

Building User Interfaces

Design Thinking

from Empathy to Ideas

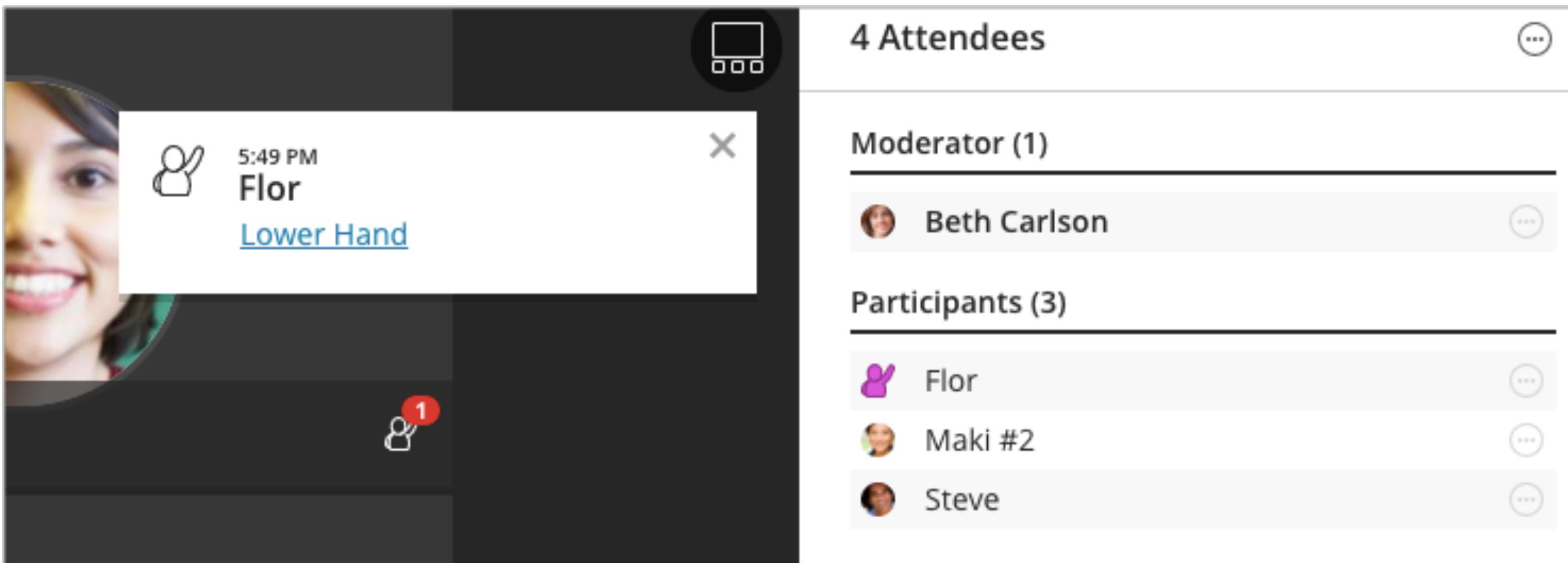
Professor Bilge Mutlu

What will we learn today?

- Design thinking and process
- Step 1: How to empathize with users
- Step 2: How to turn data into insight
- Step 3: How to generate design ideas
- Sketching, conceptual design, storyboarding

Live Q&A

During BBCollaborate Ultra lectures, (1) write in the chat, which Cole and I will monitor, or (2) use the "Raise Hand" feature  to speak.



What is *design thinking*?



