

PROJECT LEAD THE WAY

PLTW

Elements and Principles of Design

Visual Design Elements

Eight integral components used in the creation of a design:

- Point
- Line
- Color
- Value
- Shape
- Form
- Space
- Texture

Point

- Most basic element of design
- Has position but no dimension
- Can be described by coordinates on a plane
- Used to indicate a location

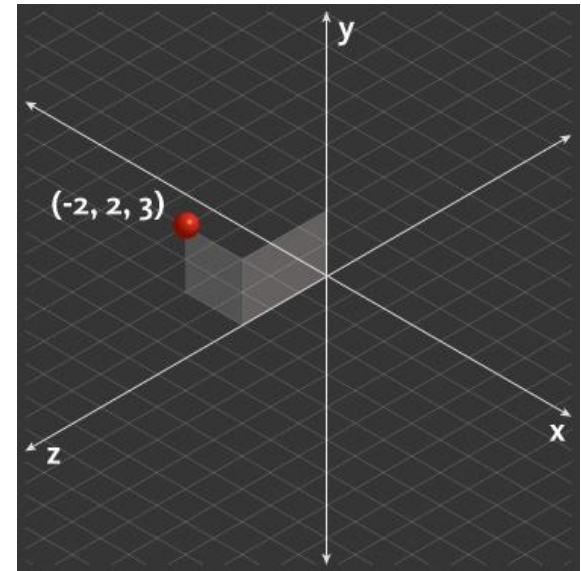


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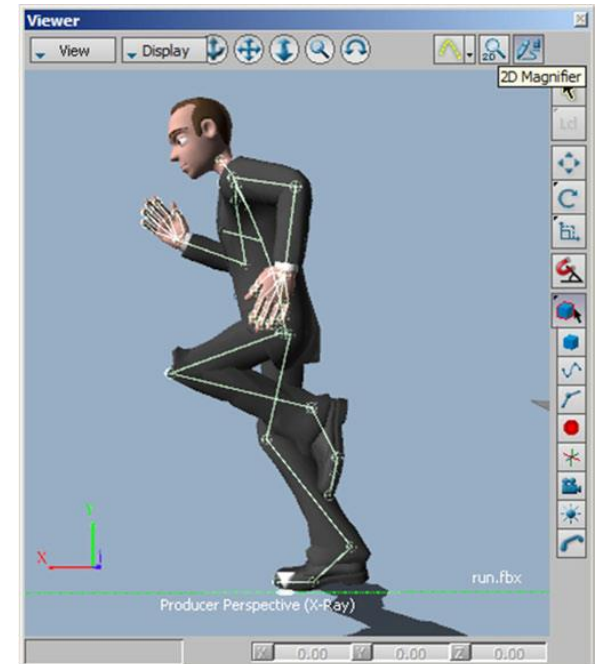


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Line

- Has only a length dimension
- Can be used to
 - Define a boundary
 - Indicate volume
 - Create perspective and depth
 - Create textures and patterns
 - Suggest movement
 - Imply emotion

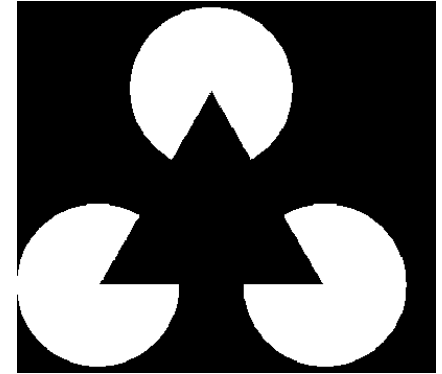


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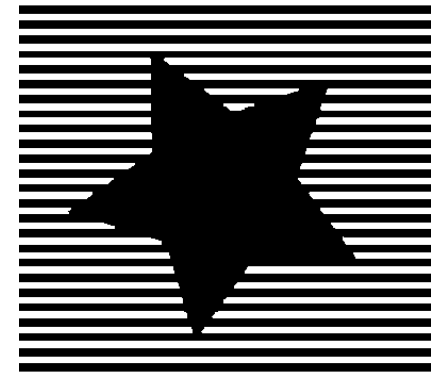


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Line

Types

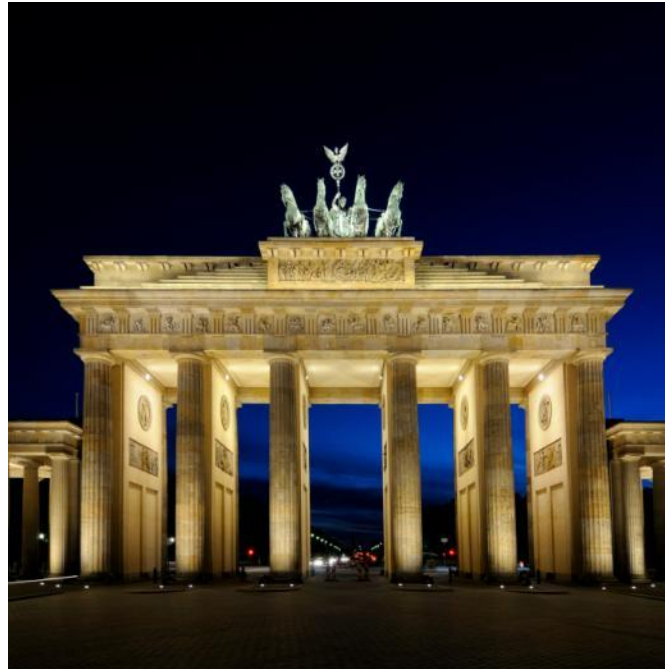
- Vertical - Represents dignity, formality, stability, and strength
- Horizontal - Represents calm, peace, and relaxation
- Diagonal - Represents action, activity, excitement, and movement
- Curved - Represents freedom, the natural, having the appearance of softness, and creates a soothing feeling or mood

