

The ORIGINAL IDEX California® Prep Class

Interior Design Fundamentals

Elements of Design

- They are the **most basic visual components** of any composition
- The elements are the materials upon which the principles of design act
- Designers discover, incorporate, and balance these elements to create a **strong solution to a given problem situation**
- The elements of design may vary by source but often include:
 - **Point** - something that has position but not extension
 - **Space** – an area found within an enclosure
 - **Shape** – the contour of an object
 - **Tone** – the degree or value of absorption or reflection in color such as a shade or tint
 - **Form** – the essential distinguishing nature of the design
 - **Mass** – volume outlined by the shape
 - **Line** – forms the direction and feeling of the design
 - Vertical line provides a feeling of height, strength and dignity
 - Horizontal line creates a feeling of repose and solidity and also provides strength
 - Diagonal line gives a feeling of action and movement
 - Curved line has a graceful and delicate effect on a room
 - **Texture** – the surface quality of objects
 - **Pattern** – a decorative design
 - **Color** – most vital and expressive element of design

Principles of Design

- The number and names of the principles of design can be variable
- The principles **govern the relationships of the elements used and organize the composition as a whole**
- The elements and principles work together to create **harmony** by blending unity and variety
- There is no hard and fast rule for their use - it is directed by intent
- The designer's purpose drives the decisions made to achieve appropriate scale and good proportion, as well as the degree of harmony between all the elements achieved through the sensitive balance of variety and unity
- Awareness of the elements and principles is the first step in creating successful visual compositions
- Most lists include:
 - **Scale** – compares an item or space to something of a known size
 - **Proportion** – does not depend upon a known size for relativity
 - **Balance** – establishes a sense of relativity and repose
 - Symmetrical or formal balance – identical objects arranged equally on each side of an imaginary line
 - Asymmetrical balance – Unlike objects balancing on each side of an imaginary line
 - Radial balance – elements of design radiate from a central point

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- **Rhythm** – creates a flowing pattern around a room
 - Repetition – repeating color, pattern, texture, line, light or form
 - Transition – a curved line that carries the eye over an architectural element
 - Gradation or progression – succession of the size of an object such as large to small or of a color such as dark to light
- **Emphasis** – focal point creating the center of attention
- **Variety** - the state of being varied or diversified
- **Contrast** - strikingly unlike in comparison
- **Unity** - a whole or totality as combining all its parts into one

Principles of Universal Design

Universal design is the design of products and environments to be usable by all people without adaption or specialized design. Developed by the Center for Universal Design at North Carolina State University.

➤ The seven principles:

- **Equitable Use:** The design is useful and marketable to people with diverse abilities
 - Provide the same means of use for all users: identical whenever possible ; equivalent when not
 - Avoid segregating or stigmatizing any users
 - Provisions for privacy, security and safety should be equally available to all users
 - Make the design appealing to all users
- **Flexibility in Use:** The design accommodates a wide range of individual preferences and abilities
 - Provide choice in methods of use
 - Accommodate right- or left-handed access and use
 - Facilitate the user's accuracy and precision
 - Provide adaptability to the user's pace
- **Simple and Intuitive Use:** Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills or current concentration level
 - Eliminate unnecessary complexity
 - Be consistent with user expectations and intuition
 - Accommodate a wide range of literacy and language skills
 - Arrange information consistent with its importance
 - Provide effective prompting and feedback during and after task completion
- **Perceptible Information:** The design communicates necessary information effectively to the user, regardless of ambient conditions of the user's sensory abilities
 - Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information
 - Provide adequate contrast between essential information and the surroundings
 - Maximize "legibility" of essential information
 - Differentiate elements in ways than can be described (i.e., make it easy to give instructions or directions).
 - Provide compatibility with a variety of techniques or devices used by people with sensory limitations