NN/g

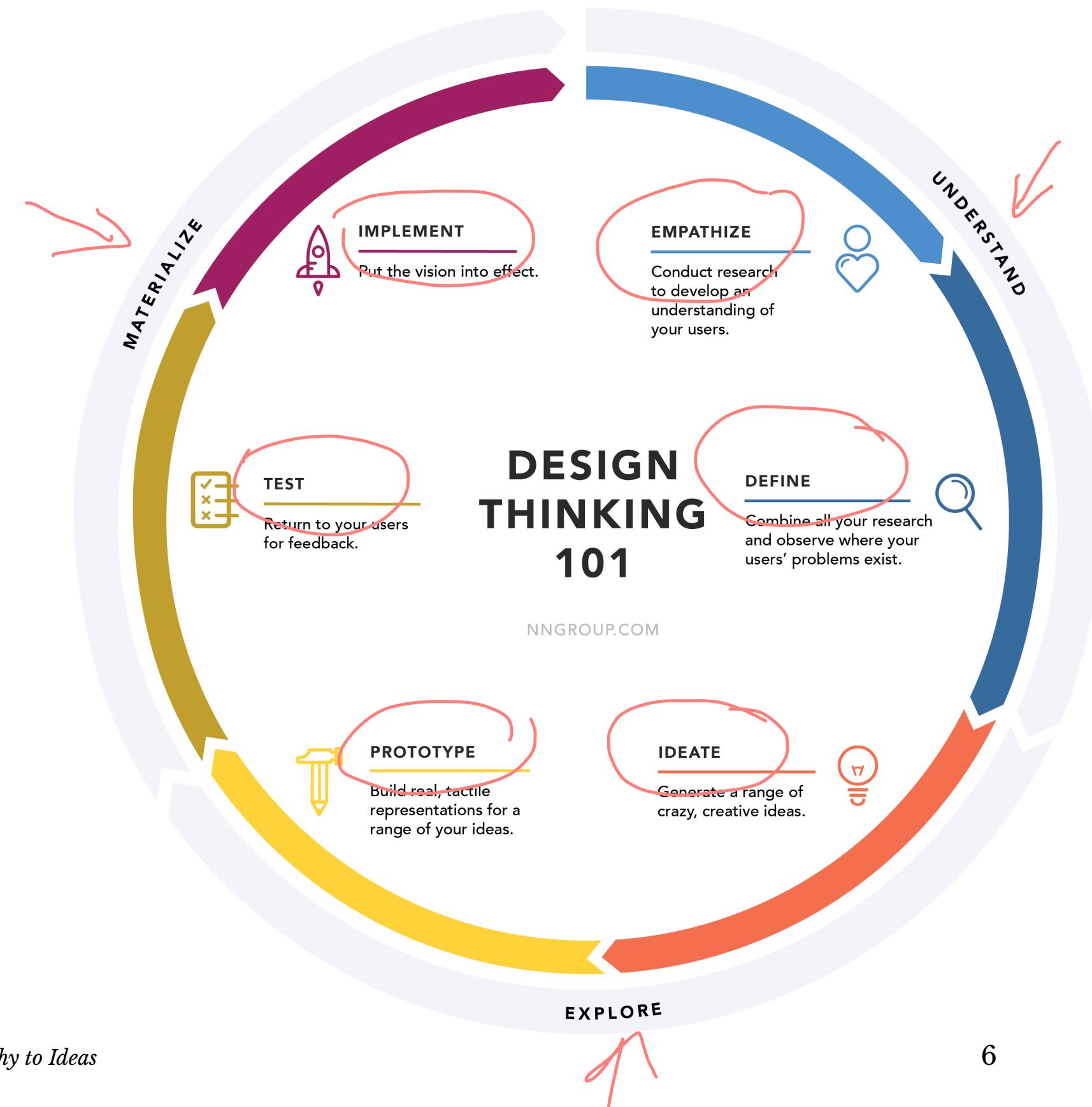
Design Thinking
101

Design Thinking 101

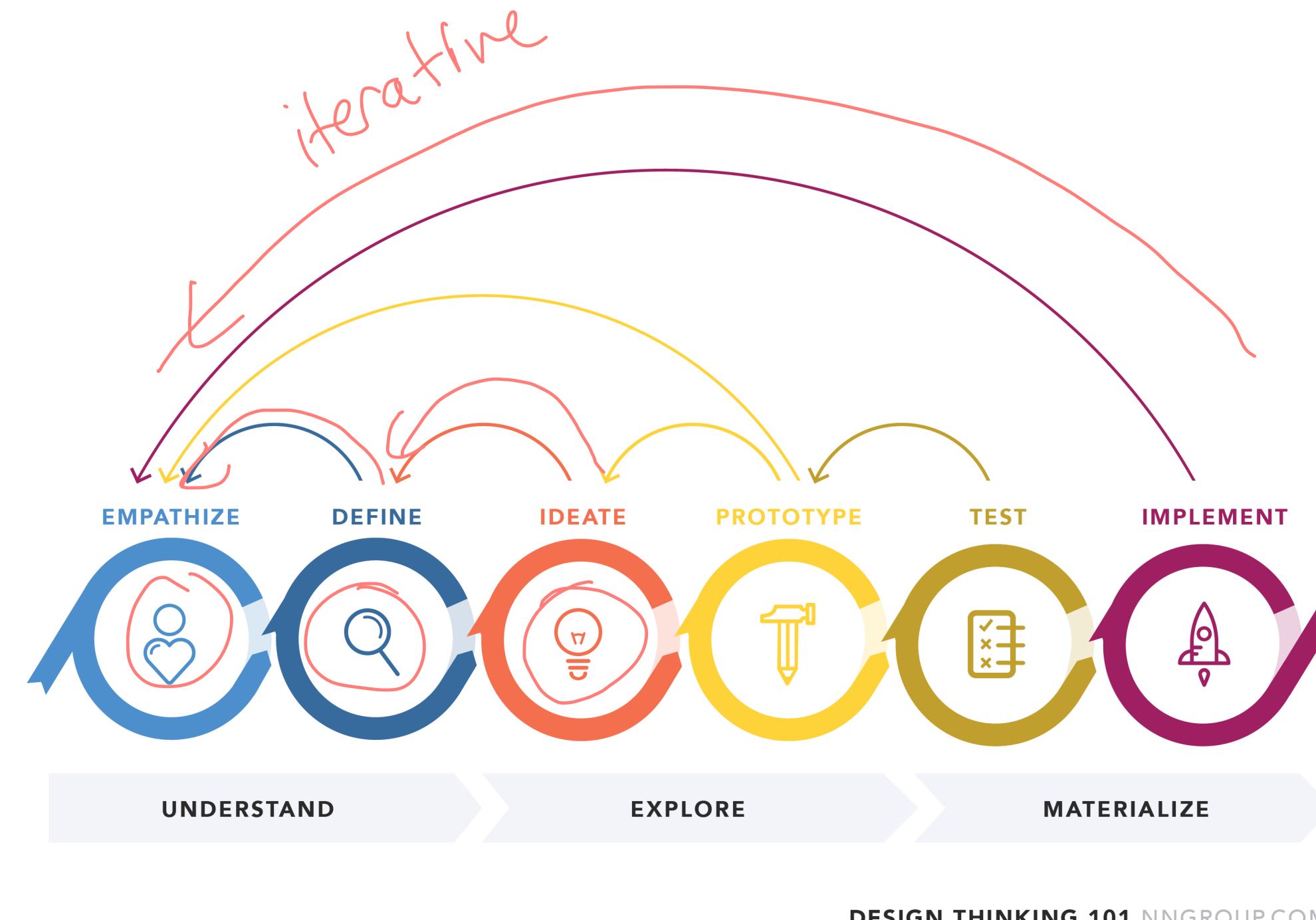
Design thinking has two components:

1. An **approach**: a hands-on, user-centric approach to innovative problem solving
2. A **process**: a 6-phase process to understand problems, explore solutions, and materialize them

