



Using the Seven Principles of Universal Design for Specifying Windows and Glass Doors



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Learning Objectives

After completing this course, you should be able to:

- Describe universal design and how it differs from accessibility.
- Discuss changing demographics and who benefits from universal design.
- List the seven principles of universal design for windows and glass doors, and give examples of each.
- Explain the etiquette for working with universal design clients, economics, and certifications.



Introduction

- Difference between universal design and accessibility
- People of varied abilities who benefit from universal design
- Seven Principles of Universal Design
- Examples included



Learning Objective 1

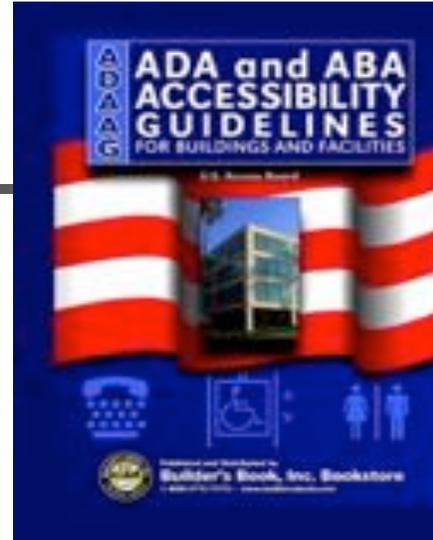
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Accessible Design

- There are many laws for accessibility in the United States and around the world:
 - Americans with Disabilities Act (ADA)
 - Fair Housing Act (FHA)
 - American National Standards Institute (ANSI)
 - Uniform Federal Accessibility Standards (UFAS)
- Their purpose is to eliminate barriers in buildings for people with disabilities.



Accessible Design

- Accessibility laws include standards that dictate the requirements for:
 - Space allowance and reach ranges
 - Door and maneuvering clearances
 - Ramps and stairs
 - Toilet rooms and grab bars
 - Controls and operating mechanisms
 - Switch and outlet heights
 - And more

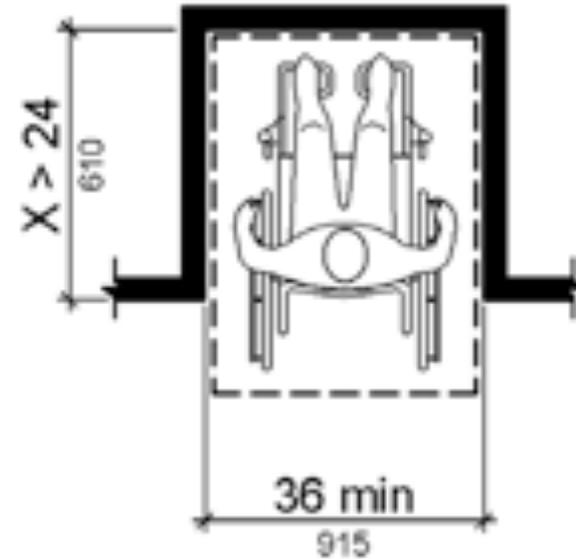


Figure 305.7.1: Maneuvering Clearance in an Alcove, Forward Approach



Universal Design

- Universal design is not a substitute for accessible design.
- Accessibility is a legal mandate, and universal design is not.
- Universal design can be incorporated into both product and architectural design.



Universal Design

- Means abandoning the concept of the “typical” or “average” user
- Components of universal design:
 - Aesthetics
 - Affordability
 - Availability



Universal Designs Are “Not Special”

“Useful products are generally available through standard distribution channels.”

—*U.S. Dept. of Housing and Urban Development (HUD)*



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What Is Universal Design?

- All spaces should be fundamentally accessible for all potential users
- Solutions that work for everyone
- From infant or child to adult, and possibly to mental and physical frailty, or even dementia
- The ultimate “cradle-to-grave” design
- Addressing the needs of every stage of human life



Who Benefits from Universal Design?

- Toddlers and children
- Frail, elderly people
- People with limited or no vision
- Those with limited or no hearing
- People who use a wheelchair
- Etc.



