

# Announcement: Quiz #1

## Quiz # 1

- Tuesday, Sep. 5 in class
- Via Blackboard – **Bring your laptop to class!**
- Open book and open notes

# Team Assignment Update

~4-5 students (U/G) in one team

## Case 1:

- Assigned team members based on background and interests
- Each team may consist of people with different skills

## Case 2: self-nominations

- Form your own team
- Send me an email by 11:59pm, Sunday, Sep. 3
  - a list of team members
  - copy to all team members

# Today's Agenda

- Design principles

# Review: Goals of HCI

- **Usability goals**

1. Easy to use (effectiveness)
2. Efficient to use (efficiency)
3. Safe to use (safety)
4. Having good utility (utility)
5. Easy to learn (learnability)
6. Easy to remember how to use (memorability)

- **User experience goals (UX goals)**

- Increasing positive/desirable emotional and felt experience
- Decreasing negative/undesirable emotional and felt experience

# Review: Interactive Design Process

## **Four basic activities:**

- Establish requirements
- Design alternatives
- Make prototype
- Evaluate

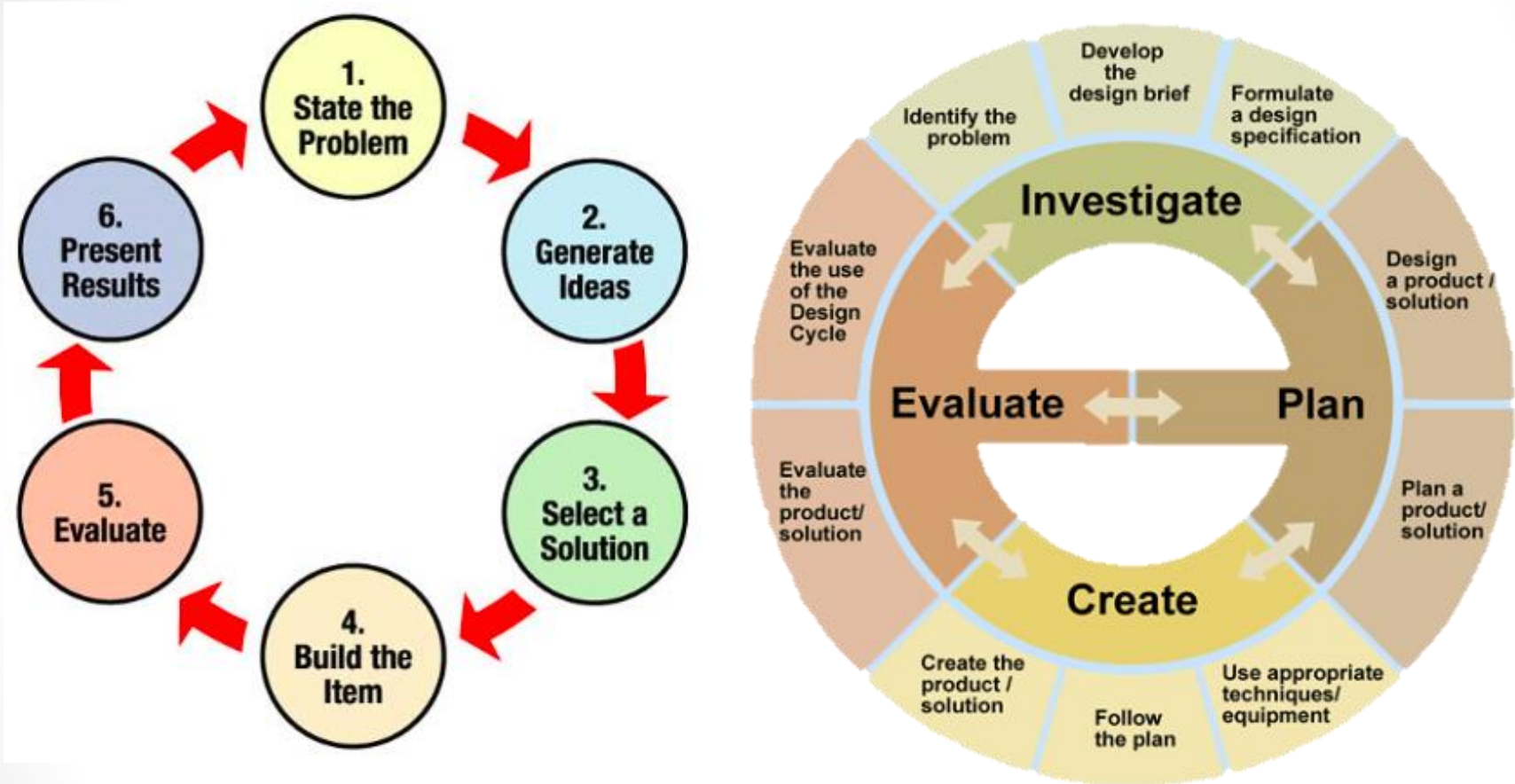
**The process is executed iteratively**

# Review: System design process

## Characteristics of the process

- Work from general to specific
- Design options have to satisfy system requirements
- Constraints (time & money)
- Iteration

# Review: Process Cycle



The details of these different design cycle examples are less important than the idea that design is **ITERATIVE!**

# Case Study

Suppose you are designing an online learning system.

What would be the design process?

First step?



# HCI Design Principles

# Recall: What is HCI?

HCI is concerned with the design, evaluation, and implementation of interactive computing systems for human use.

# Recall: What is an interface?

## **Human-made artifact**

Act as a medium between information in a system and the operator

- Tell the operator what the system is doing
- Tell the operator what needs to be done
- Tell the operator how the system functions
- Alert the operator if there is something wrong

# What is an Interface?

The collage consists of four distinct images:

- Top Left:** A computer monitor displaying a website with a navigation menu.
- Top Center:** The top portion of a 2008 U.S. Individual Income Tax Return (Form 1040A).
- Center:** A close-up photograph of a car roof with several dark, oval-shaped roof vents.
- Right:** A science project display board with a blue border, featuring a graph and a section titled 'CONCLUSION'.

**Form 1040A (2008) Details:**

Department of the Treasury—Internal Revenue Service  
**U.S. Individual Income Tax Return** 2008  
 Do not write or staple in this space.  
 ME No. 1545-0074  
 GI security number  
 social security number

gross income	17	IRA deduction (see page 29).	17
	18	Student loan interest deduction (see page 31).	18
	19	Tuition and fees deduction. Attach Form 8917.	19
	20	Add lines 16 through 19. These are your <b>total adjustments</b> .	20
	21	Subtract line 20 from line 15. This is your <b>adjusted gross income</b> .	21

For Disclosure, Privacy Act, and Paperwork Reduction Act Notice, see page 78. Cat. No. 11327A Form 1040A (2008)

# This class will...

- Make you see everyday things in a new light
- A “critical eye” for design

# Designing with User in Mind...

For the designer to keep usability in mind, there are several design principles to follow....

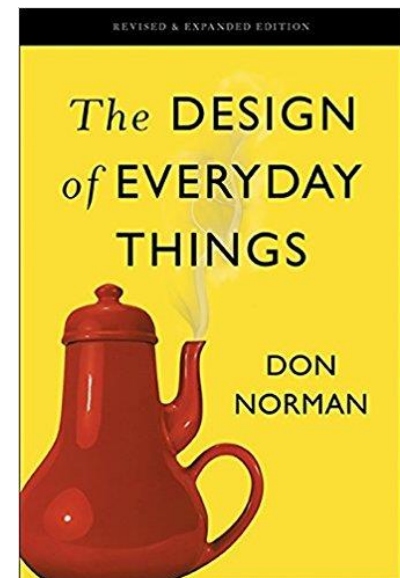
# Don Norman's Six Design Principles (ID Ch. 1)

1. Visibility – Can I see it?
2. Feedback – What is it doing now?
3. Affordance – How do I use it?
4. Mapping – What is the relationship between things?
5. Constraint – Why can't I do that?
6. Consistency – I think I have seen this before?

# Don Norman

- Cognitive scientist, computer scientist, psychologist, designer, and engineer
- Was a university professor at UCSD and Northwestern Univ.
- A co-founder of Nielsen Norman Group
- Previously with Apple, HP, etc.
- “Design of Everyday Things”

<https://www.jnd.org/about.html>





# 1. Visibility

- When capabilities are visible, it does not require memory of how to use



- Can see states of devices and possible actions
- Buttons/knobs are organized to be found and used easily

# 1. Visibility



Can you figure out how to use it?