Source²



² NN/g Design Thinking



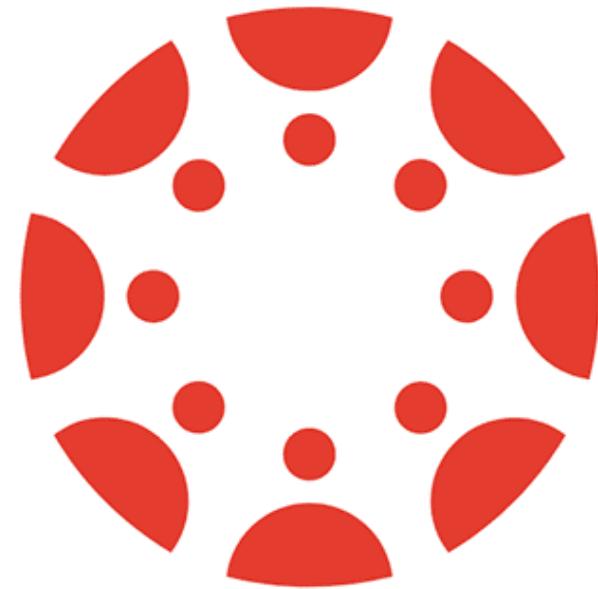
³ NN/g Design Thinking

Takeaways

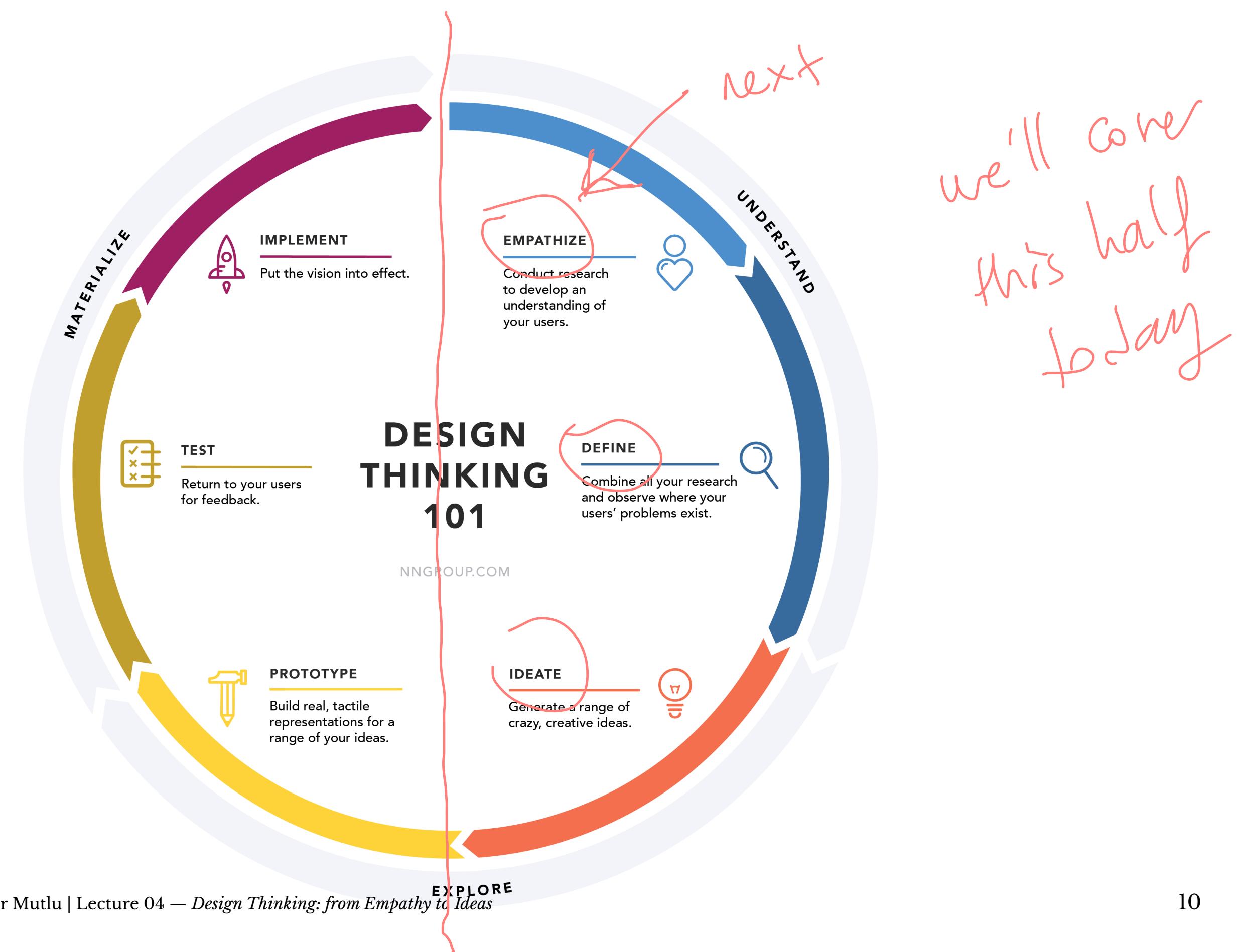
1. Approach problems like a designer ✓
2. Follow a process ✓

Quiz 1

Complete the Canvas quiz.



canvas



Empathize

(aka User Research)

How do we empathize with users?

Understanding user needs, preferences, and expectations by studying what users do, say, think, and feel.

There are many methods to build empathy.