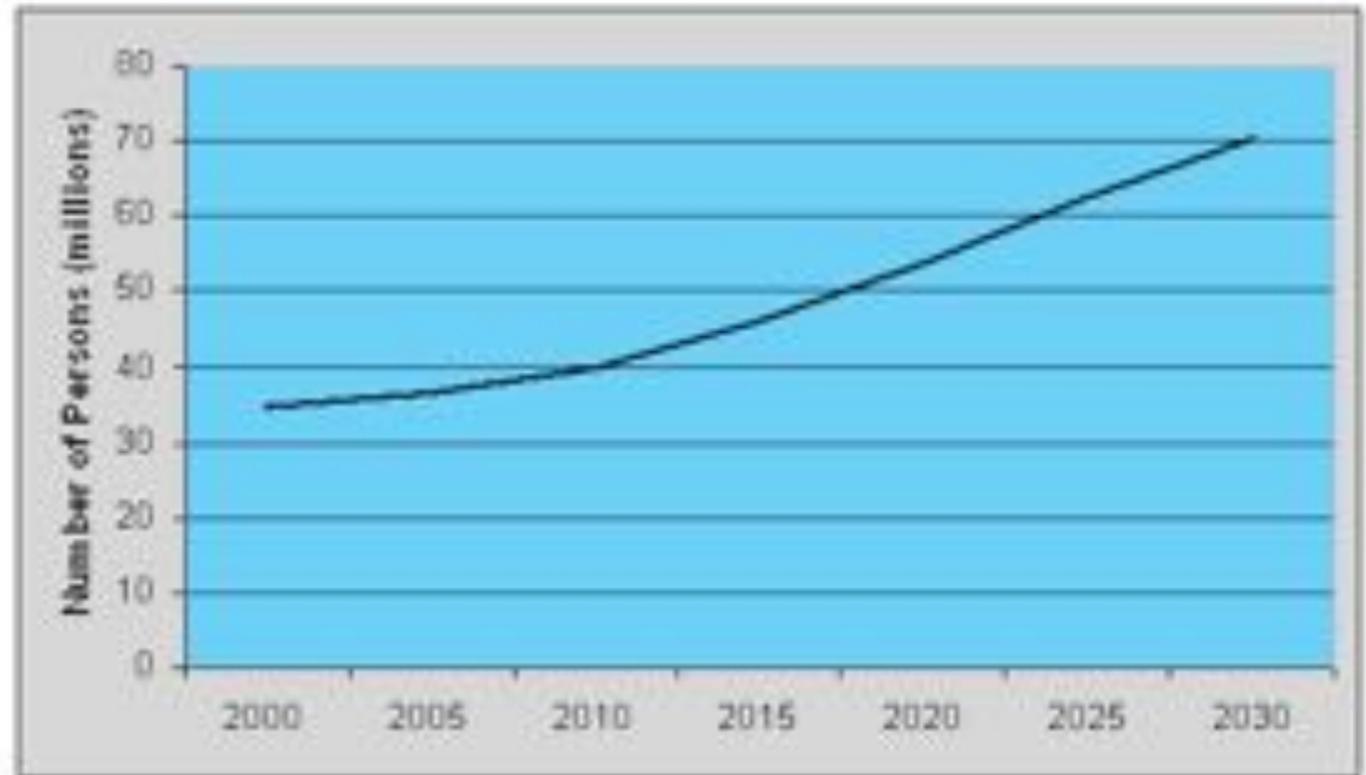
Universal Design Statistics

- 19.9 million people have trouble lifting and grasping.
- 9.4 million have difficulty with at least one activity of daily living.
- 2.4 million have Alzheimer's disease, senility, or dementia.



