DESIGN OF INTERACTIVE SYSTEMS

6 OCTOBER 2027

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WELCOME

DESIGN OF INTERACTIVE SYSTEMS + TER

Lectures
Tuesday 13:45 - 17:15
Room D101

TER
Friday 13:30 - 17:00
Room E212

LECTURE 9

OVERVIEW

Category	Activity	Duration (min)	Start	End
Homework	Review Storyboard	10	13:45	13:55
Lecture	Participatory Design	70	13:55	15:05
	BREAK	20	15:05	15:25
Exercise/ Homework	Prepare WS	100	15:25	17:05

REVIEW HOMEWORK

Team — 30 min

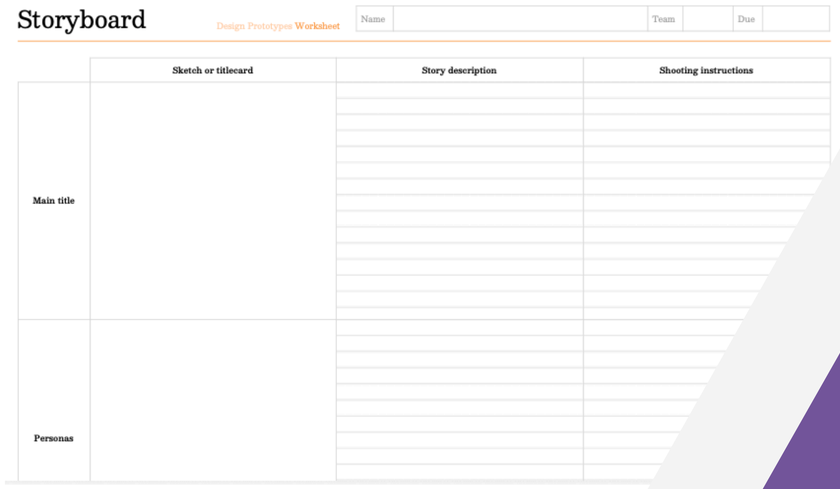
EXERCISE/HOMEWORK

STORYBOARD 2 ___

Revise your storyboard

so that you can update / reshoot

your video prototype next week…

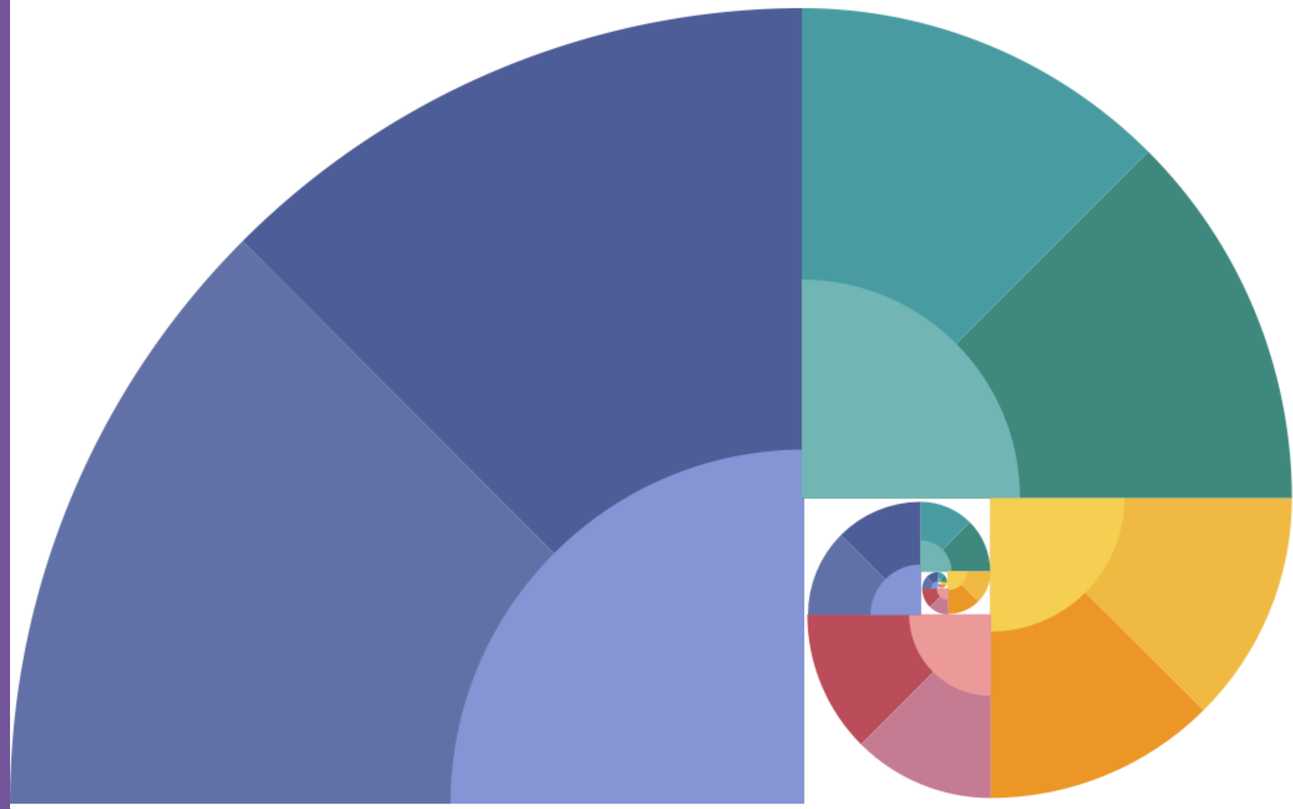


Storyboard Design Prototypes Worksheet

Name | Team | Due

	Sketch or titlecard	Story description	Shooting instructions
Main title			
Personas			

PARTICIPATORY DESIGN



PARTICIPATORY DESIGN

Situated Interaction with users

Involves users
throughout the design process

Is fundamentally
generative not evaluative

Values iteration
and rapid redesign

Explores breakdowns and the unexpected
not just perfection

PARTICIPATORY DESIGN VS. CO-DESIGN

PARTICIPATORY DESIGN VS. CO-DESIGN

Both include users in the design process

Including:

- Early interviews and observation
- Collaborative design activities
- On-going evaluations

Contrast with “standard” UX design:

- Interview users
- Develop system
- Test with users

PARTICIPATORY DESIGN VS. CO-DESIGN

Participatory Research treats participants as experience experts across a product, service, or system, **uncovering their unmet needs and desires** to show where design and development should focus.