4 NN/g UX Research Methods

The simplest and most powerful method for empathy:

think-alouds

"The #1 Usability Tool" – Jakob Nielsen

Source⁵



⁵ Nomensa

How to conduct a think-aloud

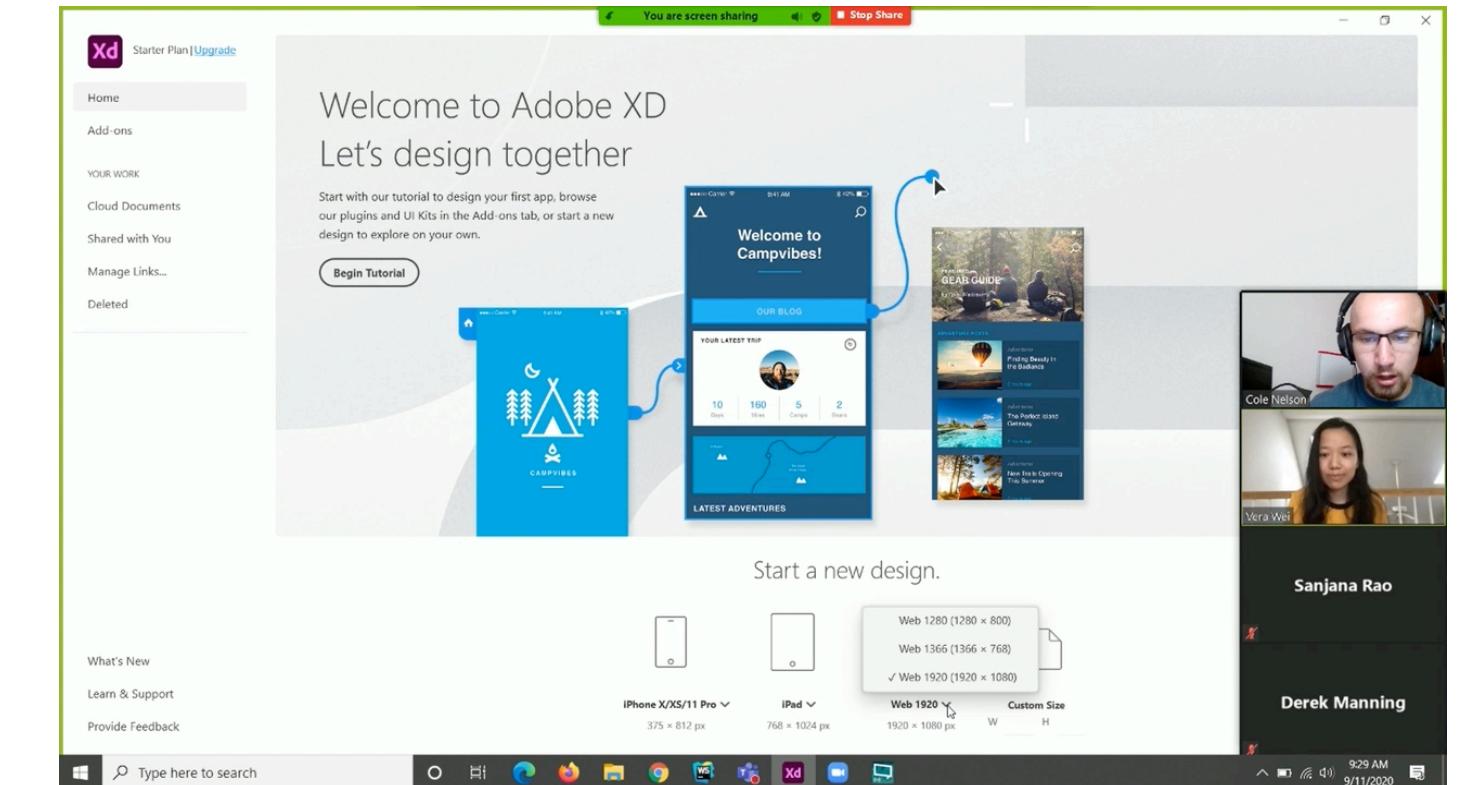
1. Identify representative users ✓
2. Ask users to perform representative tasks ✓
3. Observe and record what they *say* and *do* ✓
4. Analyze your data to develop design insight ✓

encourage
thinking
out loud

In-class Activity: Adobe XD

In-class Activity: Part I – the think-aloud

We will watch a 10-minute video of a *think-aloud session* with a novice user performing a set of tasks in Adobe XD.