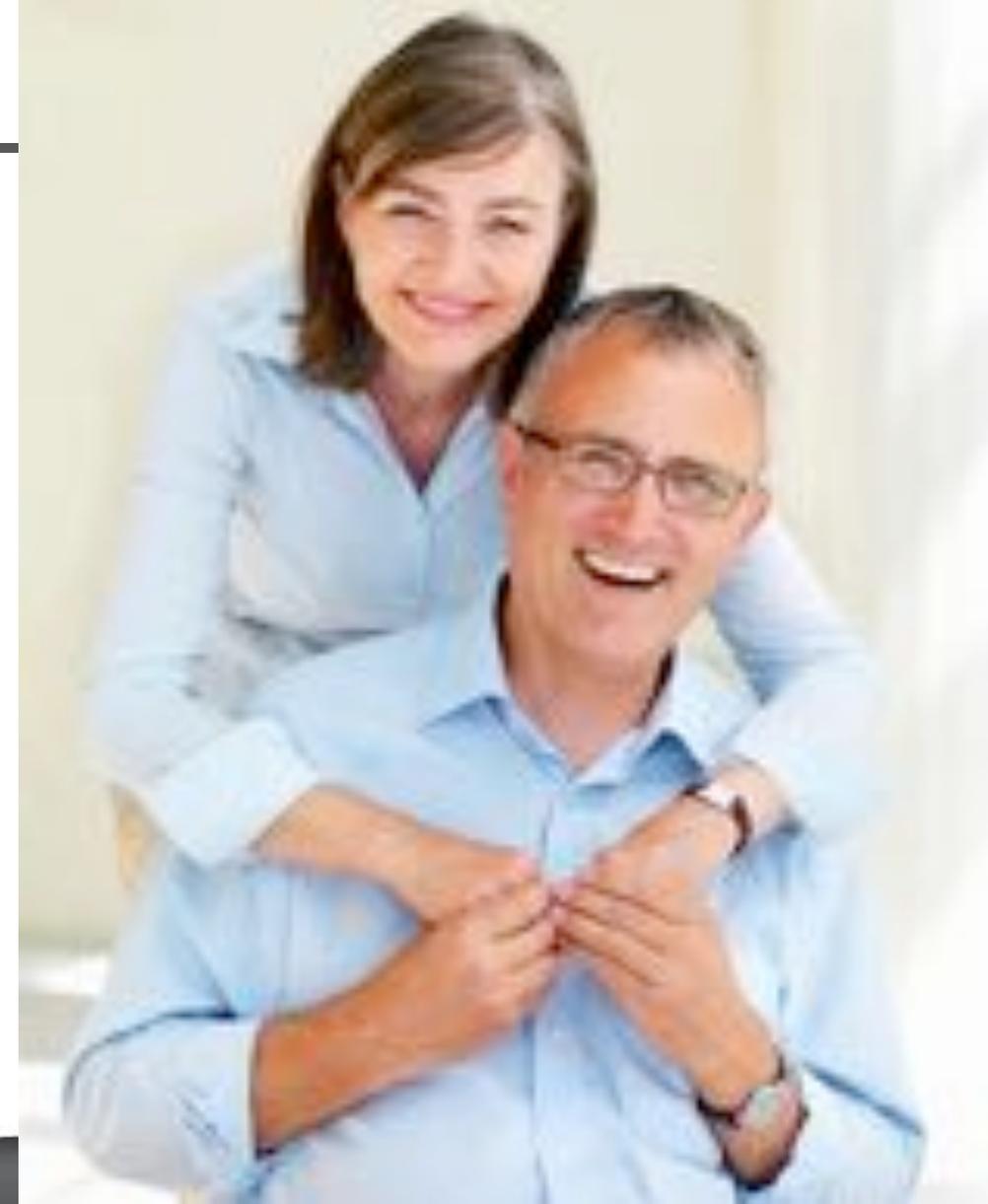
Demographic Trends Toward Older Population

- Demographic shift toward a larger population of older adults:
 - Baby Boomer generation
 - Longer life expectancy rates
 - Declining birth rates



Physical Changes of an Aging or Disabled Population

- Older people are more likely to suffer from chronic illness.
- Physical changes may cause functional limitations.
- Many homes are inaccessible to a large part of the population.



Independent Living and “Aging

- Every 8 seconds, a Baby Boomer turns 60.
- Boomers are changing and establishing attitudes and perceptions about aging.
 - Most Boomers own their homes, are married, and still have income.
 - Boomers prefer to “age in place,” or live in their own home as they grow older.



Universal Design Depends on Acceptance

- Adoption of Universal Design depends on acceptance.
- The general population needs to see the added value.
- Product manufacturers have recognized this.
- This has resulted in more attractive and functional products.



Examples of Universal Design in Society

- Curb ramps effective for:
 - Wheelchairs
 - Parents with strollers
 - Skateboards
 - Bicycles