Co-design engages end users as active partners in ideation and solution development, **exploring possible solutions** to the needs research has already identified.

WHY PARTICIPATORY DESIGN?

Understanding the user's perspective is hard

especially if you are not the user

Your instincts may be wrong

But ...

just asking questions may not be enough

Asking ≠ Showing

Participatory design helps ensure that you

maintain the user's perspective

As your design progresses
you may understand the system better
but stop paying attention to user needs

You need to reassess the user's perspective
at each phase of the design process

WHY PARTICIPATORY DESIGN?

Why involve users throughout?

Doesn’t it cost too much time and effort?

No, in practice,
participatory design **saves** time

Participatory design can:
prevent major errors
contributes new insights
generate inexpensive user innovations

CHALLENGES

USERS ARE EXPERTS...

USERS ARE EXPERTS...

at perceiving
user experiences

Do not expect users

TO DESIGN SOLUTIONS

Users are expert at:

experiencing the design problem

but rarely design the solution

Do not ask users to design

Do ask them to participate in the process!

DISTINGUISH BETWEEN:

Subject matter experts

Provide expert advice on content
May suggest work arounds and design ideas

But may lack an ‘ordinary’’ user’s perspective

Great for tutorial interviews
Sometimes good for story interviews

‘Ordinary’ users

Provide examples of real use
in real contexts
identify breakdowns

You need both!

CHALLENGE

Some users are hard to reach

Fragile populations

- Children, elderly, handicapped ...

Busy experts

- Pilots, doctors, lawyers …

Restricted locations

- Cockpits, control rooms, waste water plant

STRATEGIES

How do you reach users?

Ask them to come to you:

- Office, café
- Meeting room

Go to them:

- Home, office
- Class, conference, reception

When possible

- meet them in their environment

MANAGE EXPECTATIONS

When you work with users

Consider the context:

Educational vs. Research vs. Corporate

Be careful what you promise:

Exploring ideas vs. building a custom product

Check their background experiences.

Example: ‘‘yellow’’ family expected goodies from a focus group rather than true participation

Collaborative design activities include users and designers

Everyone participates
Everyone has equal access



EVERYONE PARTICIPATES
... INCLUDING YOU!



EXAMPLE

General Motors

GM executives thought car quality was great:

Every morning,

they left their cars in the garage

Experts tuned them

their cars rarely broke down

EXAMPLE

General Motors

GM executives thought car quality was great:

Every morning,

they left their cars in the garage

Experts tuned them

their cars rarely broke down

GM customers had a different experience

No daily tune-ups

Very poor reliability

Executives had no clue about what was wrong

They never experienced the problems

California Department of Motor Vehicles

Customer service was very, very slow
for regular customers

Executives skipped the lines

EXAMPLE

California Department of Motor Vehicles

Customer service was very, very slow
for regular customers

Executives skipped the lines

Innovation

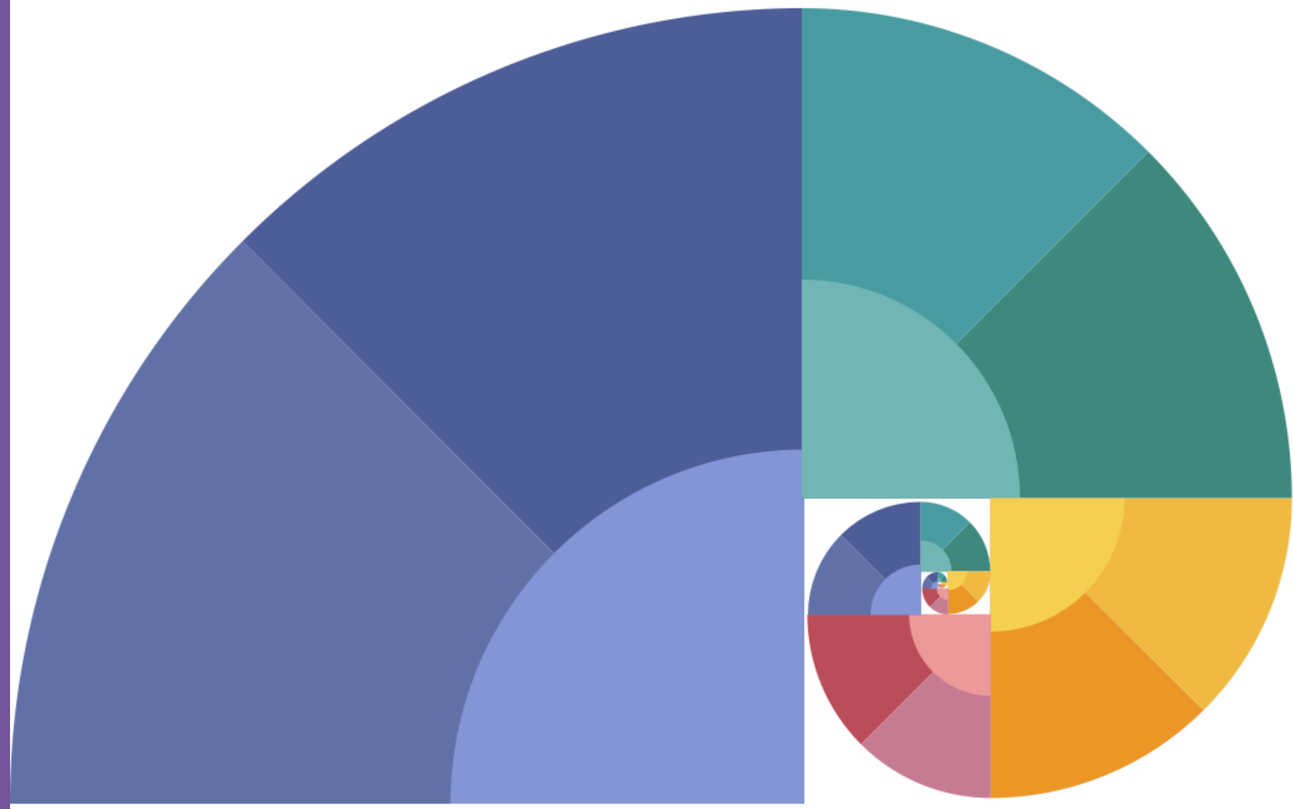
New director forced executives
to wait in same lines