What you should do⁶

Do: Grab a post-it note on this Google Drawings canvas (or create one if none left). Write down one key observation on the post-it note. Hold onto your post-it note until later. ➡ *Repeat for additional observations.*

Pro tip: Write concisely but in a way that others can understand; write the name of the source; color-code types of note; use a Sharpie! ➡ *Applies to physical post-it notes.*



⁶Cooper-Wright

Think-aloud Tasks

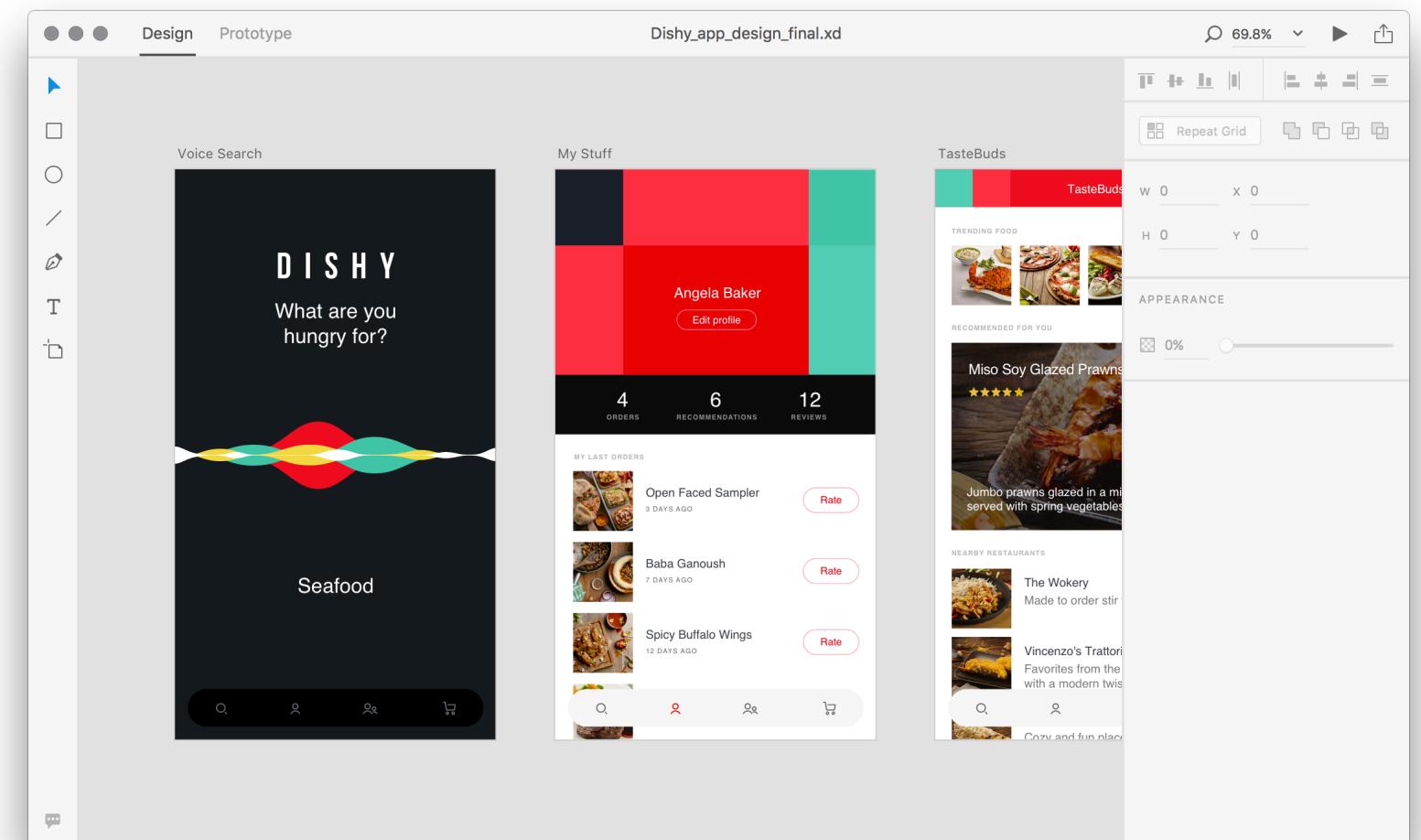
Task 1: Start a new design for the web at size 800 x 600.

Task 2: Create a red button in the center of the canvas.

Task 3: Create a second canvas and place a blue button in the center.

Task 4: Link red button to second canvas and blue button to first.

Task 5: Simulate your design.



Starter Plan | [Upgrade](#)

Home

Add-ons

YOUR WORK

Cloud Documents

Shared with You

Manage Links...