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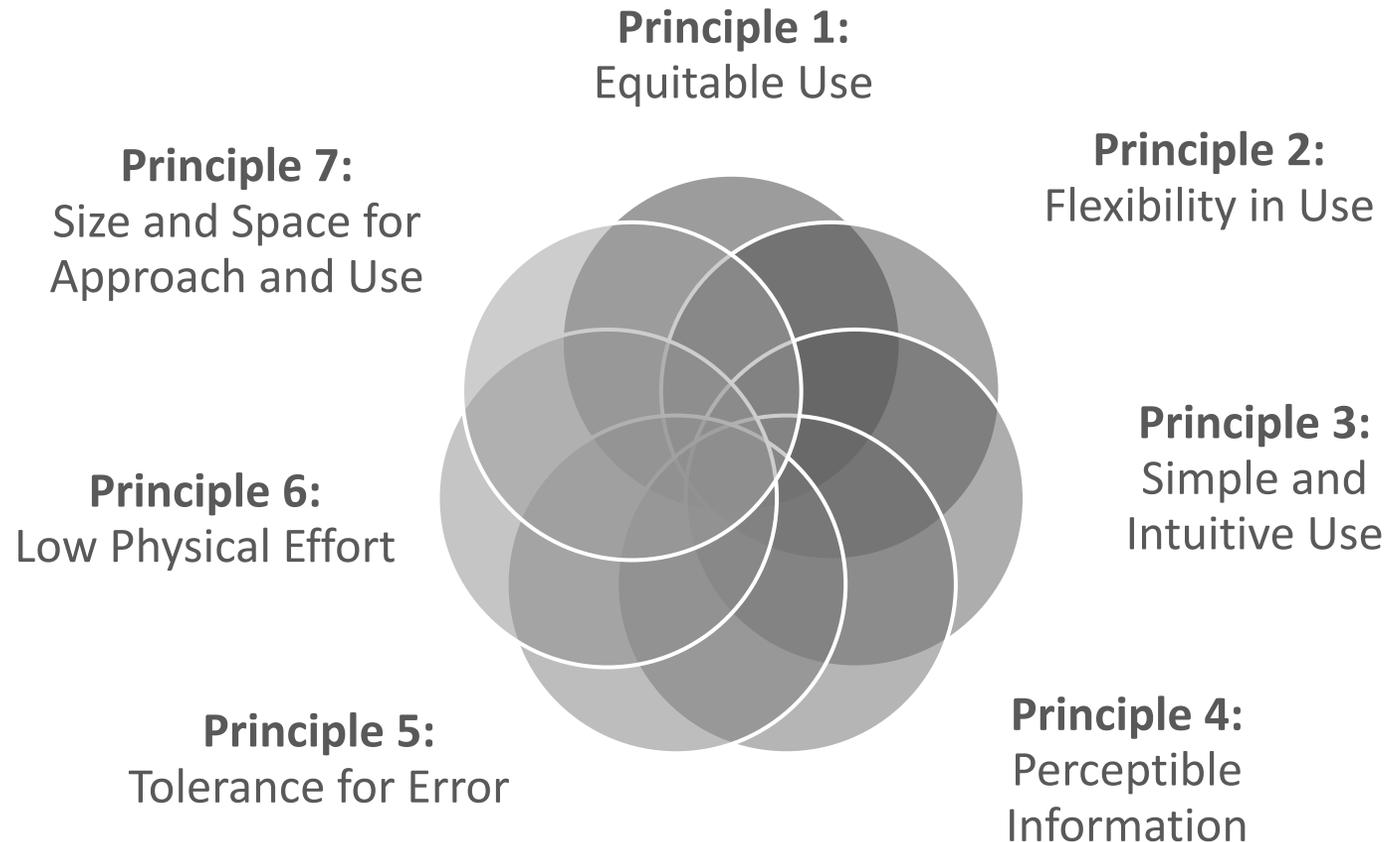
Learning Objective 3

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The Seven Principles of Universal Design



Universal Design: General Examples

- Entrance
- Bathroom sinks
- Bathroom counters
- Faucets
- Grab bars
- Kitchens storage
- Flooring
- Light switches
- A bedroom, full bathroom, and laundry room on main floor



Principle 1: Equitable Use

- Useful and marketable to people with diverse abilities
- Equally usable by everyone
- Additional options for convenience and safety



Principle 1: Equitable Use

- The same means of use for all users
- No segregating or stigmatizing users
- Privacy, security, and safety equally available
- Appealing to all users



Principle 1: Equitable Use

Example: An ergonomic door handle unlocks, opens, and closes the door with one single motion.



Principle 1: Equitable Use

Example: A lever-style handle requires no twisting or gripping for, which makes for equitable use.

Note: A lever-type handle that is easy to grasp satisfies the requirements of the ADA for accessible doors.



Principle 1: Equitable Use



Principle 1: Equitable Use



Principle 1: Equitable Use

Example: A glass front door allows a person seated in a chair and a person of short stature to see who is approaching.



Principle 2: Flexibility in Use



Principle 2: Flexibility in Use

Principle 2 guidelines:

- Choice in methods of use
- Right- or left-handed access
- Facilitate user's accuracy
- Adaptability to user's pace



Principle 2: Flexibility in Use



Principle 2: Flexibility in Use



Principle 3: Simple and Intuitive Use

Easy to understand regardless of:

- Experience
- Knowledge
- Language skills
- Concentration level



Principle 3: Simple and Intuitive Use

Principle 3 guidelines:

- Eliminate unnecessary complexity.
- Be consistent with user expectations and intuition.
- Accommodate a wide range of literacy and language skills.