Vertical Lines

- Vertical lines characterize dignity, formality, stability, and strength

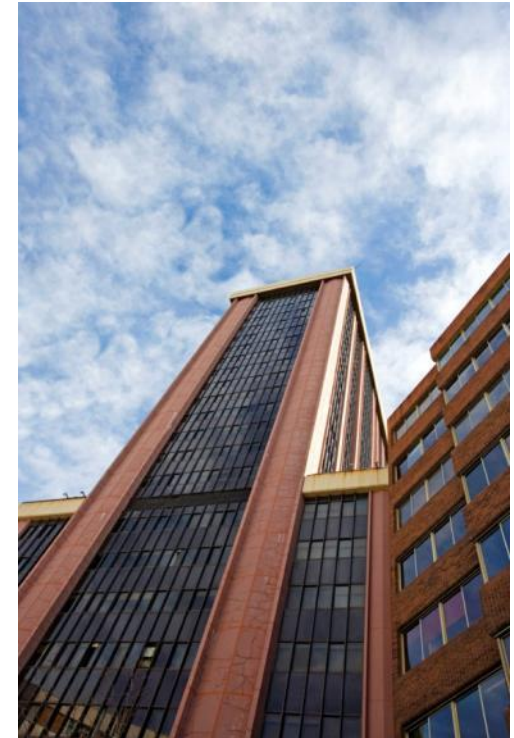


The Empire State Building
Architect: Shreve, Lamb, and Harmon



Microsoft Office clipart

Brandenburg Gate
Berlin



Skyscraper
Madrid, Spain

Horizontal Lines

- Horizontal lines represent calm, peace, and relaxation



Community Christian Church
Kansas City, MO
Architect: Frank Lloyd Wright, 1940

Diagonal Lines

- Diagonal lines give the sense of movement, action, and activity.



Curved Lines



Microsoft Office clipart

- Curved lines give the sense of freedom and a soothing mood



Sydney Opera House
Jorn Utzon

Color

Described by a number of qualities

- Hue: base color (e.g., red)



- Value: lightness or darkness



- Saturation: purity or intensity relative to gray



Color Temperature



Image courtesy Autodesk, Inc.

Cool Colors

Blues, purples, greens

Warm Colors

Reds, oranges, yellows

Color

- Color has an immediate and profound effect on a design



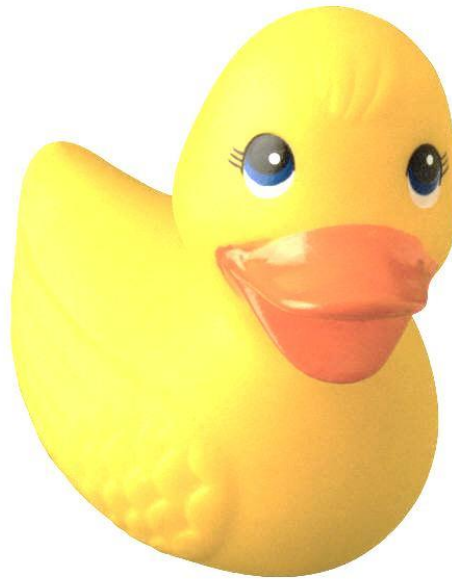
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Value