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- **Tolerance for Error:** The design minimizes hazards and the adverse consequences of accidental or unintended actions
 - Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated or shielded
 - Provide warnings of hazards and errors
 - Provide fail safe features
 - Discourage unconscious action in tasks that require vigilance
- **Low Physical Effort:** The design can be used efficiently and comfortably with a minimum of fatigue
 - Allow user to maintain a neutral body position
 - Use reasonable operating forces
 - Minimize sustained physical effort
- **Size and Space for Approach and Use:** Appropriate size and space is provided for approach, reach, manipulation and use regardless of user's body size, posture or mobility
 - Provide a clear line of sight to important elements for any seating or standing user
 - Make reach to all components comfortable for any seated or standing user
 - Accommodate variations in hand and grip size
 - Provide adequate space for the use of assistive devices for personal assistance

Basic Types of Design

- **Structural Design**
 - Size and shape of design from structural materials
 - Depends upon simplicity and appropriateness of material used
- **Ornamentation or Decorative Design**
 - Ornamentation of basic design structure using color, line, texture and pattern
 - **Naturalistic**, realistic or photographic design uses the natural form of nature
 - **Stylized** design adapts nature's motifs to suit the object decorated
 - **Abstract** design objects are transformed into nonrepresentational design
 - **Geometric** design is composed of geometric motifs

Color Theory

- The effects of color
 - **Hue** is the colors name
 - **Value** is the degree of luminosity
 - Shade is created by adding black
 - Tint is created by adding white
 - Tone is formed by adding both black and white
 - **Warm colors**
 - Include red, red-orange, yellow-orange and yellow
 - Considered engaging, active, positive, cheery, cozy and stimulating
 - Primary colors support courage, passion, love, excitement, danger, martyrdom, anger, fire and strength
 - May raise the body temperature
 - Tend to advance and enclose space
 - May cause irritability in strong intensities in large spaces

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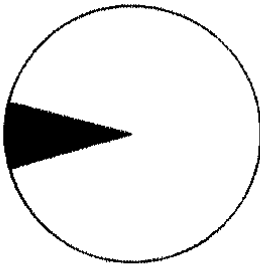
Interior Design Fundamentals

■ Cool colors

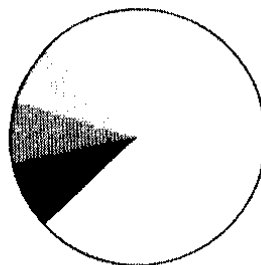
- Include blue, blue-green, green, violet and blue-violet
- Considered relaxing, restful and soothing
- Primary colors support honesty, truth, loyalty, masculinity, formality, repose, tranquility, sobriety, sky and depth of sea
- May lower body temperature
- Tend to recede and expand space
- Rooms may be cold and unfriendly and lack variety

■ Neutral and neutralized colors

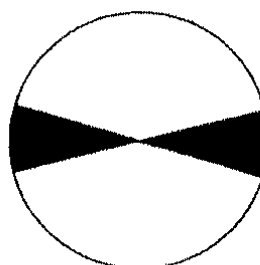
- Include achromatics of gray, white and black
- Support mourning, sorrow, depression, sophistication, mystery, magic and night
- Neutralized colors include beige, brown, taupe, cream, ivory, off-black and off-white
- Considered restful, tranquil, livable, unobtrusive and supportive
- Also can produce feelings of boredom and weariness



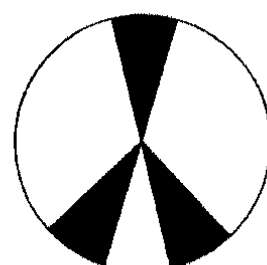
Monochromatic
(one-color plan)



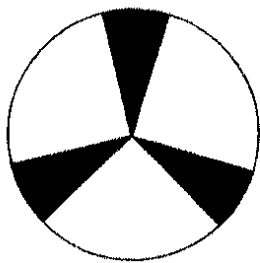
Analogous
(three- to
six-color plan)



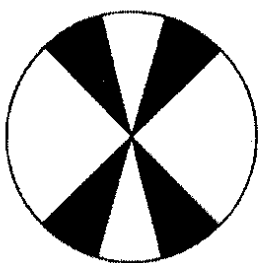
Direct
complement
(two-color plan)