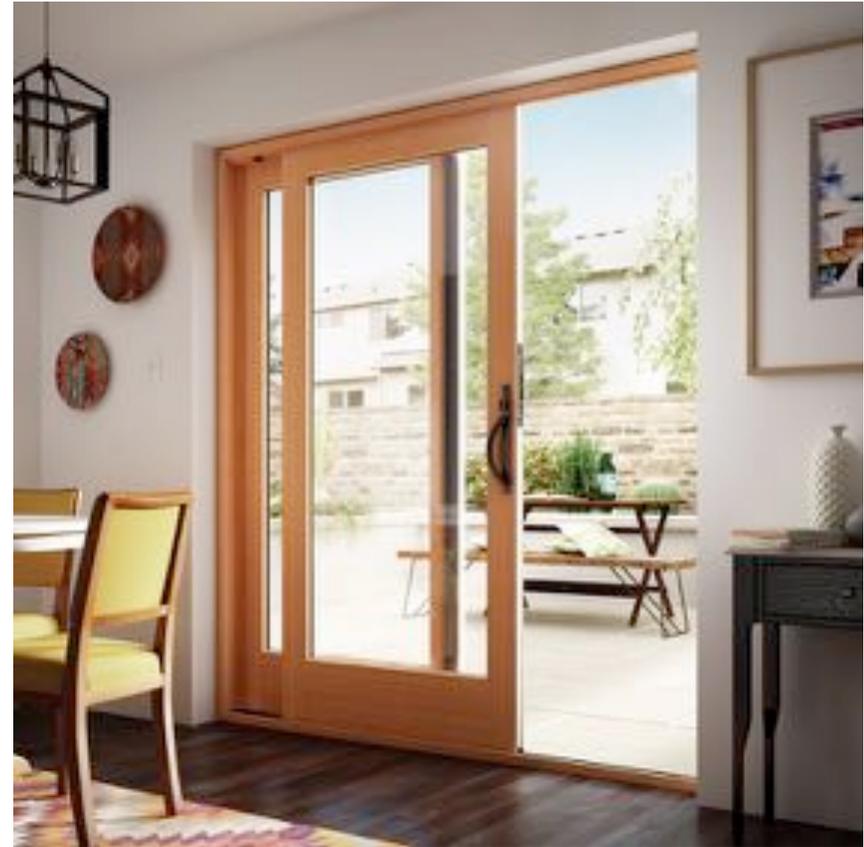
Principle 3: Simple and Intuitive Use

Example: A window lock with one-touch operation is operable using either hand with minimal force.



Principle 4: Perceptible Information

The design communicates necessary information effectively regardless of ambient conditions or the user's sensory abilities.



Principle 4: Perceptible Information

Principle 4 guidelines:

- Use different modes for redundant presentation.
- Provide adequate contrast.
- Maximize "legibility."
- Differentiate elements.
- Provide compatibility.