- Relative lightness or darkness of a color, object, or shape



Value

- Allows us to perceive shapes and the illusion of 3D objects on a 2D surface

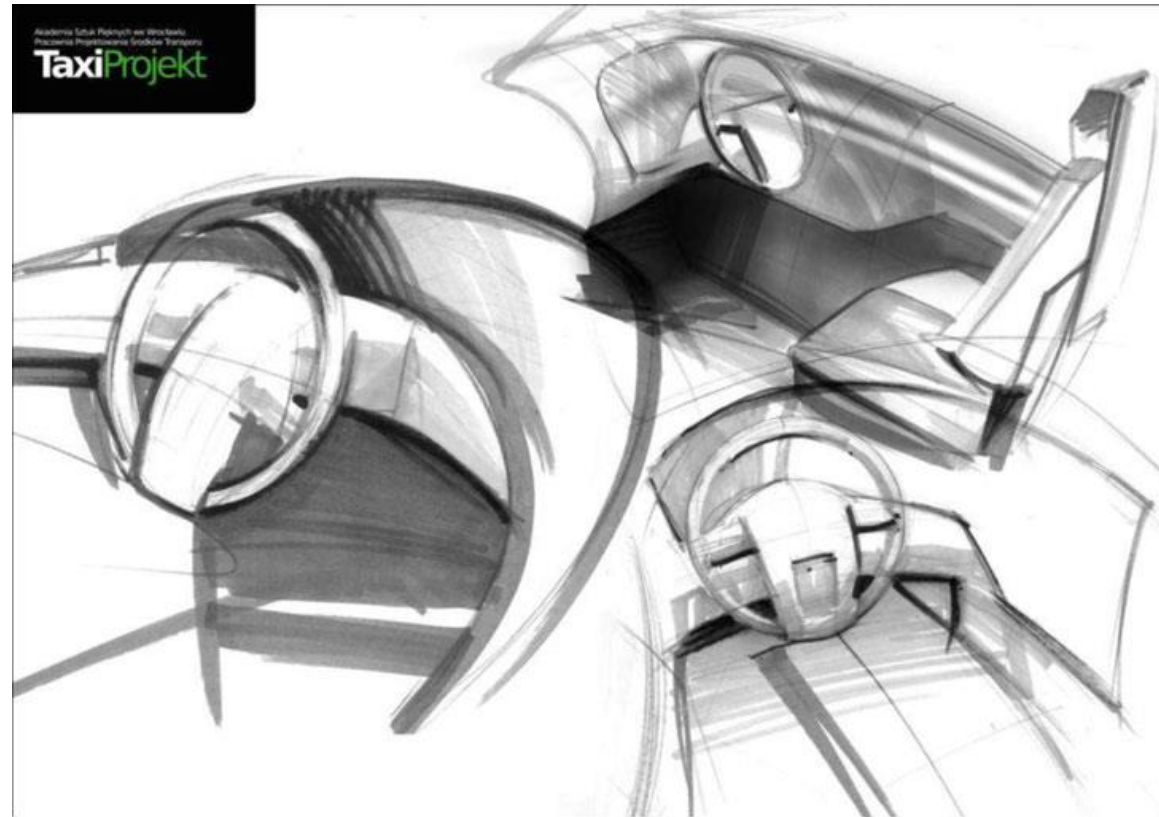
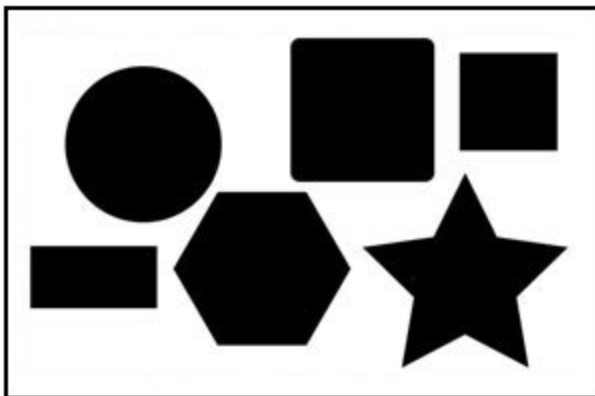


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Shape

- A 2D area enclosed by lines or curves
- Types
 - Geometric: square, circle, triangle
 - Mechanical: simple shapes made of straight and curved lines
 - Organic: natural or simulating nature



Geometric



Mechanical



Organic

Form

- A 3D volume or solid
- Often implied on a 2D surface by careful use of value

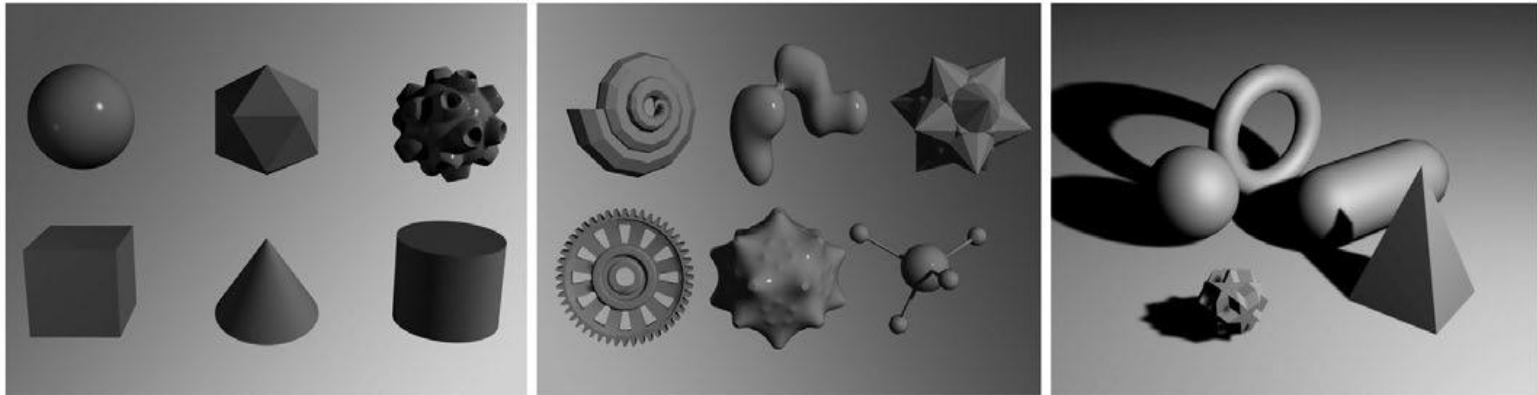


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Form



Oriental Pearl Tower
Shanghai
Architect: Jiang Huan Cheng,
Shanghai Modern Architectural
Design, Co.