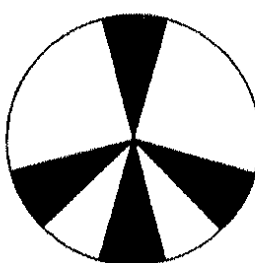
Split
complement
(three-color plan)



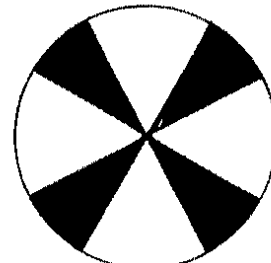
Triad
complement
(three-color plan)



Double
complement
(four-color plan)



Alternate
complement
(four-color plan)



Tetrad
(four-color plan)

➤ Color schemes

- **Achromatic** is created by utilizing black, white or variations of gray
- **Monochromatic** is developed from a single hue with differing degrees of intensity
 - Provides unity
 - Expands space
- **Analogous** is developed from any one segment of colors that are side by side but contain no more than half of the colors on the standard color wheel
 - Establishes harmony

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- **Complimentary** is developed from contrasting hues opposite on the color wheel
 - Strong chroma results in lively and vigorous
 - Grayed tone result in subtle and restful
 - Includes:
 - ◆ Direct complement
 - ◆ Split complement
 - ◆ Triad complement
 - ◆ Double complement
 - ◆ Alternative complement tetrad
 - ◆ Tetrad

Textiles

➤ **Protein fibers**

- **Wool**

- Expensive
- Excellent resilience and elasticity
- Wears well
- Cleans well and resists dirt
- Can absorb 20% of its weight in moisture without feeling damp
- Flame retardant
- Yellowes with age
- Shrinks
- Damaged by moths and other insects
- Used for upholstery, carpeting, draperies and wall coverings

- **Silk**

- Expensive
- Obtained from fibers spun by silkworm larvae
- Soft and luxurious
- Strong with good resiliency and flexibility
- Very susceptible to fading and degrades in sunlight
- Deteriorates with soil, beetles and moisture
- Used for draperies, some upholstery applications when backed, wall coverings, trim and fabric art

➤ **Cellulosic fibers**

- **Cotton**

- Relatively inexpensive
- Takes and holds colors well
- Washes easily
- Moderately good abrasion resistance
- Poor resilience and recovery properties
- Degrades in sunlight
- Subject to mildew
- Used for upholstery, floor coverings and window treatments

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- **Linen**
 - Made from flax fibers
 - Strong, pliable and lustrous
 - Takes and hold colors
 - Wrinkles readily
 - Lacks resilience and flexibility
 - Susceptible to abrasion
 - Difficult to clean
 - Used for upholstery, draperies, table lines and slip covers
- **Regenerated cellulosic fibers**
 - **Acetate**
 - Smooth and silky
 - Drapes well and holds shape
 - Strong colors
 - Flammable
 - Fair abrasion resistance
 - Poor resiliency and heat tolerance
 - Poor sunlight resistance
 - Used for curtains, drapery, upholstery, rugs and shower curtains
 - **Rayon**
 - Soft and drapes well
 - Excellent color range
 - Fair abrasion resistance
 - Poor crease retention
 - Burns quickly but does not melt
 - Used for curtains, drapery, upholstery, rugs and table linens
- **Synthetic fibers**
 - **Acrylic**
 - Wool-like and soft
 - Warm
 - Rich colors
 - Abrasion resistant
 - Good strength and resilience
 - Pilling depends upon quality
 - Resistant to sunlight
 - Resists fire and burns with yellow flame
 - Used for rugs, carpets, blankets, curtains, drapery and upholstery
 - **Nylon**
 - One of most popular synthetic fibers
 - Silky with natural luster
 - Good color range
 - Drapes well
 - Excellent abrasion resistance
 - High resiliency and elasticity
 - Resistant to flame and melts slowly
 - Resistant to chemicals, water and microorganisms
 - Used for upholstery, bedspreads and carpets