Result

Many innovations
Faster responses
Shorter waiting times

EXAMPLE

PARTICIPATORY DESIGN METHODS



PARTICIPATORY DESIGN METHODS

Cultural probes

Technology probes

Workshops

PARTICIPATORY DESIGN METHODS

Cultural probes

Technology probes

Workshops

Gaver et al. (1999) Design: Cultural Probes

Goal:

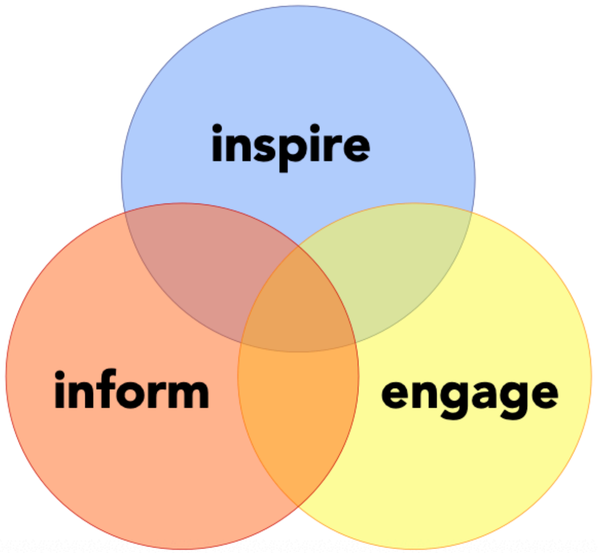
- Gather subjective, intimate material
- Explore a design space
- Challenge assumptions
- Validate predictions
- Look for the unexpected
- Create a dialog with users

CULTURAL PROBES

Gaver et al. (1999) Design: Cultural Probes

Strategy:

- Involve users
- Consider privacy
- Create simple resources
- Limit the time



CULTURAL PROBES

Daily diary is a generative design method

Participants use physical kits or digital tools

Record over time their

- daily routines
- thoughts
- feelings



DAILY DIARY

Dream Recorder Example

A cheap digital memo-taker

Contained instructions to use upon awakening from a vivid dream

Pulling the tab activated the device

An LED indicated that there was 10 seconds to describe a dream

After that, the device shut down



DREAM RECORDER

Question Camera Example

Disposable camera

Contained requests for particular pictures.

Request were extremely open-ended or absurd:

"something you'd like to get rid of"

"the spiritual centre of your home" and "something red"

Goal was to see how people dealt with problematic requests



QUESTION CAMERA

PROBE IT

ALICE CHEN | 301047001
ADAM GREENBERG | 301035916
JACKY SHEN | 301052679
NICK WEED | 301105915



SHOOT IT







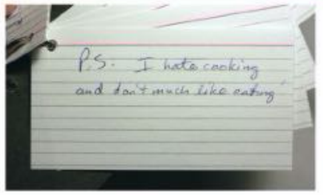
The photos taken by the recipient were by far the most playful results wee obtained, and the ones that gave the most insight into their lives in an intangible way. Seeing faces and specific objects allowed us to connect with them on a level the other items did not allow. The items active people took photos of were interesting, though predictable (with exceptions of course). The sedentary recipients had a much more varied collection of images to share, and a chose to show us much richer side of themselves

MAP IT




Perhaps the most interesting insight the maps provided was not the places visited (which were congruous with expectations) but instead the method by which different recipients portrayed their activities. In all probes but the non-active one, activities were almost exclusively related to recreational physical activity, and were portrayed by lines to represent distance travelled. In the sedentary probe, activities were more ranging in subject, but were invariably represented by a circle. This implies a different approach to the importance and meaning of journey and destination.

EAT IT



The most significant finding the recipe cards revealed was a total lack of correlation between activity level and diet. One active participant admitted his favorite meal was frozen and from costco, and gave in the above card as an aside after his recipes.

STAB IT




The completed foam dolls revealed a fundamental difference in active and sedentary people's approach to pain. While the sedentary doll was covered in complaints, the injuries were a point of pride to the active people (as further revealed in the exit interviews). Strangely, there was no obvious correlation between amount of pain and lifestyle

HEAR IT

The quality of audio in found in the results varied, making some unusable. The ones that came out clear counteracted our assumptions of active people, with one very active person choosing a coffee shop full of the sounds of people and music, instead of the assumed nature.

SHARE IT



The tumblr was a hit and miss item, depending on the idiosyncrasies of the recipient. It did not produce the desired scrapbook effect, instead it seemed like a forced attempt. It did reveal personal traits about each recipient and their families, but no trends were noted.