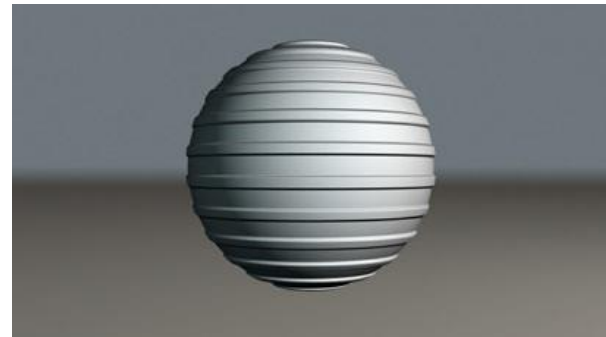
Ancient Egyptian Pyramids

Space

- Areas between and around parts of an image or the implied depth in that image
- Types
 - Positive
 - Negative



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**Negative
Space**

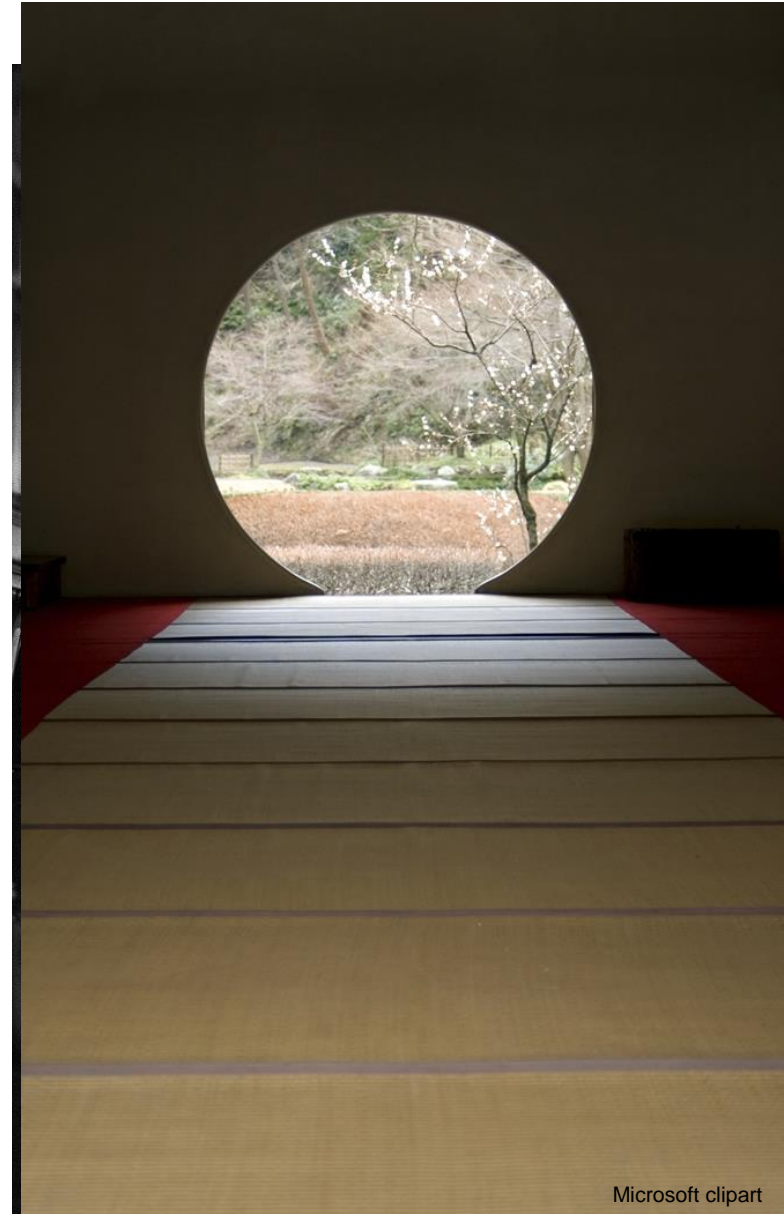


**Positive
Space**

Image courtesy Autodesk, Inc.

Space

- Evident in images with depth
- Types
 - Open, uncluttered
 - Cramped, busy



Texture

- The surface look or feel
- Types
 - Smooth
 - Reflects more light
 - More intense color
 - Rough
 - Absorbs more light
 - Appears darker