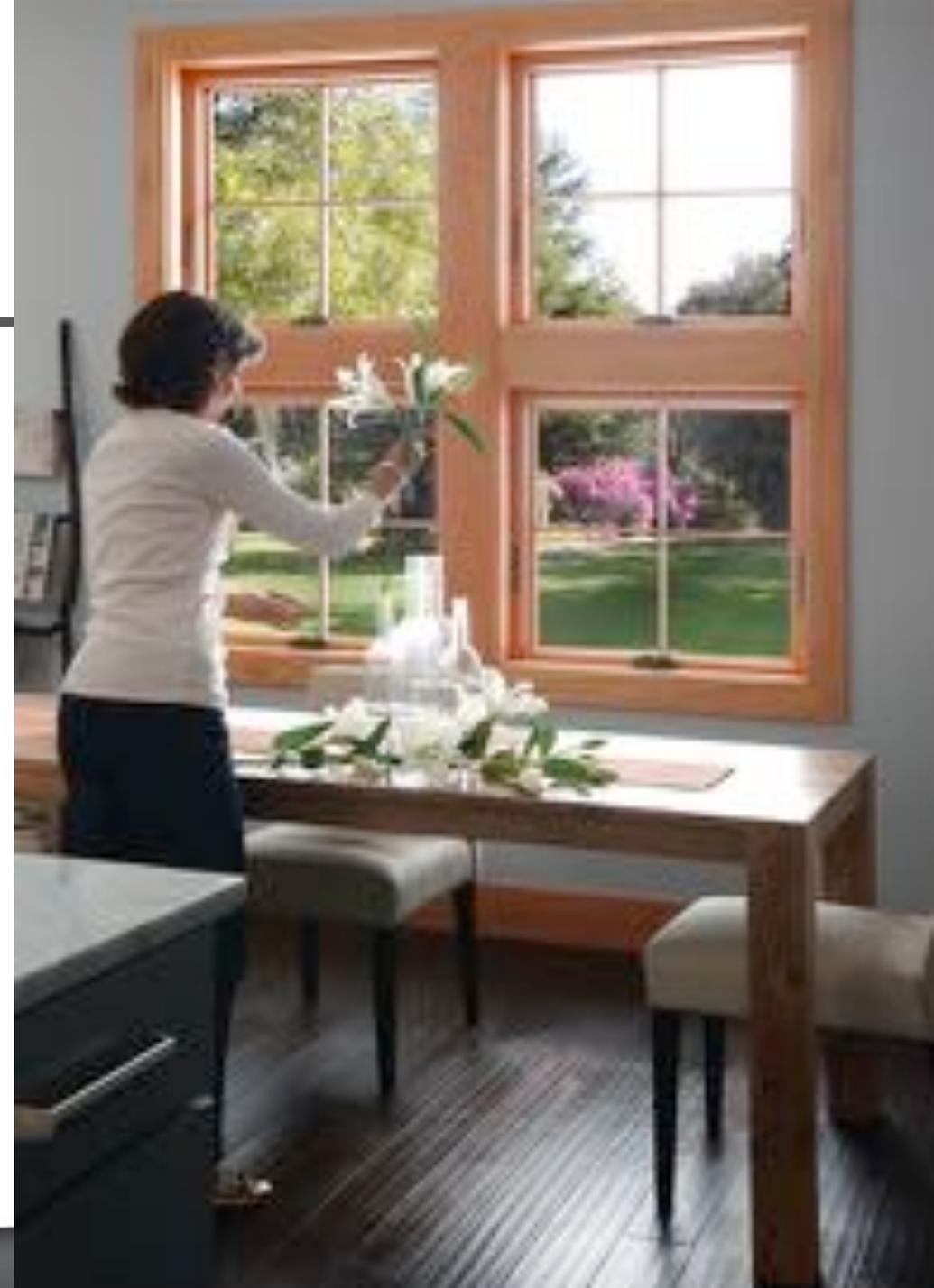
Principle 4: Perceptible Information



Principle 4: Perceptible Information

Example

- Natural light is safer for those with diminished eyesight.
- Windows can reduce the need for artificial lighting during daylight.
- South-facing windows offer maximum light.
- Obscure glass options allow for privacy.



Principle 5: Tolerance for Error

- Minimize hazards.
- Eliminate features that could be dangerous.
- Users should receive warnings.



Principle 5: Tolerance for Error

Principle 5 guidelines:

- Arrange elements to minimize hazards and errors.
- Provide warnings of hazards and errors.
- Provide fail safe features.
- Discourage unconscious action.



Principle 5: Tolerance for Error

- Eliminate any features that could be dangerous or provide inconvenience to the user.
- **Example:** windows with blinds installed between panes of glass
 - Blinds stays clean and free of debris, eliminating the need for dusting and cleaning.
 - Eliminates cords, removing a safety hazard for young children.



Principle 6: Low Physical Effort

- The design can be used efficiently and comfortably with a minimum of fatigue.
- The features require little or no force to use.



Principle 6: Low Physical Effort

Principle 6 guidelines:

- Allow user to maintain neutral body position.
- Use reasonable operating force.
- Minimize repetitive actions.
- Minimize sustained physical effort.



Principle 6: Low Physical Effort

Example: horizontal sliding windows

- High-impact nylon rollers glide across raised monorail track.
- This makes it easy to open and close the window.



Principle 6: Low Physical Effort

Example: sliding glass doors

- High-quality rolling systems make it easier to open and close doors.