PARTICIPATORY DESIGN METHODS

Cultural probes

Technology probes

Workshops

TECHNOLOGY PROBES

Hutchinson et al. (2003) Technology probes

Goals

Inspire users and designers to
generate new design ideas

Understand how a technology is used
in a real world setting

Study emergent behavior patterns
around new technologies

Create common ground for
subsequent design

Combine 3 perspectives

Scientific

Collect data

Impartial analysis

Inform designers



Engineering

Respond to given problems

Make technical compromises

Ensure it works ‘in situ’



Design

Seek inspiration

Redefine the problems

Generate innovations



CHARACTERISTICS

Technology probes are not prototypes

Simple, single function technology

Installed in home settings
for long periods of time

Open to reinterpretation by users

Instrumented to log data

Include follow-up prototyping
in participatory design workshops

CHARACTERISTICS

	Technology probes	Prototypes
Simplicity:	Single function	Multiple functions
Usability:	Not the focus	Major focus
Logging:	Major requirement	Secondary requirement
Flexibility:	Open-ended	Specified purpose
Originality:	Unusual, provocative	Relevant to needs
Design cycle:	Early-middle	Middle-end
Longevity:	Throw away	Evolvable
Concept:	Still unclear	Well defined

MESSAGE PROBE

Example Message Probe

Conversation: grandparents & children

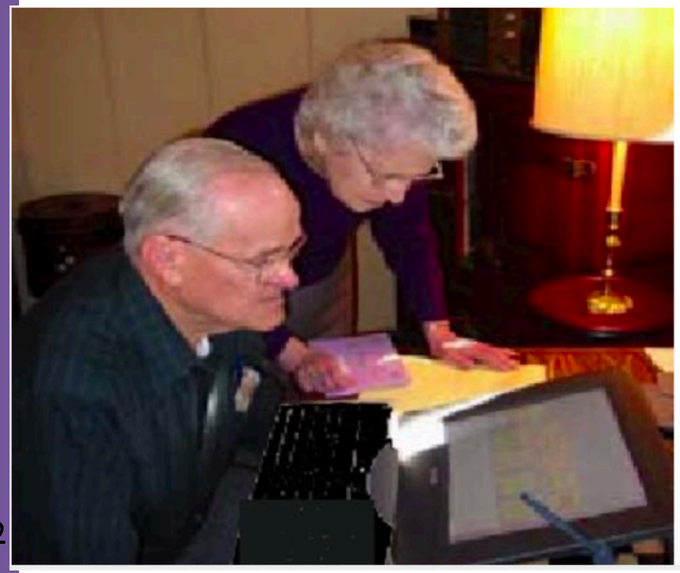
Hand-written notes on a tablet screen

Synchronous or asynchronous

Zoomable interface

All notes shared among all households

Temporal or selected order



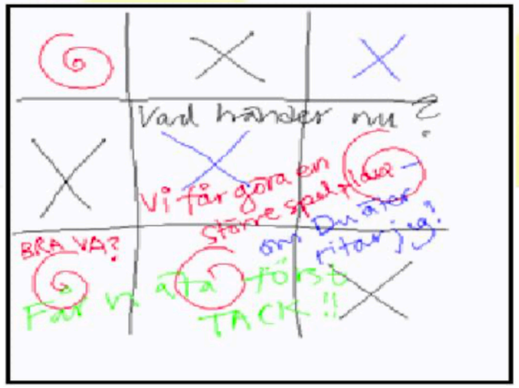


MESSAGE PROBE

Example Message Probe

Message? Chat? Game?







Family-to-family connection

Images from a video camera

No motion 3 sec. = 1 image

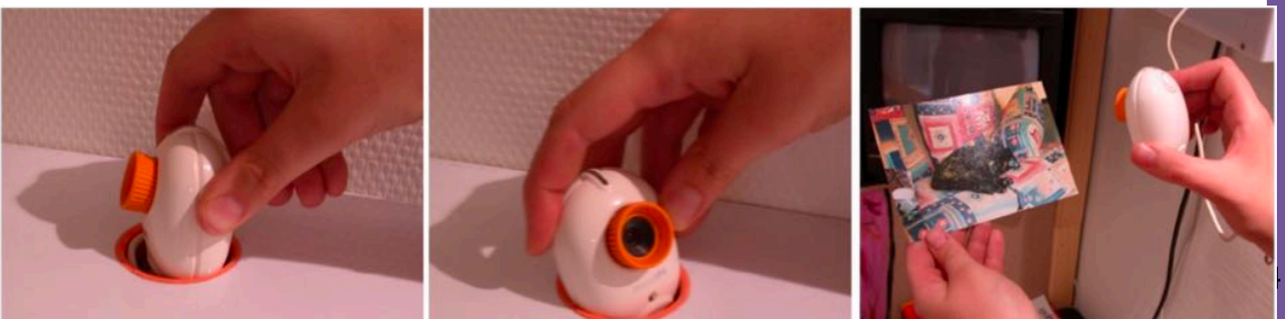
Image archive

shared between households

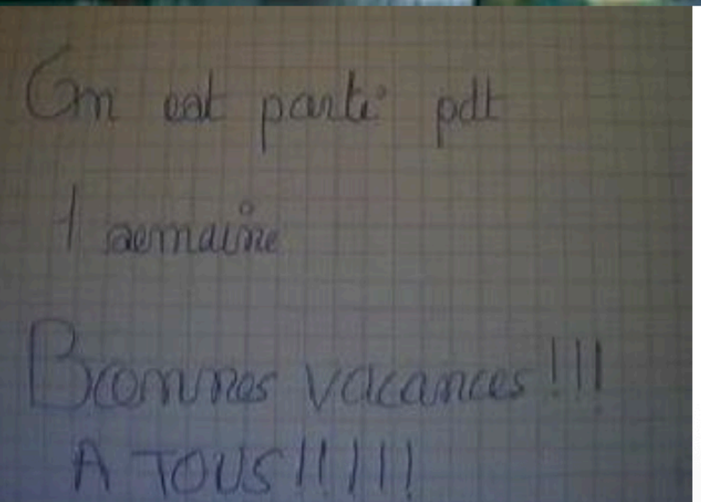
View images with a remote control

Images fade unless explicitly save

VIDEO PROBES







We're going away for a week

Happy Vacation to everybody!!