Are two functions clear and independent?

# 1. Visibility

- When functionality is hidden, problems in use occur
  - Occurs when the number of functions is greater than the number of controls



Can you figure out how to use it?

Are two functions clear and independent?

# 1. Visibility

Visible knobs, dials and buttons have been replaced by sensor-based invisible controllers technologies

- Examples:
  - Zoom- in/out functionality of touchscreen
  - Motion-based light switches
  - Gesture-based gaming
- What are their potential issues?



# 1. Visibility

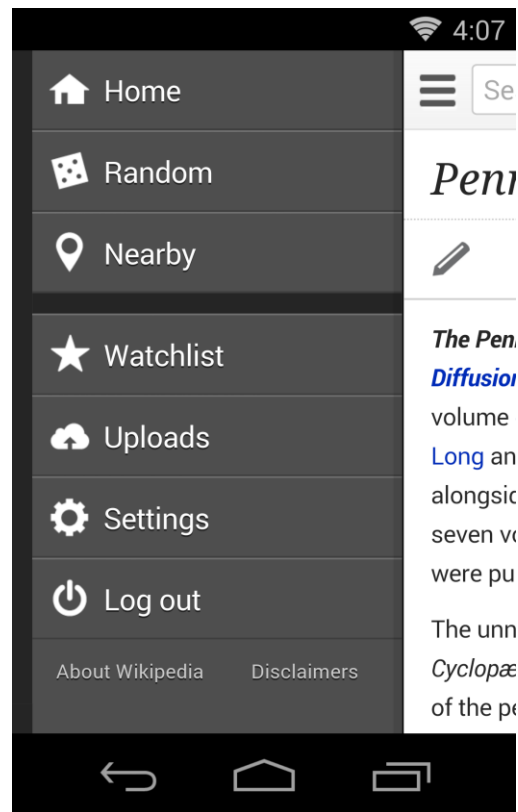
Do we have to show everything?

Problem: Cluttered interface if showing everything

- Hiding some functions can be advantageous in interface design
- Some functions are kept invisible until needed
- A structure that groups similar types is helpful
- An extreme example – Google search

# 1. Visibility

## Hamburger menu vs Tab bar in navigation



[https://commons.wikimedia.org/wiki/File:Editing\\_Wikipedia\\_mobile\\_screenshot\\_p\\_16,\\_Penn\\_y\\_Cyclopaedia\\_with\\_menu.png](https://commons.wikimedia.org/wiki/File:Editing_Wikipedia_mobile_screenshot_p_16,_Penn_y_Cyclopaedia_with_menu.png)

# 2. Feedback

Let someone know what just occurred

- Can be a sound that is made
  - E.g., keyboard and mouse clicks, earcons
- Can be change in physical state
  - E.g., changes in display, color, light
- What are desirable features of feedback?
  - Salient, prompt, user-friendly...

# 2. Feedback





## 2. Feedback

Other examples of feedback?

- Progress bars
- Error messages
- Confirmation page
- And more

# 3. Affordance

Affordance  $\neq$  if the product is affordable

- Perceived and actual properties of an object that give clues to its operation



Chair is for sitting  
Ball is for throwing  
Button is for pushing

# 3. Affordance

- Perceived and actual properties of an object that give clues to its operation



Complex things may need explanation but simple things should not

If a simple thing requires instructions, it is likely a failed design

# 3. Affordance

- Other examples of affordances in everyday interactions?