Principle 7: Size and Space for Approach and Use

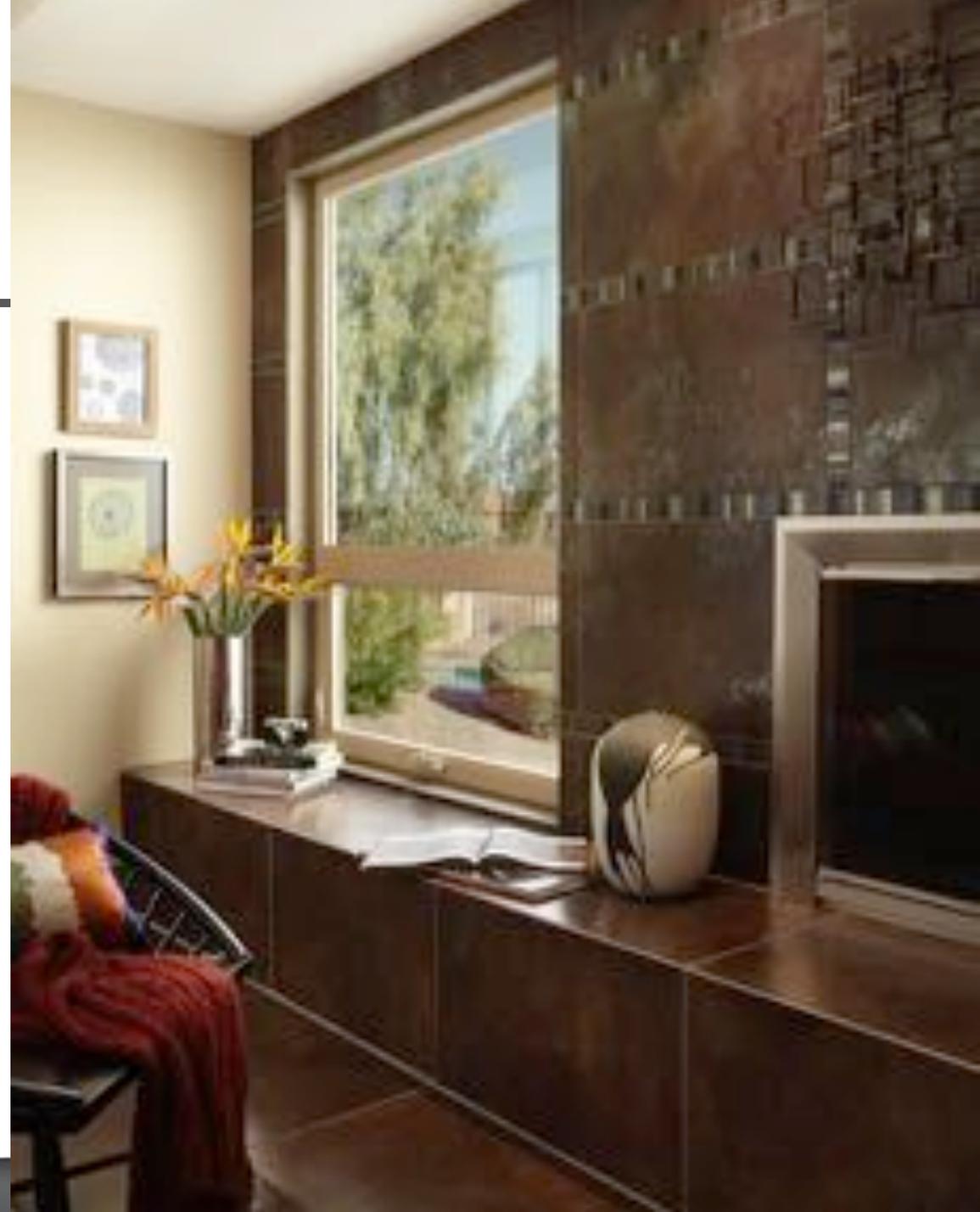
- Appropriate size and space for:
 - Approach
 - Reach
 - Manipulation
 - Use
- Regardless of user's:
 - Body size
 - Posture
 - Mobility



Principle 7: Size and Space for Approach and Use

Principle 7 guidelines:

- Provide a clear line of sight for any seated 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 use of assistive devices or personal assistance.



Principle 7: Size and Space for Approach and Use

Example: sliding French-style patio door

- Saves interior space
- Eliminates potential conflict with an in-swing or out-swing door



Principle 7: Size and Space for Approach and Use

Example: Windows with a lowered sill height are usable and enjoyable from both a standing and seated position.



Other Considerations

Designers must also incorporate other considerations, such as:

- Economic
- Engineering
- Cultural
- Gender
- Environmental



Learning Objective 4

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Disability Etiquette: Meeting with Clients

The United Spinal Association offers “Tips on Interacting With People With Disabilities,” including:

- Speak directly to a person with a disability.
- Do not make assumptions.
- Say “person with a disability” rather than “disabled person.”
- Do not push or touch a person’s wheelchair or mobility device.



Universal Design and Economics

- More business opportunities for:
 - Designers
 - Contractors
 - Manufacturers
- Economic benefits for homeowners:
 - Ability to stay in home rather than a care facility
 - Helps avoid fall or other injury
 - Easier for families to provide care



Universal Design Adds Value to Homes

- Trouble living independently may force some seniors from their homes.
- Homes with universal design could be in high demand.



