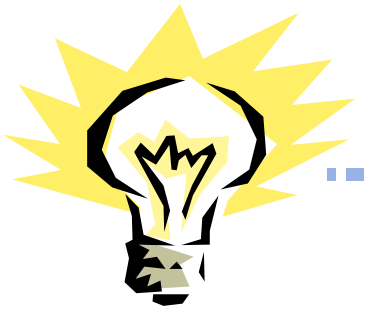


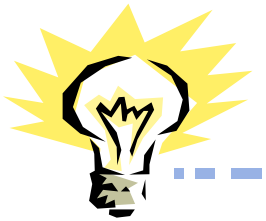
Universal Design

Diversity and Design

Applications to your project

Universal Design

- The design of all products and environments to be usable by all people to the greatest extent possible without the need for adaptation or specialized design *(Mace, 1990)*
  - Supports all types and levels of ability
  - Implies that environmental demands on all abilities will be minimized



Note!

Accessible Design: Reduce environmental demands on individuals with disability through specialized design

Universal Design: Reduce environmental demands on individuals with all levels of ability through better design overall

Principles of Universal Design

- 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

"Accepted" Principles of UD -- Center for Universal Design NCSU, 1997 **Principles of Universal Design**

Will You Use Principles of UD?

- 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

Do you have a "special" population?

Does it matter?

How can you find out about exceptions?

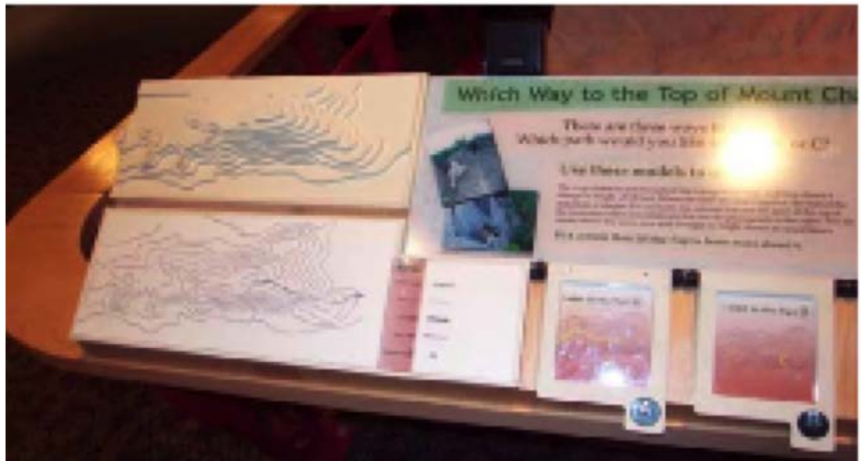
How can you make your design universal?

1. Equitable Use

- Used in same/equivalent manner
  - Avoids segregating any users

2. Flexibility in Use

- Provides choice in methods of use
- Permits right- or left- handed use
- Requires min accuracy & precision
- Adaptable to user's pace

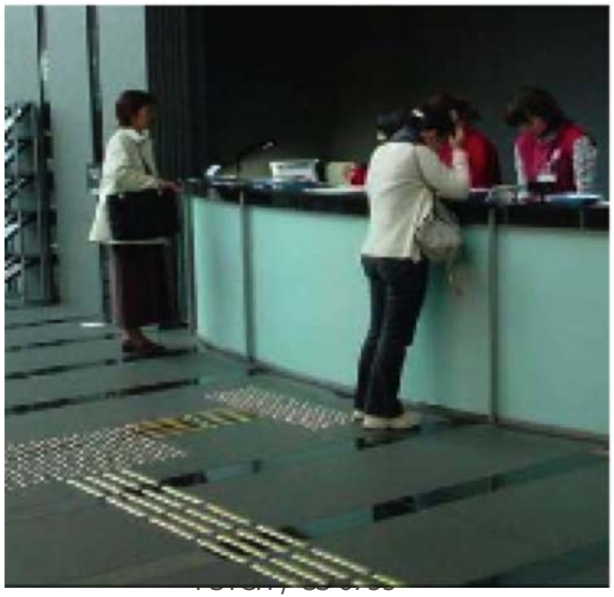


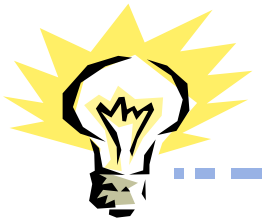
3. Simple and Intuitive Use

- Eliminate complexity
- Consistent with expectations
- Accommodate range of literacy/language
- Arrange information consistent with importance
- Prompting and feedback during task and after

4. Perceptible Information

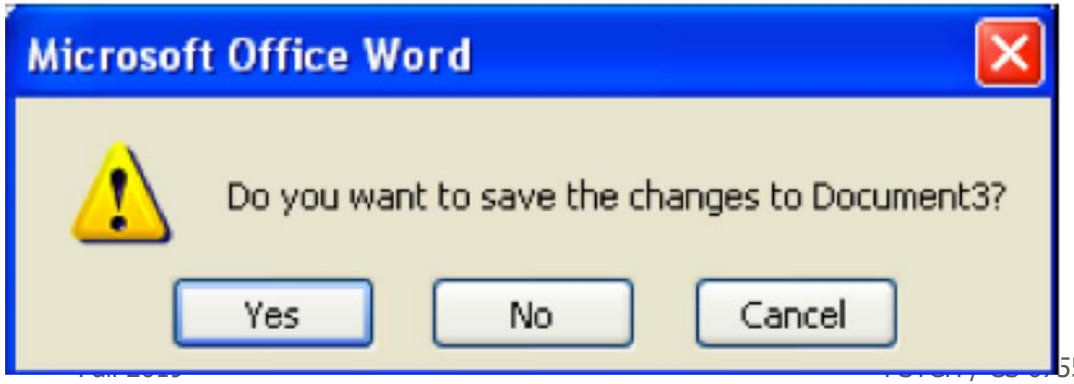
- Is multi-modal for redundant information
- Maximizes legibility of essential information
- Differentiates elements