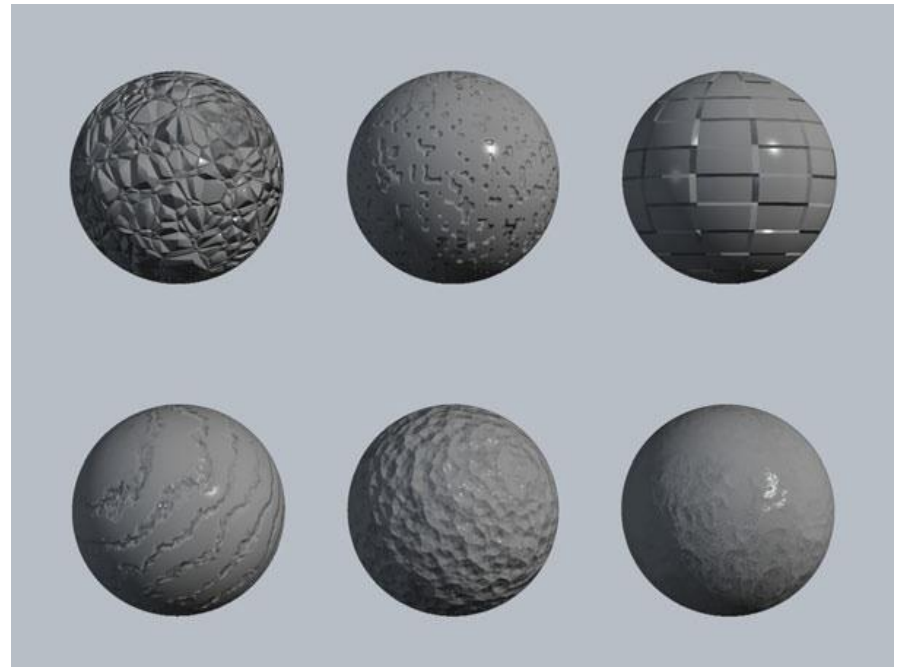


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Texture

Smooth



Exterior metal façade of Disney
Concert Hall
Los Angeles

Fluffy



Rough



Park Guell – Barcelona, Spain
Architect: Antonio Gaudí

Principles of Design

- Many principles add to an interesting design

- Balance

- Proportion

- Emphasis

- Unity

- Contrast

- Economy

- Rhythm

Balance

- Visual and physical balance
- The distribution of elements within a design
- Types
 - Symmetrical (formal)
 - Asymmetrical (informal)
 - Radial

Symmetrical (Formal) Balance

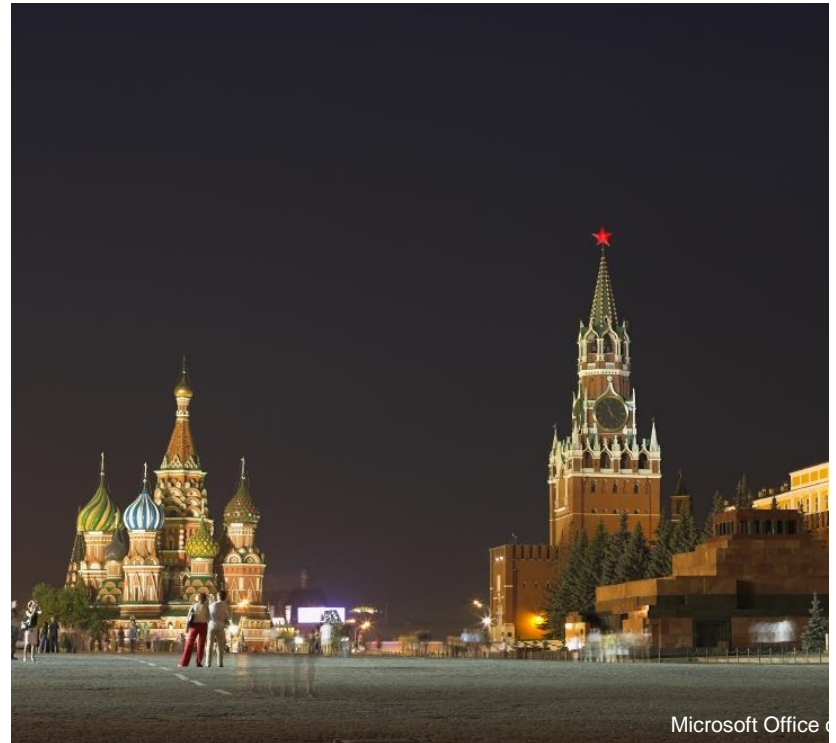
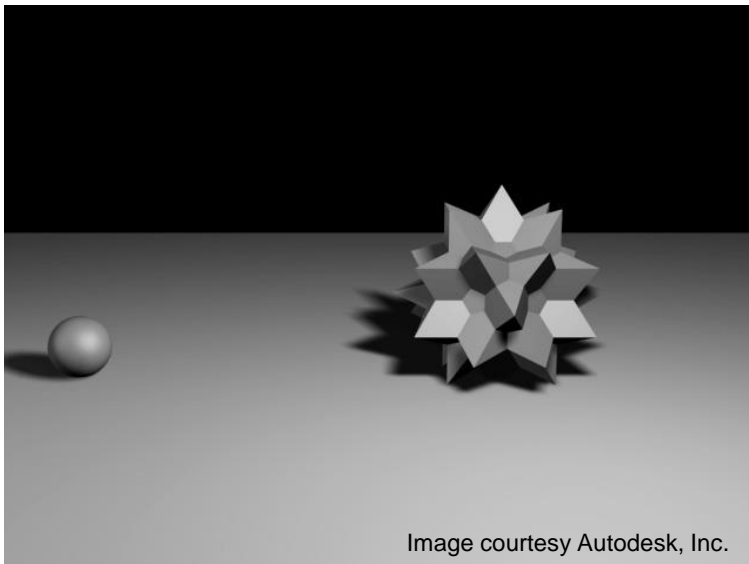
- The elements within the design are identical in visual weight in relation to a centerline or axis



The Taj Mahal Mausoleum
Agra, Uttar Pradesh, India

Asymmetrical (Informal) Balance

- The elements within the design are not identical but are arranged to provide a balanced visual weight