VIDEO PROBES

MIRRORSPACE

Example MirrorSpace

Instead of a high-resolution video image

Blur the image according to the distance:

- Far away: blurry image
- Approach: crisp image

Users control privacy by moving in space



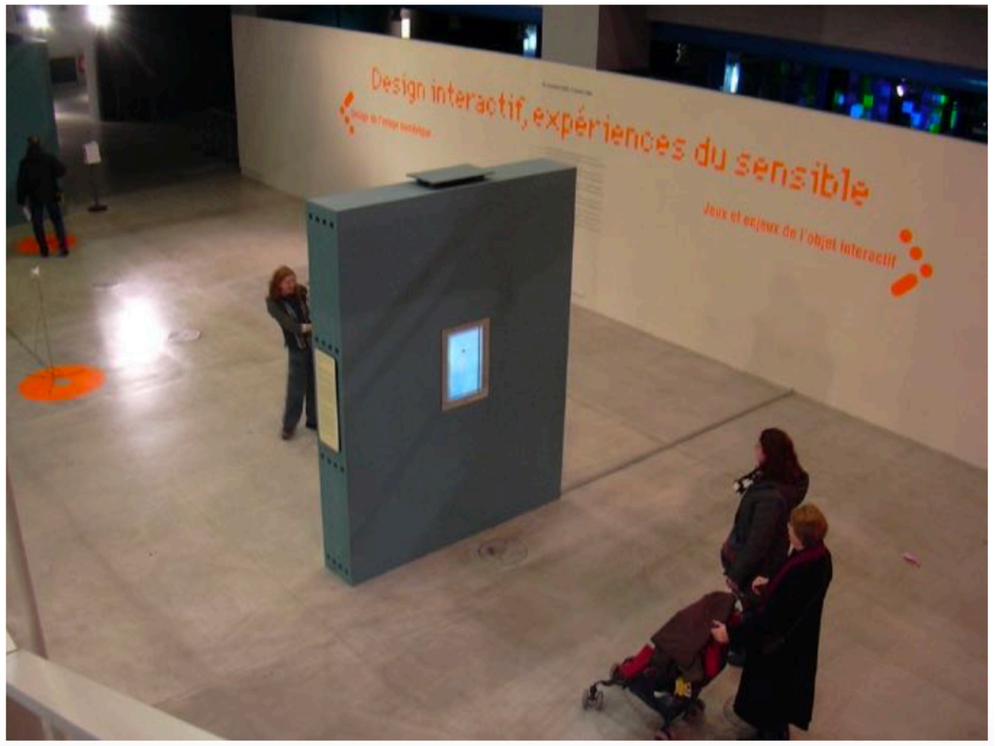
MIRRORSPACE

Example MirrorSpace

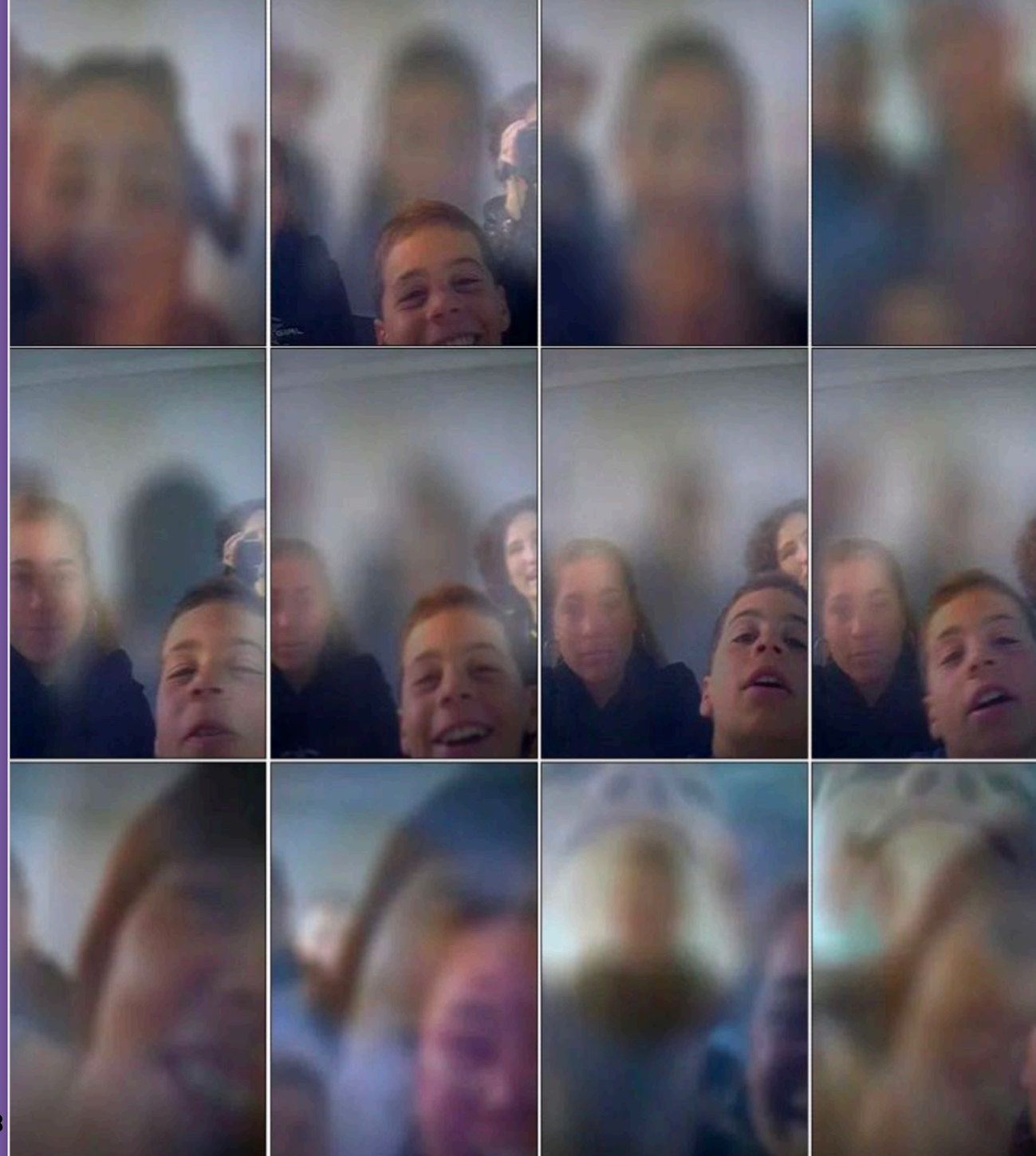
Exhibits: La Villette, Centre Pompidou

People who know each other approach and play with each other's faces ...