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- **Olefin**
 - Inexpensive
 - Waxy and wool-like
 - Fair color range
 - Good to excellent abrasion
 - Heat sensitive but slow to burn
 - Highly resistant to chemicals, mildew and microorganisms
 - Highly resilient and nonabsorbent
 - Used in carpets and carpet backing
 - Good light tolerance
 - Used for rugs, blankets, upholstery, webbing and seat coverings
- **Polyester**
 - Silky and wool or cotton-like
 - Good resistance to abrasion
 - Resists wrinkles
 - Burns slowly
 - Good resilience and elasticity
 - High resistance to solvents and other chemicals
 - Loses strength in prolonged sunlight
 - Tends to absorb and hold oily materials
 - Used for curtains, draperies, upholstery, carpets and rugs, pillows and blankets

Furniture Construction

➤ **Primary classifications**

- **Hardwoods**
 - From deciduous trees that drop their leaves such as oak and maple
 - More durable and dent resistant than softwood
 - Furniture manufactured from kiln-dried hardwood is usually the most dimensionally stable as a foundation for upholstered seating
- **Softwoods**
 - Come from coniferous trees with needles that are mostly green year round such as pine and spruce
 - Used for less expensive furniture and in combination with hardwoods
- **Other forms of wood**
 - **Plywood**
 - ◆ Thin layers laminated with the grain of each turned 90 degrees in odd numbered layers
 - ◆ It is commonly used in the core of veneers for furniture construction
 - **Particle board** (AKA chipboard)
 - ◆ A compressed combination of chips of wood with resin
 - ◆ More resistant to warping than plywood
 - ◆ It is commonly used as a base in veneer furniture construction

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- **Fiberboard** (AKA medium-density fiberboard)
 - ◆ Wood is broken down into fibers through a steam pressure process, mixed with resins and pressed into panels
 - ◆ Frequently used for cabinet door panels and moldings and as a base for laminated surfaces
- **Hardboard** (AKA high-density fiberboard)
 - ◆ Thinner than particle board
 - ◆ Masonite is its common trade name
 - ◆ Commonly used in the bottom of drawers, dust panels and on furniture backs
- **Bentwood**
 - ◆ Made by placing thin strips of wood under pressure and softening them with steam to fit around molds
 - ◆ i.e. Michael Thonet's bentwood chairs developed in the 1800s
- **Wheatboard**
 - ◆ Produced from surplus or waste straw
 - ◆ Stained and finished for use in custom-built cabinets, countertops and shelving
 - ◆ A "green" product which is formaldehyde free used on interior furniture framing

➤ **Finishes**

- May refer to the color only versus the species of wood used
- **Paints** – gloss, semi-gloss, eggshell and matte or flat
 - **Acrylic**
 - ◆ Water-based synthetic resin
 - ◆ Extremely durable, colorless, easily applied, quick drying and washable
 - ◆ Commonly used on exterior finishes
 - **Alkyd**
 - ◆ Resin enamel that is fast drying, resists yellowing and is easy to clean
 - ◆ Thinned with solvent
 - ◆ Recommended for moldings, woodwork, trim and moist areas
 - ◆ Best choice for painting metals
 - **Enamel**
 - ◆ Similar to oil paint
 - ◆ Made with varnish or lacquer
 - ◆ Hard and durable
 - **Epoxy**
 - ◆ Ready-mixed or two-stage catalyzed epoxy
 - ◆ Resistant to scratching, striking or marking
 - ◆ Can be used on shower stalls, basement walls and swimming pools
 - **Latex**
 - ◆ A type of acrylic frequently used on interior finishes
 - ◆ Water-based
 - ◆ No overlap marks, dries quickly and characteristic odor soon fades
 - ◆ "Breathes" allowing some moisture to escape which eliminates blistering

