



# Universal Design

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Sources:

- National Institute on Disability and Rehabilitation Research, U.S. Department of Education
- The Center for Universal Design, North Carolina State University College for Design
- Center for Inclusive Design & Environmental Access, State University of New York at Buffalo
- Iowa & Kansas State Universities
- Personal & Professional Experience



## What Is Universal Design?

- Philosophy
- History
  - Residential Applications

# Philosophy

- An approach to design that incorporates products as well as building features and elements which, to the greatest extent possible, can be used by everyone.
  - **universal building feature** = any component of a house that can be used by everyone regardless of their level of ability or disability.
  - **universal elements** = standard building products or features that have been placed differently, selected carefully, or omitted.

# Philosophy

- Is the development of spaces and environments to be usable, to the greatest extent possible, by all people without the need for adaptation or specialized design.
  - People in a noisy shopping mall who cannot hear a kiosk;
  - People who are driving their car who must operate their radio or phone without looking at it;
  - People who left their glasses at home or in their car;
  - People who are getting older;
  - People with disabilities;
  - Virtually anyone!

# History

- Changing Demographics
  - Federal Legislation
  - Rehabilitation Engineering and Assistive Technologies
  - Changing Economics
    - “Barrier Free” → “Universal Design”

# Seven Principles of U.D.

1. Equitable Use
2. Flexibility in Use
3. Simple and Intuitive Use
4. Perceptible Information
5. Tolerance for Error
6. Low Physical Effort
7. Size and Space for Approach and Use

The Center for Universal Design (1997). The Principles of Universal Design, Version 2.0, Raleigh, NC, North Carolina State University.  
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## Principle #1

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.
  - Make the design appealing to all users
  - Avoid segregating or stigmatizing any users.
  - Provisions for privacy, security, and safety should be equally available to all users.



## Principle #2

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.



## Principle #3

*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.
- Arrange information consistent with its Importance.
- Provide effective prompting and feedback during and after task completion.



## Principle #4

*Perceptible Information:* The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

- Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Provide adequate contrast between essential information and its surroundings.
- Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).



## Principle #5

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 fail safe features.
  - Provide warnings of hazards and errors.
  - Discourage unconscious action in tasks that requires vigilance.



## Principle #6

Low Physical Effort: The design can be used efficiently and comfortably and with a minimum of fatigue.

- Allow user to maintain a neutral body position.
- Use reasonable operating forces.
  - Minimize sustained physical effort.



## Principle #7

### 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 seated or standing user.
- Make reach to all components comfortable for any seated or standing user.
- Provide adequate space for the use of assistive devices or personal assistance.



## Residential Applications

### ■ Entrance

- One (minimum) entrance with no steps
- Protection from rain, snow, ice, etc.
- Low door threshold (not more than ½")
- Clear opening of 32" (minimum)
- Secure door lock accessible from seated position



## Residential Applications

### ■ Kitchen

- Single lever faucet at sink and mounted on the side
- "D" shaped cabinet and drawer pulls
- Pull out shelves where possible
- Lower hung wall cabinets
- Wall ovens placed at an appropriate height



## Residential Applications

### ■ Bathroom

- Located near a bedroom if not accessible from a bedroom
- 32" clear opening (minimum)
- 60" diameter for turning area
- Lever style faucets in lieu of knobs
- Sinks or vanities to have open knee space
- Hose-type detachable, handheld shower heads



## Residential Applications

### ■ Bedroom

- Telephone and light switch within easy reach of the bed
- Some closet rods should be adjustable or mounted 48" above the floor.
- An uninterrupted path from the bed to the bathroom, free from throw rugs, cords and other obstacles.
- Night lights in paths of egress



## Residential Applications

### ■ Laundry/Utility

- Laundry facilities located on the main floor or the same floor as the bedrooms
- Front loading washer and dryer. These can be mounted on risers for easier access to someone standing
- A table or counter near the washer and dryer 28"-30" high



## Residential Applications

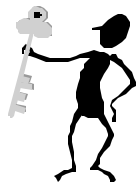
### ■ Stairs

- Sturdy, uninterrupted handrails not more than 36" above the floor. Rails should extend beyond the bottom tread 12" and beyond the top tread 24" if feasible.
- Light switches located at both top and bottom of the well.
- Rounded nosing on treads and sloped risers. Riser height should not exceed 7" or be less than 6".



## In a Nutshell...

- Universal Design challenges traditional design methods and techniques in an effort to benefit the majority of the population at large without needing specialization of products or elements and without requiring special knowledge or skills to use or otherwise function in the built environment.



## The Key to Success in Your Project?

Hire a design professional with:

1. Familiarity with the philosophy of Universal Design;
2. Understanding of accessible design issues;
3. Experience in accessible design;
4. A willingness to LISTEN to your concerns and ideas;
5. An eagerness to work on and implement your ideas where appropriate or feasible.

## Additional Information

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