Strangers immediately step back



MIRRORSPACE



TECHNOLOGY PROBES

Design considerations

What do you want to find out about your users?

Choose an existing device that can:

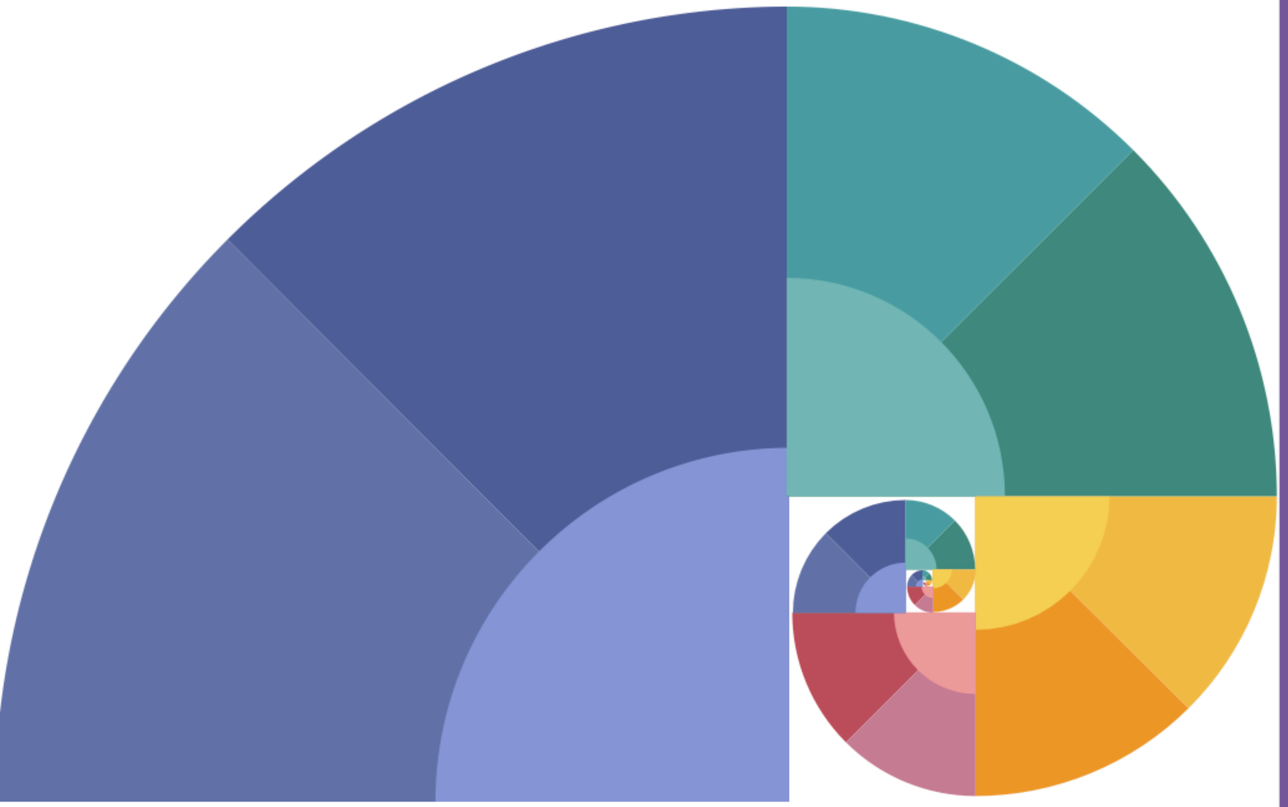
- capture relevant information from them
- provide a new experience for them
- inspire ideas relevant to your project

Cultural probes help

- Discover user characteristics

Technology probes help

- inspire new designs



PARTICIPATORY / CO- DESIGN WORKSHOPS

Cultural probes

Technology probes

Workshops

PARTICIPATORY / CO- DESIGN WORKSHOPS

How can you get information from users?

Create an exercise after a class
  students perform exercises at end of class

Experiment debriefing
  Participants interview each other after a session

Corporate meetings
  expose everyone to interactive design techniques
  then ask them to try an exercise

Seminars or conferences (sessions or banquets)
  get specialized interviews from doctors,
  air traffic controllers, fighter pilots and
  other hard-to-access users

STRATEGIES

First consider:

- Where are you in the design process?
- What information do you need?
- What resources do you have?
- What design artifact would help?