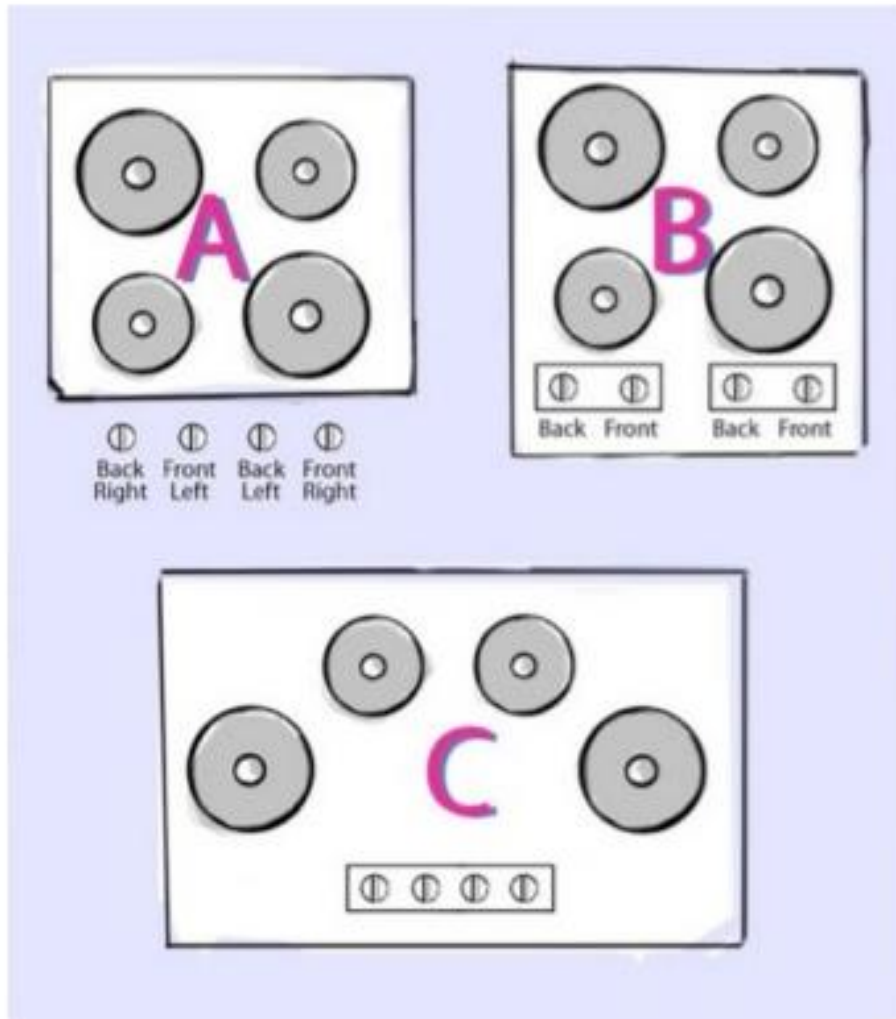
# 4. Mapping

- Relationship to controls and their effect



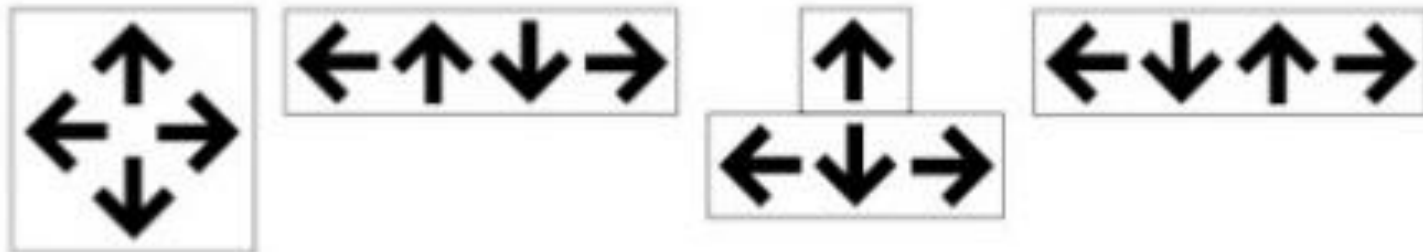
# 4. Mapping

Relationship to controls and their effect



# 4. Mapping

Relationship to controls and their effect



# 5. Constraints

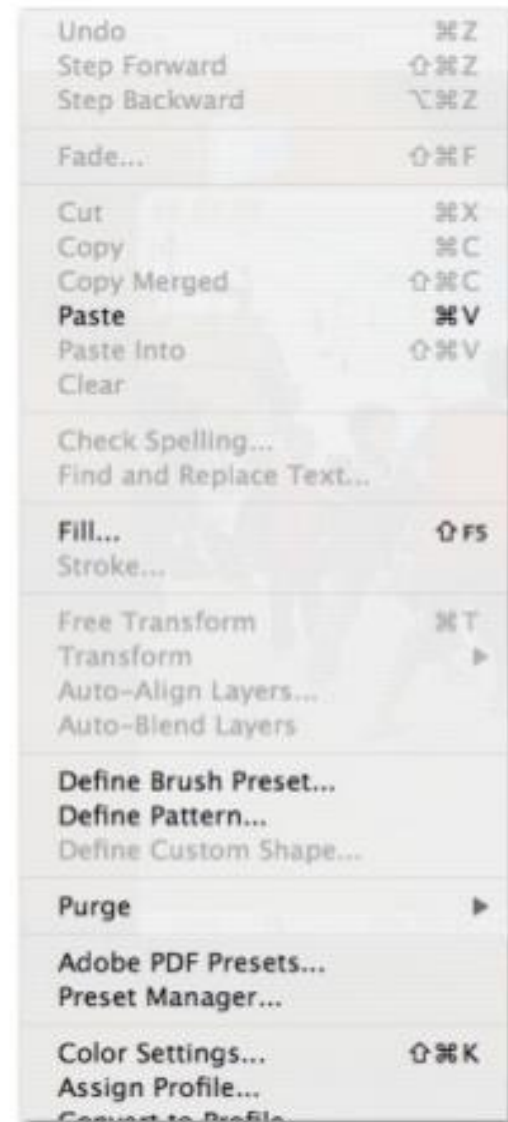
Restricting the kind of interactions that can take place





# 5. Constraints

- Restricting the kind of interactions that can take place
- Reduce the chance of error
- Can also work to focus user's attention to needed task



# 6. Consistency

- Designing interfaces that have similar operations and use similar elements for achieving similar tasks
- Easy to learn and use

**Finder** File Edit View Go Window Help

**Safari** File Edit View History Bookmarks Window Help

**Photoshop** File Edit Image Layer Select Filter View Window Help

# 6. Consistency



# 6. Consistency

1

The Blog Herald homepage showing a search bar, navigation menu, and a featured article titled "Google to Blogger?". The article text is partially visible, discussing Google's internal services and Blogger's role.

2

The Blog Herald homepage showing a search bar, navigation menu, and a featured article titled "Anglophobes Converging on us?". The article text is partially visible, discussing the influence of the Blogosphere on Anglophobes.

3

The Blog Herald homepage showing a search bar, navigation menu, and a featured article titled "Student's blog includes death threats". The article text is partially visible, discussing a student's blog that included death threats.

4

The Blog Herald homepage showing a search bar, navigation menu, and a featured article titled "How to blog in 5 posts". The article text is partially visible, discussing how to write a post in five parts.

5

