

Role of Elements and Principles of Design in Architecture

Aarti Nagpal

School of Planning and Architecture, New Delhi.
E-mail: aarti15j.spa@gmail.com

Abstract—Architecture is the Art and Science of Designing and Constructing Buildings. Elements and Principles of Design are used in Architecture for designing buildings and other habitable environments. Architecture also consists of a dynamic and inseparable fusion of Art and technology. Aesthetics has a great role in Architecture which is linked by Elements and Principles of Design. We can define Aesthetics as the branch of philosophy that deals with the nature of art, beauty and taste, with a view to establishing the meaning and validity of critical judgements concerning works of art. The Elements and Principles of Design are an extremely useful tool for understanding visual arrangement. There is a great role of Elements and Principles of Design in Architecture. It serves an important purpose of initiating creativity and thereby appreciation of art in many forms. Elements and Principles of Design are the components of Aesthetics. Before examining the basic elements of Aesthetics, it is necessary to understand something of the nature of seeing or observation. The act of seeing is simultaneously an act of organization. In looking at a piece of Architecture we see the principle visual qualities like mass, form, outline, emphasis, light, shade, texture, pattern etc. Each visual impression evokes in the observer a corresponding emotional reaction. The sum of these impressions creates an emotional state which an Architect must understand and anticipate in order to succeed as a designer. This paper illustratively demonstrates successive observations regarding Elements and Principles of Design and its influence on architecture.

1. INTRODUCTION

The Elements and Principles of Three-Dimensional (3-D) Design

DESIGN: We can define Design in following ways:

- The creation and organization of formal elements in a work of Art.
- To conceive or device the form and structure of a building or other construction.

ELEMENTS: We can think of the elements of design as a collection of abstract tools. They can be combined and arranged in any way we like to create some sort of visual statement. The elements of design are the raw materials or building blocks for any form of visual expression. By looking at our work in terms of each individual element we are better able to analyze and understand what we are creating. When we analyze any form of visual expression, consciously

considering it in terms of the elements and principles of design gives us a broad platform on which to base our judgments.

PRINCIPLES: These are basic rules or guidelines for any action, idea, reasoning or thought. These are applicable in all aspects of life. If the elements of design are the raw materials or building blocks for any form of visual expression, then the Principles of design are a list of things we can do to those elements. When considering any form of visual art we can analyze each design element in terms of the individual principles.

There are various types of elements and Principles of Design (I consider the list here covers all possible options in the most economic way):

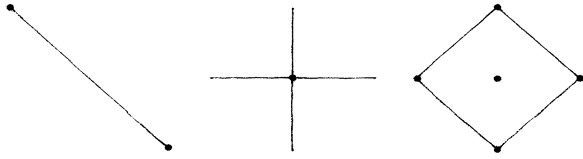
| S. No. | Elements of design | S. No. | Principles of Design |
|--------|-------------------------------------|--------|----------------------|
| 1. | Point | 1. | Balance |
| 2. | Line | 2. | Rhythm |
| 3. | Plane | 3. | Scale and Proportion |
| 4. | Mass/ Volume | 4. | Dominance / Emphasis |
| 5. | Form/ Shape: positive and negative. | 5. | Unity |
| 6. | Texture | 6. | Harmony |
| 7. | Colour | 7. | Abstract |
| 8. | Space: positive and negative. | 8. | Contrast/ Variety |
| 9. | Value | 9. | Order |

2. ELEMENTS OF 3-D DESIGN

Point—It is an element that has position, but no extension. It is a single mark in space with a precise, but limited, location.

As the prime element in the vocabulary of form, a point can serve to mark:

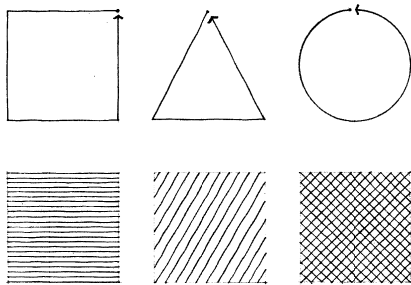
- the two ends of a line.
- the intersection of two lines
- the meeting of lines at the corner of a plane or volume
- the center of a field.