Build on existing methods

- or create something new

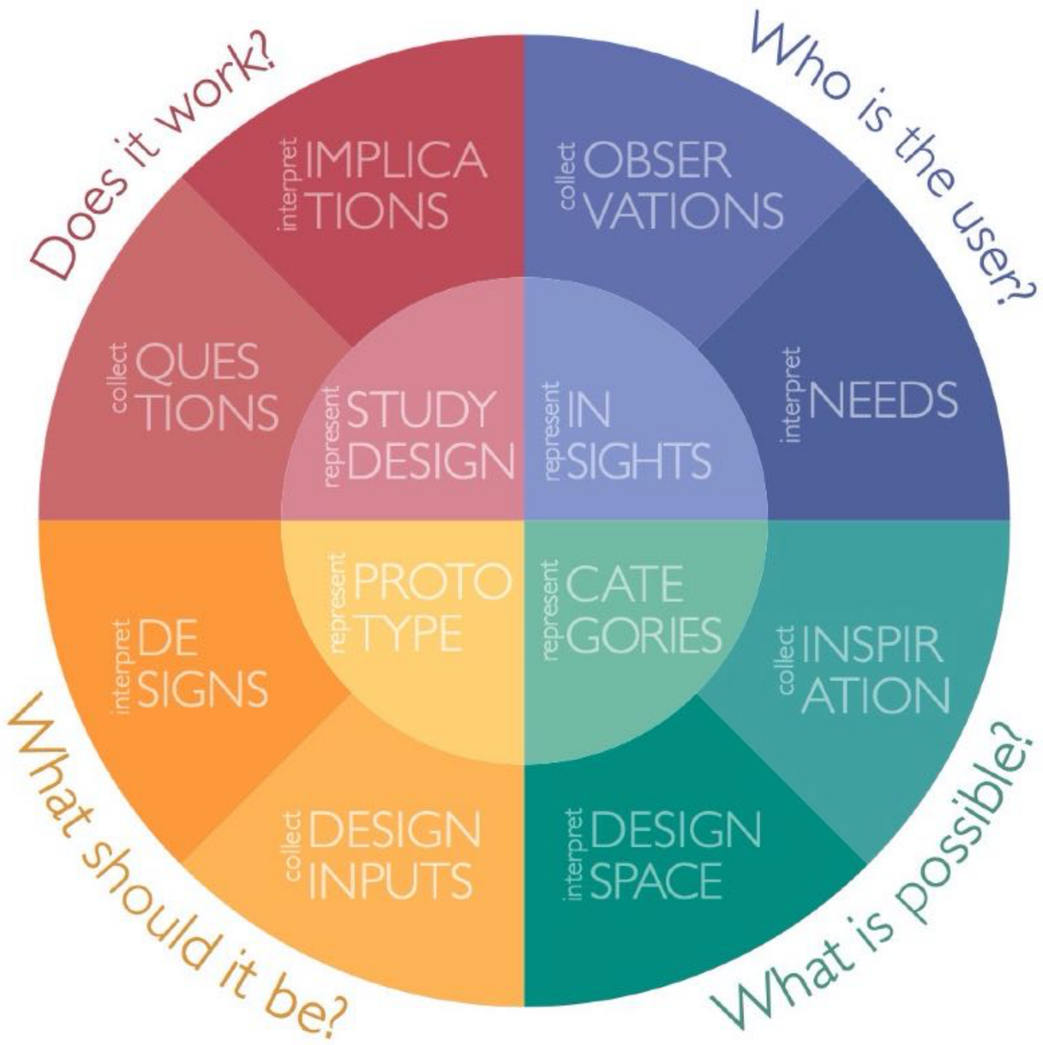
CREATE YOUR OWN METHODS

Bring together users and designers
Create an environment for collaborative
exploration of ideas

Activities can:
capture experiences
create scenarios
brainstorm ideas
explore ideas

Do not ASK users what they think
Instead, help them show you

CREATE YOUR OWN METHODS



Build on existing methods

About users:	Interviews, current scenario, persona, cultural probe, technology probe
Create ideas:	Brainstorming, video brainstorming, web links
Prototype:	Future scenario, storyboard, video prototype, design concept, design diagram
Evaluate:	Design walkthrough, field studies, experiments
Redesign:	Generative walkthroughs, structured observation

DESIGN A WORKSHOP

Decide on:

- Participants
- Setting
- Schedule
- Activities

Ratio of team members to users?

Preparation:

- Materials?
- Pre-workshop activities?

Workshop activities:

- Which activities from class are appropriate?
- Can you think of any others?

Follow-up activities:

- What do participants get as a result of participating?

How do participants benefit?

- Need not be money or gifts …
- but participants should benefit

DESIGN A WORKSHOP

Clear objectives:

What do you need for your design now?

Limit time:

Don’t waste your time or theirs!

Final activity:

Consider adding a final debriefing

Plan activities carefully:

Create:

- Schedule
- Method cards
- Notes
- Images/Video

Roles:

- Time keeper
- Facilitator
- Scribe
- Camera person

PARTICIPATORY DESIGN WORKSHOP

Criteria for choosing methods

Accessible to everyone

Both users and designers participate*

**may* exclude facilitator

Focus on user's strengths, knowledge & skills

Fun and interesting

Mixed set of activities within the session

Participatory & Co-design workshops

Create useful design artifacts

Methods can involve:

solo, pairs, groups

symmetric or asymmetric relationships

PARTICIPATORY DESIGN WORKSHOP

Criteria for choosing methods

Gather new insights about users:

- context
- perspective
- interests
- fears
- problems
- joys

Gather insights about the design

- shift the design problem
- new alternatives
- revised concept

Avoid simply confirming your design

PARTICIPATORY DESIGN WORKSHOP

Example: Poster design

Problem:

Teach non-designers about eye movment

Exercise:

Two participants back-to-back

One describes a poster,

the other draws it

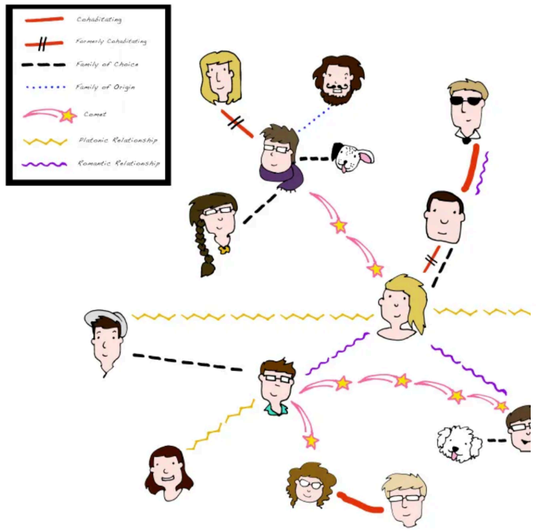
PARTICIPATORY DESIGN WORKSHOP

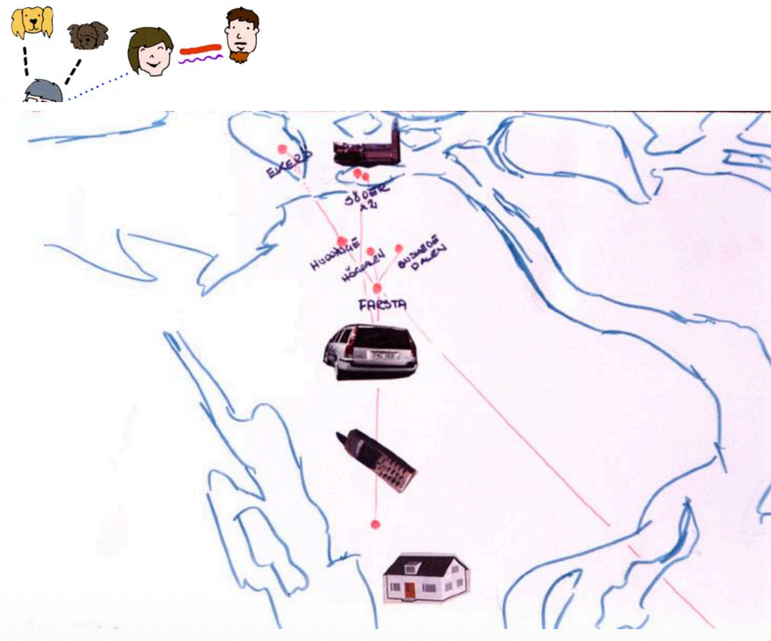
Example: Remote families

Problem:

How do people think about their families?

Exercise: Create a ‘relationship map’



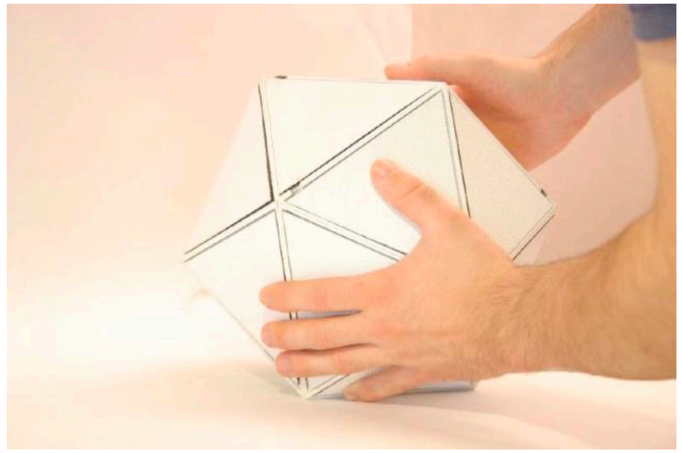


PARTICIPATORY DESIGN WORKSHOP

Criteria for choosing methods

Problem: Expand participants' ideas

Exercise: Create inspiration cards
actors, features, metaphors



TASK - CONTEXTS

Location | *Lieu*

.At home

A la maison

.At work

Au travail

TASK - CONTEXTS

Activity | *Activité*

.*Reading*

Lecture

.Passively listening to music

Ecoute passive de musique

Activity cards

FEATURE

Positioning

able to track
geographical location

Positionnement

capable de localiser geographiquement

FEATURE

Color

dynamic or static color

Couleur

dynamique ou statique

TASK - CONTEXTS

Emotional | *Emotionnel*

.*Happy mood*

Humeur joyeuse

.Sad mood

Humeur triste

METAPHORS

Compass

Boussole

FEATURE

Amorphous

dynamic or static shape

Amorphe

forme fixe ou dynamique

FEATURE

Display

object as a display
part of object is display

Affichage

L'objet est écran ou une partie de l'objet est écran

METAPHORS

Flip book

METAPHORS

Note book

Cahier de notes

FEATURE

Interaction

one-handed interaction
two-handed interaction
hands-free interaction

Interaction

interaction avec une main, interaction bi-manuelle, interaction main libre

FEATURE

Haptic Feedback

passive/active, tactile, vibrating, ...

Retour Haptique

passif/actif, tactile, vibration, ...

PARTICIPATORY DESIGN WORKSHOP

Example: Remote families

Problem: How to help children reflect on their family relationships?

Exercise: Collect photos from an "alien's perspective"



Each group

Prepare a 45-minute
participatory design session for another group

- Design 2 activities (NOT interviews!)
- Create 2 method cards

Ensure that you use the whole session!

If your session is too short or if it isn't working
use prepared backup activities

Do not waste participants' time!

PARTICIPATORY DESIGN WORKSHOP

METHOD CARDS

Front: Clear, concise instructions

What should the participant do?

Back: (optional)

Work space for the exercise

Facilitator first reads the instructions then distributes cards to participants

Cards may differ if participants do different activities

(Example: poster exercise)

PLAN FOR SPONTANEITY!

Embodied activities

- Act it out
- Draw it
- React to it
- Pretend to be it
- Visualize it

Critical activities

- Challenge existing ideas
- Shift perspectives
- New angle



MAKE THINGS!

Specific instructions

Summary

2. Activity title

Specific instructions

Summary

1. Activity title

Catchy title

3. Activity title

Summary

Specific instructions

Back of booklet

Project name

DO **NOT** CREATE ACTIVITIES
THAT EVALUATE YOUR DESIGN!

INSTEAD:

DISCOVER NEW USER NEEDS
GAIN NEW INSIGHTS
GENERATE NEW IDEAS

REMEMBER

Ensure that ***everyone*** participates!

- Designers may **not** just observe

Design team has additional roles:

Facilitator

- presents instructions (method cards)
- keeps track of time
- answers questions

Scribe

- takes notes

Camera person

- operates camera

ADVICE

Plan enough time to:

- describe the activity
- perform the activity
- debrief

Optional:

- Use Video Clipper to capture video

- Create a **title card** for each Method
- Include invisible notes with:
  - Timing
  - Method card text
  - Other shooting advice

Shoot video of each activity and object

BREAK

EXERCISE/HOMEWORK

PD WORKSHOP PREPARATION

Prepare a participatory design workshop:

45 minutes with two activities

Consider:

- What information do you need now?
- How can you get it in an entertaining way?

Remember:

- Everyone (both groups) must participate!
- including moderators and scribes

Activities should be fun and interesting for all participants.