Radial Balance

- Distribution of components in a circular pattern around a center point



Dresden Frauenkirche
Dresden, Germany

Emphasis

- Used to draw attention to one area
- Focal Point – feature in a design that attracts the eye
- Can be achieved through
 - Size
 - Placement
 - Shape
 - Contrast
 - Use of lines

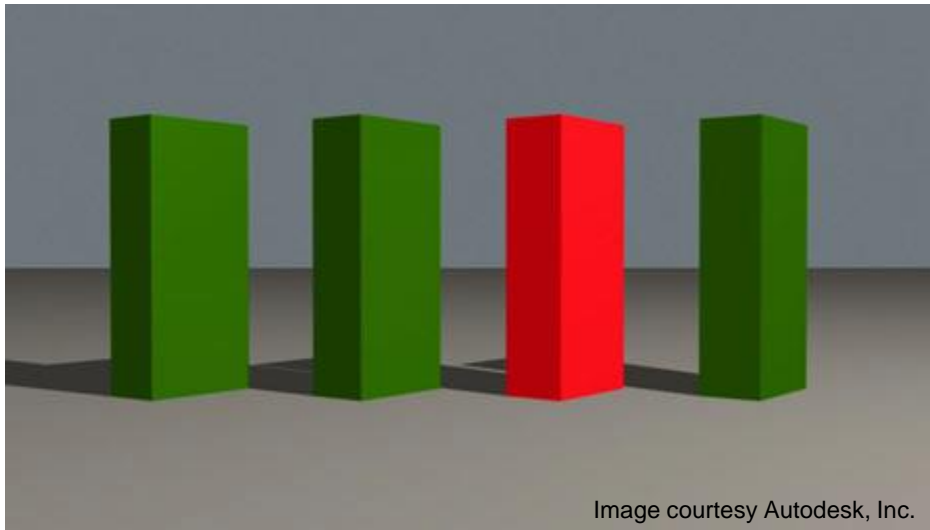


Emphasis



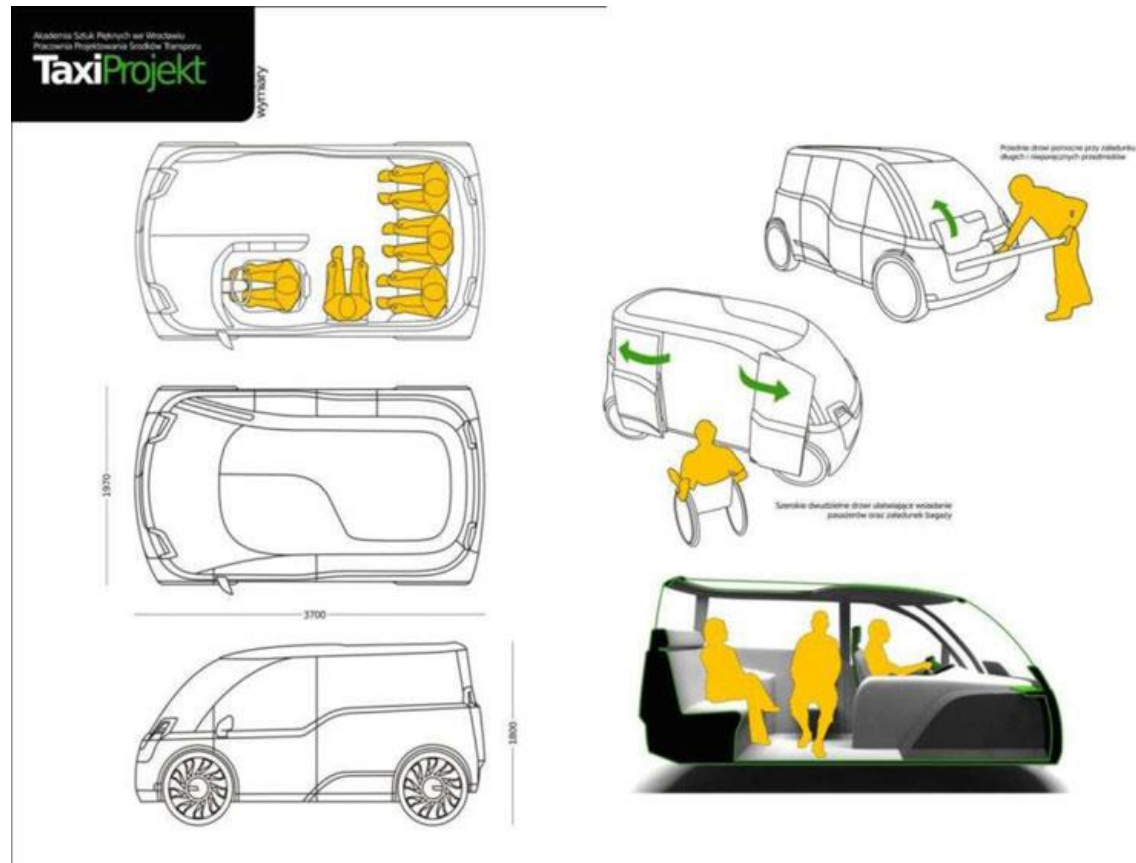
Contrast

- The degree of relative difference between elements



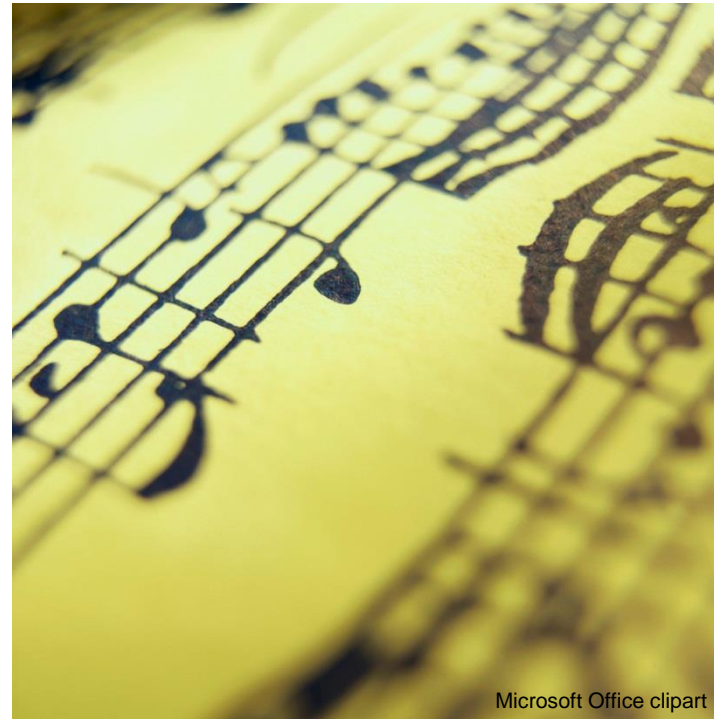
Contrast

- Can be used to emphasize an element of a design