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- **Sealers and fillers** - applied to new surfaces as a base coat
 - **Stains**
 - ◆ Penetrates wood pores and contains various colorants
 - ◆ A varnish is generally applied over a stain for sealing
 - **Varnish** – high-gloss or matte
 - ◆ Transparent coating commonly used on wood to protect the surface and allow the natural grain to show through
 - ◆ Natural or synthetic substance that leaves a hard, glossy film
 - ◆ May have colorant added
 - **Shellac** – matte to high gloss
 - ◆ A resinous substance that dries quickly
 - ◆ Does not discolor
 - ◆ Less durable than varnish and subject to water spots
 - ◆ May be used on furniture
 - **Lacquer**
 - ◆ Natural or synthetic varnish-like finish
 - ◆ Comes in white, black, brown or beige
 - ◆ May be used on furniture
 - **Polyurethane** – matte, medium gloss or high-gloss
 - ◆ Exceptionally tough plastic surface coating
 - ◆ Most protective surface for hardwood floors in heavy traffic areas
 - ◆ Moisture resistant for walls
 - ◆ Protects furniture surfaces and wood paneling

➤ **Cabinetry**

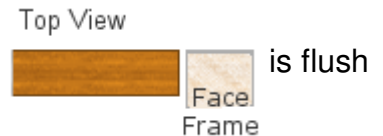
▪ **Types**

- **Framed** with inset, lipped, overlay and full overlay doors
- **Frameless** with full overlay door and concealed hinges
- **Tambour** with their own frame



▪ **Doors**

- **Inset** for framed cabinetry- sits within the face frame and with the front edges of the cabinet box

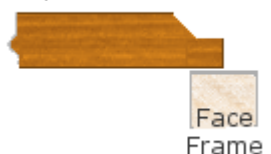


Top View



- **Lipped** for framed cabinetry - has a rabbet (groove) cut all the way around the door on the back edge

Top View



- **Traditional overlay** for framed cabinetry - is the most common type of cabinet door

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Top View

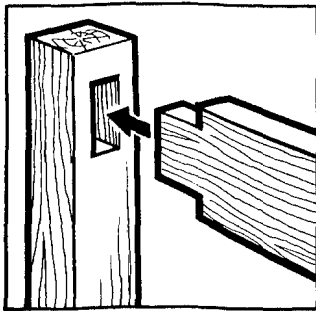


- **Full or flush overlay** for frameless cabinetry- the door and drawer fronts are mounted to completely cover the face frame

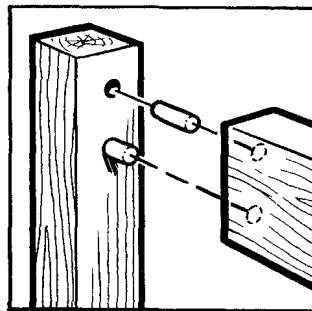
○

- **Tambour** - is made of many separate pieces that are attached to a flexible backing sheet, and installed in a track which allows it to slide around a corner or roll up much like a shade (most commonly used for appliance garage doors)

