness.
- White is always a safe color & its association with cleanliness & sanitation is an obvious one.