

# Principles of Universal Design

## Definition

Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

—Ron Mace

The intent of universal design is to simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost. Universal design benefits people of all ages and abilities.

## Principles

### PRINCIPLE ONE: Equitable Use

The design is useful and marketable to people with diverse abilities.

Guidelines:

- 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.

### PRINCIPLE TWO: Flexibility in Use

The design accommodates a wide range of individual preferences and abilities.

Guidelines:

- 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 THREE: 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.

Guidelines:

- 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.

#### PRINCIPLE FOUR: Perceptible Information

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

Guidelines:

- Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Provide adequate contrast between essential information and its surroundings.
- Maximize "legibility" of essential information.
- Differentiate elements in ways that 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.

#### PRINCIPLE FIVE: Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

Guidelines:

- 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.

#### PRINCIPLE SIX: Low Physical Effort

The design can be used efficiently and comfortably and with a minimum of fatigue.

Guidelines:

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

#### PRINCIPLE SEVEN: 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.

Guidelines:

- 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.
- Accommodate variations in hand and grip size.
- Provide adequate space for the use of assistive devices or personal assistance.

Copyright © 1997 NC State University, The Center for Universal Design.

The Center for Universal Design (1997). The Principles of Universal Design, Version 2.0.

Raleigh, NC: North Carolina State University.

Compiled by advocates of universal design, listed in alphabetical order: Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick, Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story, & Gregg Vanderheiden