Certifications for Universal Design

Universal Design Certified Professional (UDCP) Program

- The fundamentals of universal design
- How to conduct a client needs assessment
- Specific universal design applications
- Construction techniques
- Plumbing and electrical applications
- Differences between building codes and ADA



Other Home Modifications for Universal Design

- Master bedroom, full bathroom, kitchen, and laundry on first floor
- Door and window knobs modified
- Door frames widened
- Slip-resistant surfaces
- Cabinets lowered
- Electrical outlets raised



Learning Objectives Review

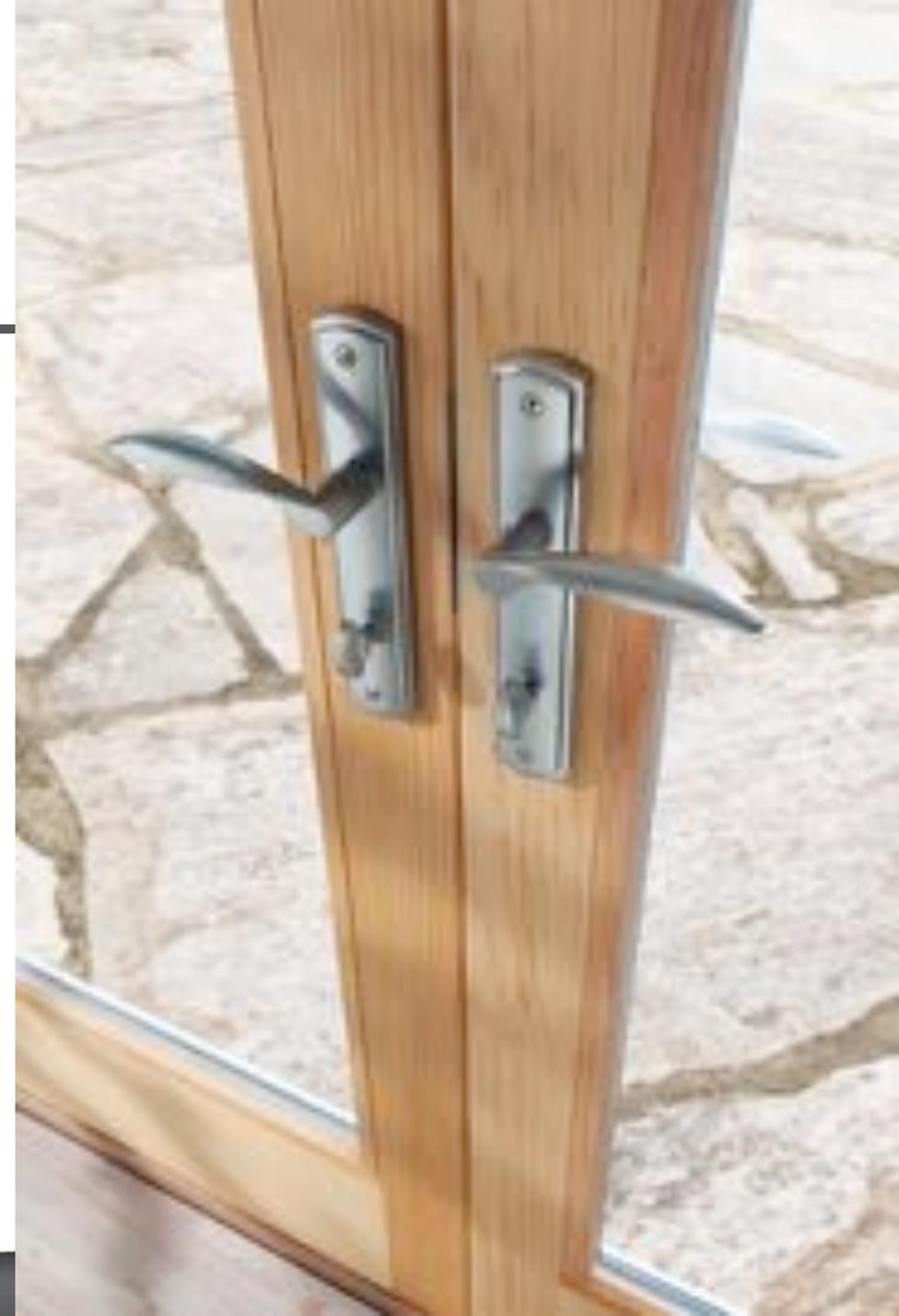
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Conclusion

- Universal design principles seek to make all environments equally usable.
- Universal design is not the same as accessible design.
- The Seven Principles of Universal Design guide designers when specifying windows and glass doors.
- This helps ensure equal use.
- The result: A safe, comfortable, and useable living environment.



Thank You

This concludes the educational unit.
Thank you for your time.



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