Rhythm

- Repeated use of line, shape, color, texture or pattern
- A harmonious pattern or sequence
- Types
 - Regular
 - Random
 - Gradated
 - Graduated



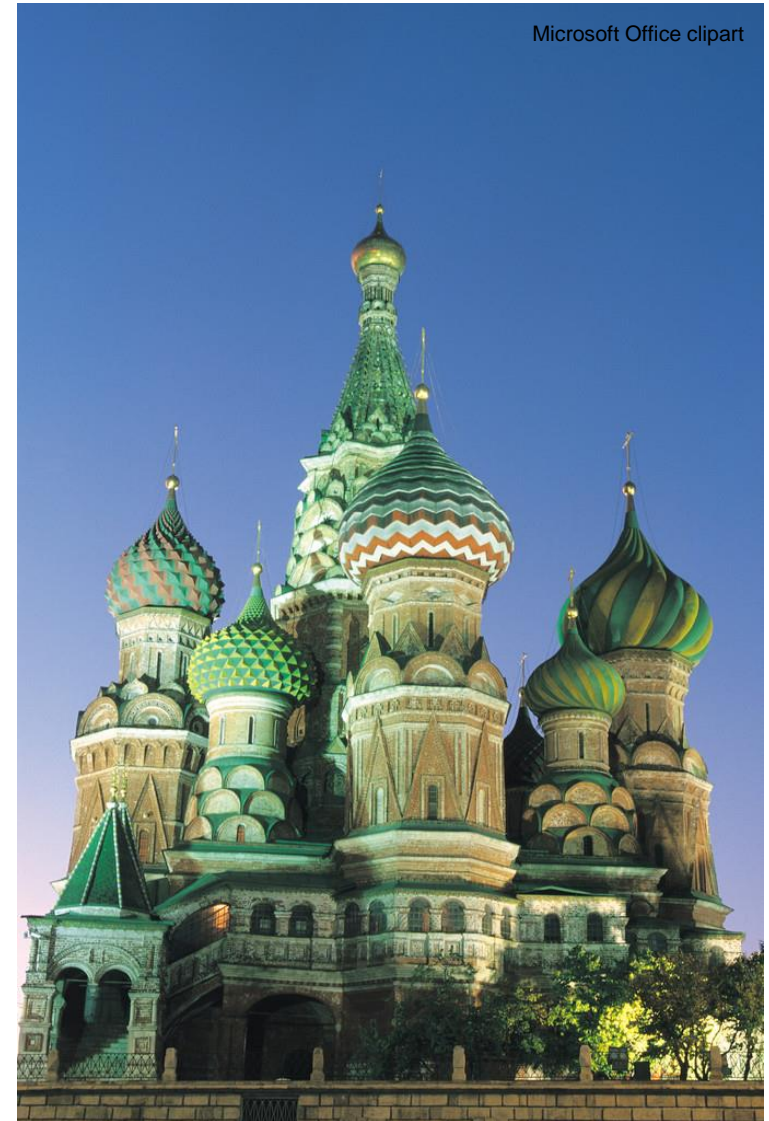
Regular Rhythm

- An element is repeated at the same repetition/interval



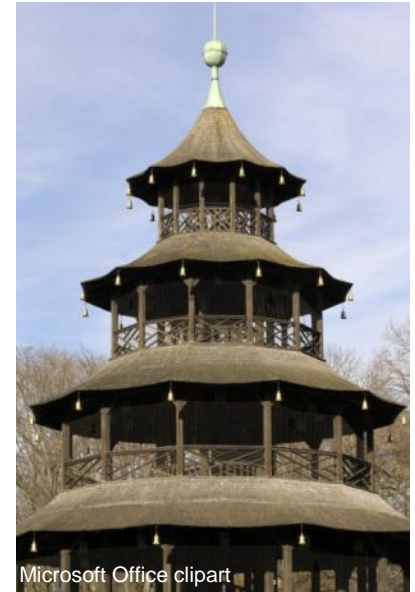
Random Rhythm

- The repetition of the element is random or situated at irregular intervals



Gradated Rhythm

- The repeated element is identical with the exception of one detail increasing or decreasing gradually with each repetition