The Blog Herald homepage showing a search bar, navigation menu, and a featured article titled "Scoble vs. Microsoft". The article text is partially visible, discussing a controversy between Scobleizer and Microsoft.

6

The Blog Herald homepage showing a search bar, navigation menu, and a featured article titled "Biogginetwork launches new celebrity blog". The article text is partially visible, discussing a new celebrity blog launched by Biogginetwork.

7

The Blog Herald homepage showing a search bar, navigation menu, and a featured article titled "YouTubers Riot Against Paris Hilton". The article text is partially visible, discussing a controversy involving Paris Hilton and YouTube.

8

The Blog Herald homepage showing a search bar, navigation menu, and a featured article titled "Quey Posts and Your Homepage Design". The article text is partially visible, discussing how to design a homepage for a blog.

9

The Blog Herald homepage showing a search bar, navigation menu, and a featured article titled "Amanda Congdon has something cooking". The article text is partially visible, discussing Amanda Congdon's activities.

# Why Design is Hard...

- Tradeoff when applying multiple design principles
- Number of things to control has increased dramatically
- Displays are more virtual/artificial
- Marketplace pressure
  - Adding operations cheaper (computers)
  - Adding controls expensive (real estate, cost)
- Errors becoming increasingly serious

# Try and Try Again

Norman thinks that it often takes 5 or 6 tries to get something “right”



# Questions?

- That's all for today!
- What's next?
  - We have talked about setting a foundational knowledge of what HCI is all about
  - Next, we start working in groups!
    - Next Thursday – group assignment and examples of past projects
    - Project management
    - Start thinking about topics/ideas over the weekend!