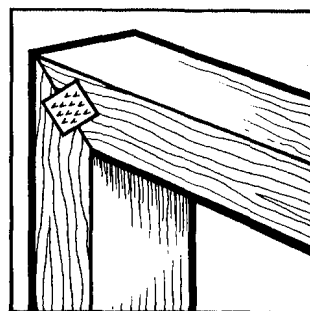
➤ Construction joining methods



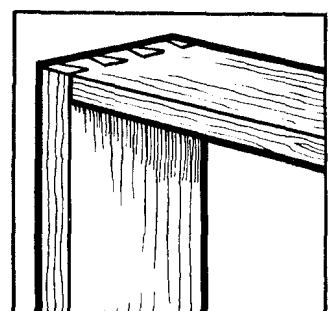
Mortise and tenon



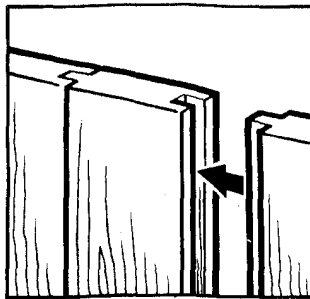
Dowel



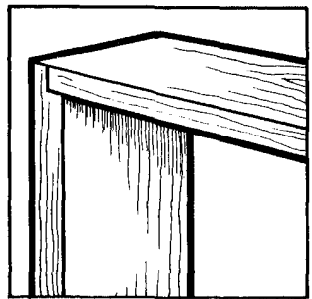
Miter



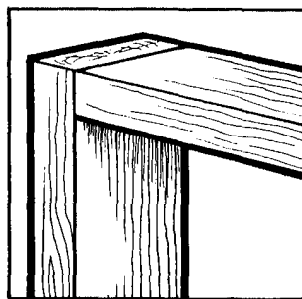
Dovetail



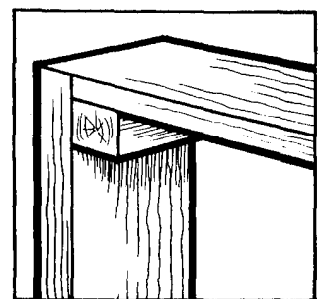
Tongue and groove



Rabbeted or rebated



Butt joint



Blocking

▪ **Mortise and tenon**

- The mortise (hole) joins with a piece that has a projected piece (tenon)
- Forms a strong joint especially where arms and legs join the frame
- Recommended for fine furniture

▪ **Dowel**

- Rounded dowels (pegs) are joined and glued into corresponding holes
- The strength relies on the strength of the dowel

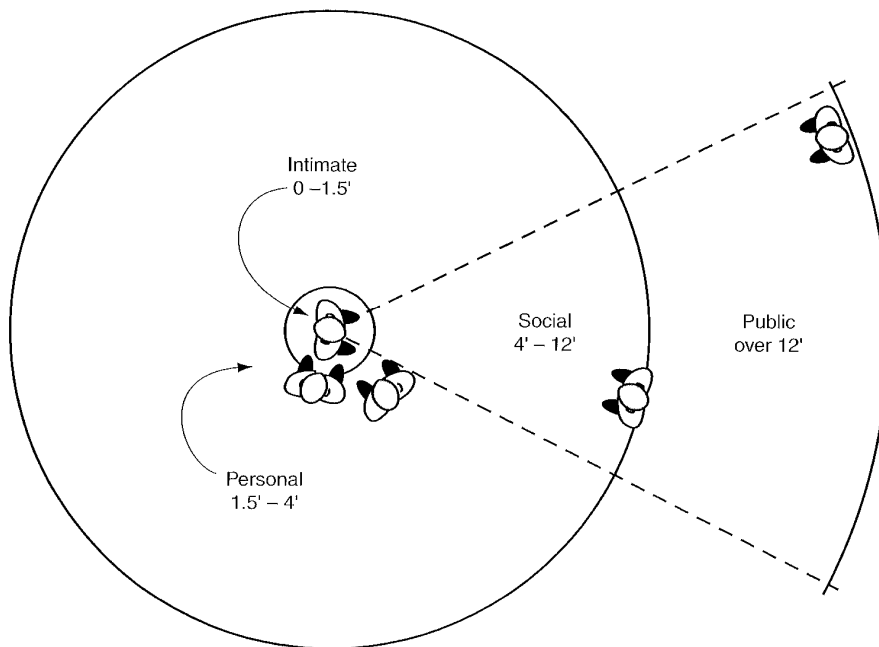
▪ **Miter**

- Edges are cut at a 45-degree angle
- Must have a supportive strip straddling the joint to be strong

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- **Dovetail**
 - Semi triangular of fan-shaped protrusions fit into notches of the same size and shape
 - This type of joint secures drawer fronts and sides
 - **Tongue and groove**
 - Similar to the mortise-and-tenon but runs the entire length of the joint
 - **Rabbeted or rebated**
 - One edge has a groove cut the entire width to accommodate a straight-edged piece
 - **Butt joint**
 - Joint are merely glued or screwed together
 - Not recommended for fine furniture
 - May be found on inexpensive furniture with cross-supports or corner blocks for reinforcement
 - **Blocking**
 - Corner blocks or hidden blocks of wood help to reinforce joints
 - May be used for table or chair legs
- **Proxemics**
- The study of a use of space by human beings in a particular culture
 - Merges cultural, physical and psychological components to create adequate space in interior environment
 - Includes bubbles for **intimate, personal, social and public** spaces



Source: **Beginnings of Interior Environments** by Lynn M. Jones and Phyllis S. Allen