Line-is an element characterized by length and direction. A Line is a critical element in the formation of any visual construction

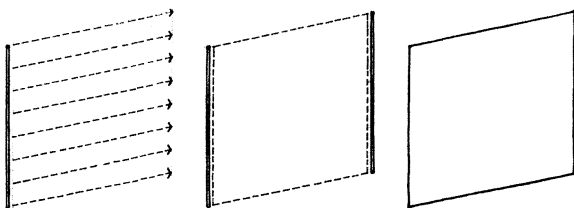
Lines can exist as elements in themselves or they can be used to produce other elements.

- A closed line will define a shape.
- Hatched lines will produce a tone.
- A buildup of lines will create texture.



Planes in architecture define three-dimensional volumes of mass and space.

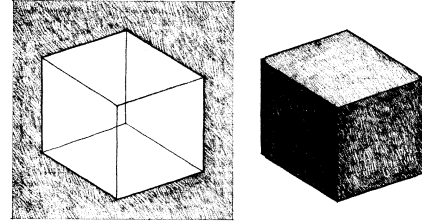
The properties of each plane—size, shape, color, texture—as well as their spatial relationship to one another ultimately determine the visual attributes of the form they define and the qualities of space they enclose.



Mass/Volume: All volumes can be analyzed and understood by:

- points or vertices where several planes come together
- lines or edges where two planes meet
- planes or surfaces which define the limits or boundaries of a volume.

Sometimes mass refers to a positive solid and volume refers to a negative, open space surrounded by material, as in a bowl or other vessel.

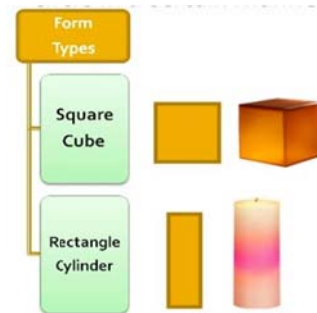


Shape-is a 2-dimensional line with no form or thickness. Shapes are flat and can be grouped into two categories, geometric and organic.

Form-is a 3-dimensional object having volume and thickness. It is the illusion of a 3-D effect that can be implied with the use of light and shading techniques. Form can be viewed from many angles.

Form/ Shape-is the simplest definition of shape is a closed contour, an element defined by its perimeter. The three basic shapes are: circle, rectangle (square) and triangle.

Positive shape is the totality of the mass lying between its contours; in three-dimensional work, the visible shape or outer limit of a form changes as the viewer's position is changed. These outer limits are seen as shapes moving back and forth between major contours. Negative space is empty space defined by positive shape. Sometimes referred to as occupied and unoccupied space.



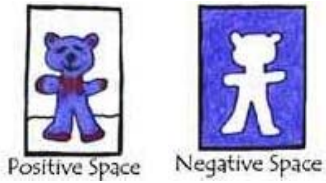
Texture-is about surface quality either tactile or visual. Texture can be real or implied by different uses of media. It is the degree of roughness or smoothness in objects.



Brick Wall texture

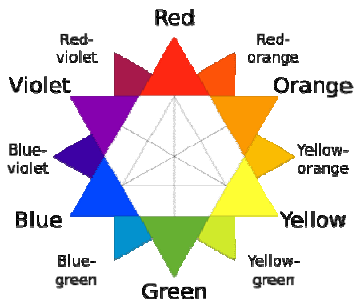
Space-refers to variations in the proportions of objects, lines or shapes. How shapes are arranged in an Art or Architectural work creates a sense of Space.

There is a variation of sizes in objects either real or imagined. (some sources list Proportion/Scale as a Principle of Design)
Distance, area, volume; physical space independent of what occupies it; absolute space.



Colour-is the response of the eye to differing wavelengths of radiation within the visible spectrum. It is the visual perceptual property.

- Color categories and physical specifications of color are also associated with objects, materials, light sources, etc., based on their physical properties such as light absorption, reflection, or emission spectra.



Colour Wheel

Value can be used with color as well as black and white.

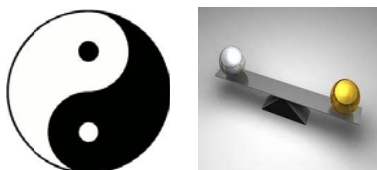
Contrast is the extreme changes between values.