5. Tolerance for Error

- Arranges elements to minimize hazards and errors
- Provides warnings of hazards/errors
- Provides fail safe features
- Discourages unconscious actions

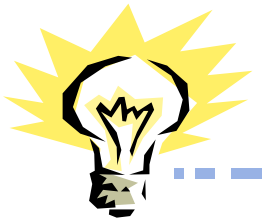


6. Low Physical Effort

- Is used in neutral body position
- Has reasonable operating forces
- Minimizes repetitive actions
- Minimizes sustained effort

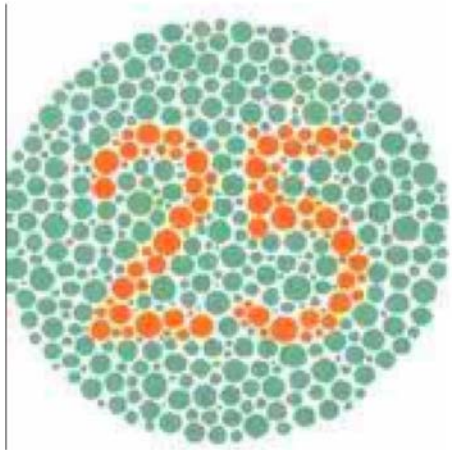
7. Size & Space for Approach & Use

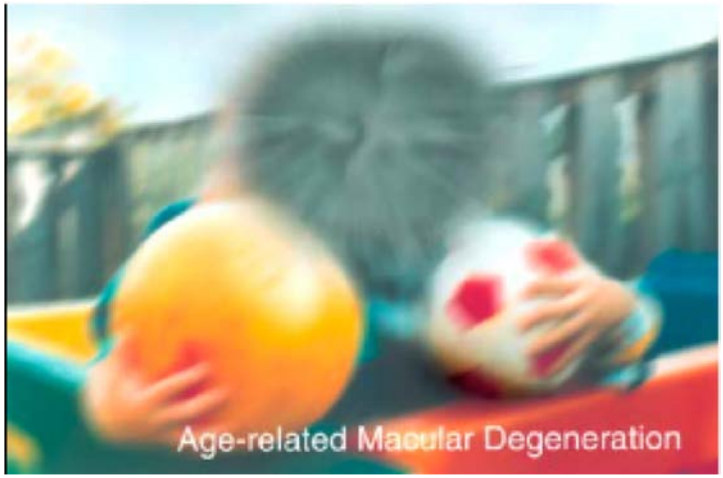
- Provides clear line of sight to important elements
- Has reachable components
- Accommodates variations in grip
- Has adequate space for AT or caregiver

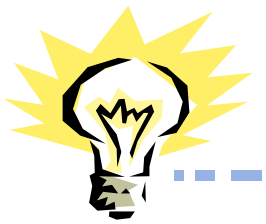


Learn About (Dis)abilities

- What are your users capable of?
- Vision loss
- Hearing loss
- Mobility impairment
- Tactile sensory loss
- Cognitive/memory impairment
- Affect management
- Etc.



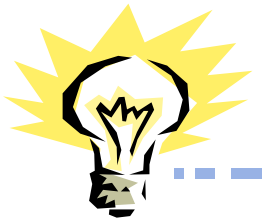




Definitions

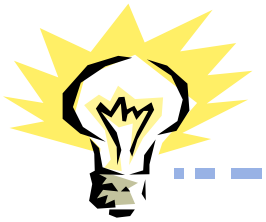
- Impairment
- Disability
- Accommodations

- Examples?



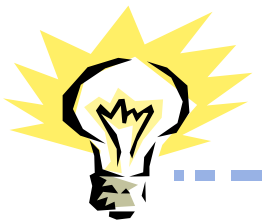
What Can You Do?

- **How can you apply UD principles to your design process? Applying UD principles means**
  - Consider more than just the problem facing you.
  - Learn about the different abilities people have
  - Strive to make your designs inclusive
  - Take time to make the product aesthetically appealing



Assistive Technology

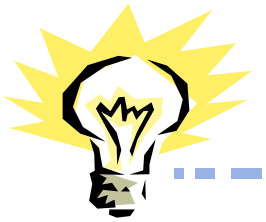
- Restore function
- Replace function
- Amplify/minimize
- Moderate
- Translate



UCD and Special Populations

- Recall all 9 UCD steps…and ask how they need to be re-considered

- Samples
- Recruiting
- Needs
- Participatory Design?
- Costs?



Upcoming

- Needs & Task Analysis
- Requirements Definition
- Evaluation *without* users
  - Predictive evaluation
    - Heuristic evaluation…
  - Interpretive evaluation
    - Ethnography…
- User modeling