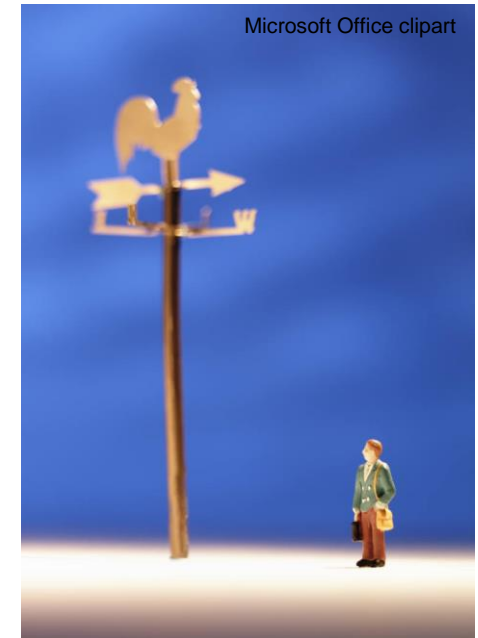
Graduated Rhythm

- The repeated element becomes closer or further apart



Proportion

- Comparative relationship between elements in a design with respect to size
- Scale – The proportion or size of an element in relation to the other elements



Unity

- The consistent use of design elements



Economy

- Use of the bare minimum of elements
- Can be achieved by removing extraneous elements
- In simplicity there is beauty
- Less is more



Image courtesy Autodesk, Inc.

Economy

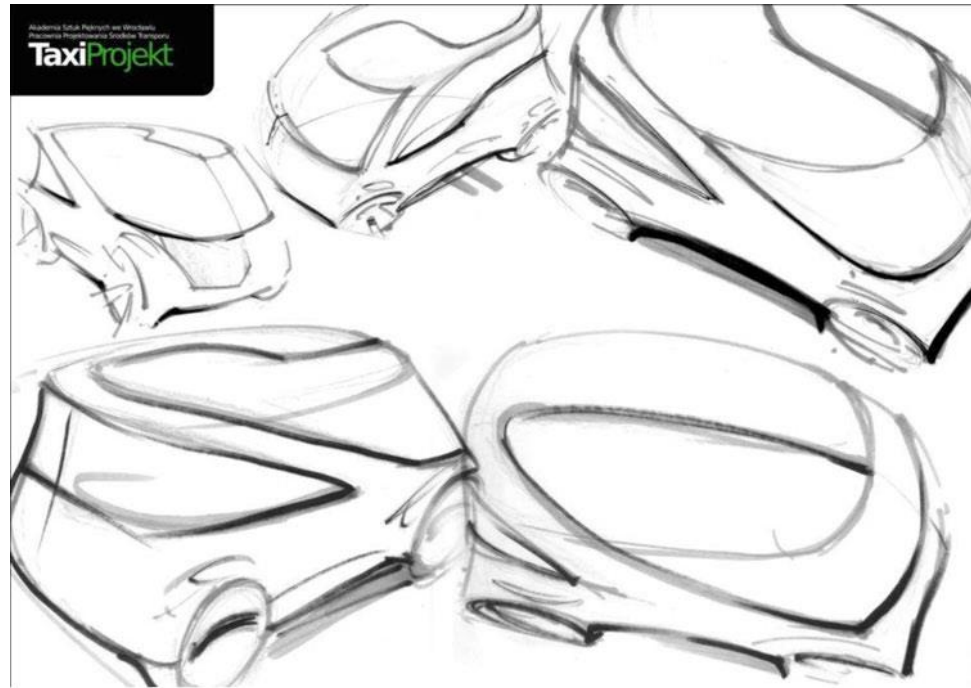


Image courtesy Autodesk, Inc.



Image courtesy Autodesk, Inc.

Visual Design Principles and Elements Matrix

		Elements of Design							
		Point	Line	Color	Value	Shape	Form	Space	Texture
Description of Use of Element of Design		n/a	Straight edges and curved top surface	Bright green and red	n/a	Geometric shapes - rectangular and circular	Solid forms created by rectangles and circles	Space around circular openings in top. Depth evident in holes.	Smooth
Principles of Design	Balance					Formal Balance created by symmetry	Formal Balance created by symmetry	Formal Balance created by symmetry	
	Emphasis			Red color emphasized against green background					
	Contrast		Curved top edge contrasts with straight edges on sides	Red and green colors contrast					
	Rhythm					Regular rhythm created by repeated use of circular holes			
						All shapes seem proportional and appropriate for function	All forms seem proportional and appropriate for function		
						Consistent use of geometric shapes			Consistent smooth texture
		Simple lines				Simple shapes – no extraneous elements			