3. PRINCIPLES OF 3-D DESIGN

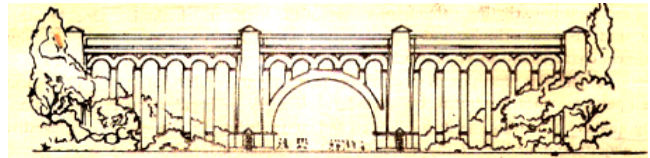
Balance It is the arrangement of the objects in a given design as it relates to their visual weight within a composition. Balance usually comes in two forms: symmetrical and asymmetrical.

Formal / Symmetrical Balance: equal visual units right and left/ top to bottom of an imaginary center point.



Rhythm–It is a movement in which some elements recurs regularly. Like a dance it will have a flow of objects that will seem to be like the beat of music.

- It create a sense of movement, and can establish pattern and texture. There are many different kinds of rhythm, often defined by the feeling it evokes when looking at it.
- Rhythm is the result of repetition;

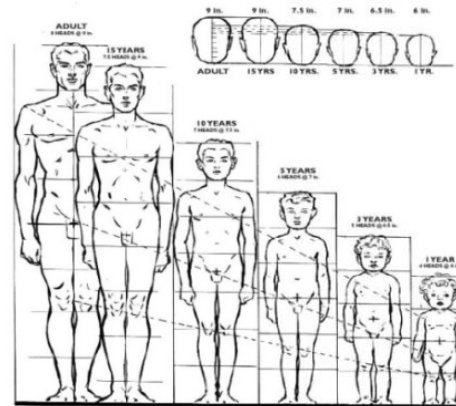


Scale refers to the size of an object or objects in relation to the surroundings. Size refers to definite measurements while scale describes the size relationship between adjacent objects.

- It is the proportion of one object to another. It also means the relationship of an object with a designated standard such as a building or a person.

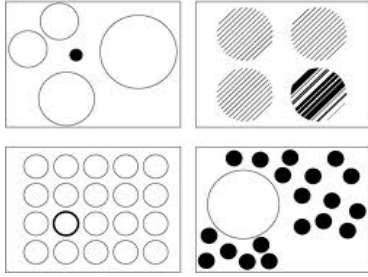
Proportion-It is the relationship in scale between one element and another, or between a whole object and one of its parts.

- Differing proportions within a composition can relate to different kinds of balance or symmetry, and can help establish visual weight and depth.

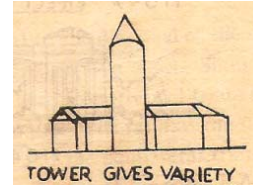


Dominance- relates to varying degrees of emphasis in design.

- Something in the work must dominate. A high point or climax occurring in the work, or the domination of a motif or design element.
- Stress or prominence given to an element of a composition by means of contrast, colour , shape etc.

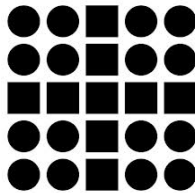


Contrast means absence of monotony. In Architecture it is used for creating interest and exhibiting variety. Different qualities or characteristics in a form; interest generated in a work by using a variety of shapes, forms, textures and so on.



Unity-The concept of unity describes the relationship between the individual parts and the whole of a composition.

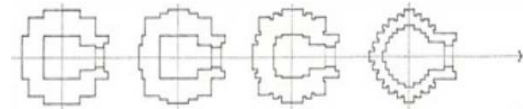
It investigates the aspects of a given design that are necessary to tie the composition together, to give it a sense of wholeness, or to break it apart and give it a sense of variety.



Order: This concept is related to the overall organization and structure of a design. Order without diversity results in monotony or boredom.

Examples:

Axis, Symmetry, Hierarchy, Rhythm, Datum and Transformation.



Harmony is the visually satisfying effect of combining similar or related elements.

- Elements are combined to:
 - a. Accent their similarities.
 - b. Adjacent colors.
 - c. Similar shapes.

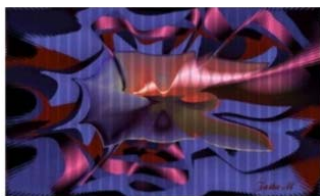


4. CONCLUSION

It can be inferred from the above tabular data, that students with good Basic Design know how (knowing Elements and Principles of Design), can well-equipped to handle spaces in Architectural Design at the senior level as well as in their professional practice. Finally, the journey in advance role of Basic Design originates with the basic elements and transforms into Principles of design to get desired results in Architecture.

Abstract does not reflect any form of conventional reality, all you see are lines, shapes, colours and patterns.

It indicates a departure from reality in depiction of imagery in Art.



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