Deleted

What's New

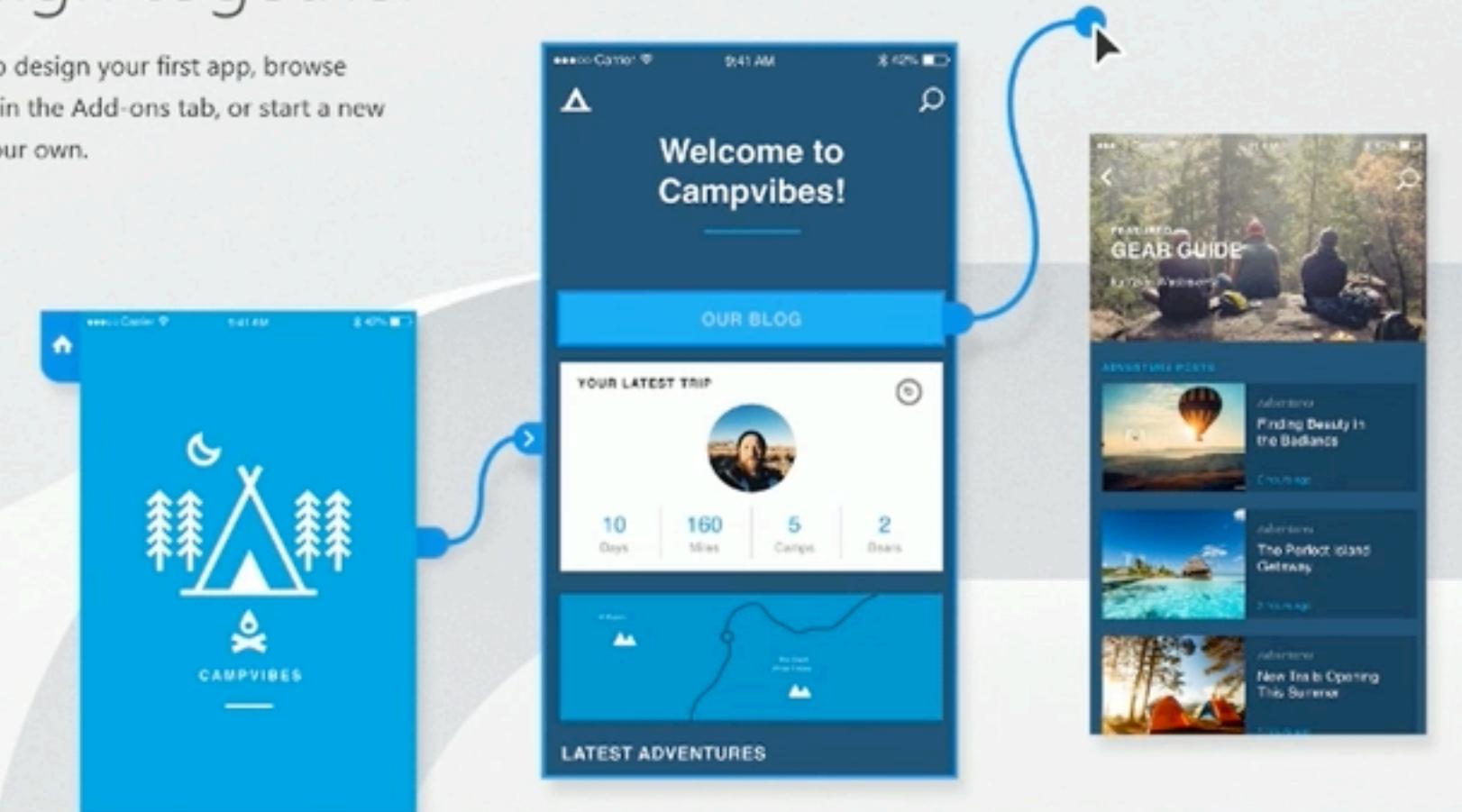
Learn & Support

Provide Feedback

Welcome to Adobe XD

Let's design together

Start with our tutorial to design your first app, browse our plugins and UI Kits in the Add-ons tab, or start a new design to explore on your own.

[Begin Tutorial](#)

Start a new design.



Web 1280 (1280 × 800)
Web 1366 (1366 × 768)
✓ Web 1920 (1920 × 1080)

iPhone X/XS/11 Pro

375 × 812 px

iPad

768 × 1024 px

Web 1920

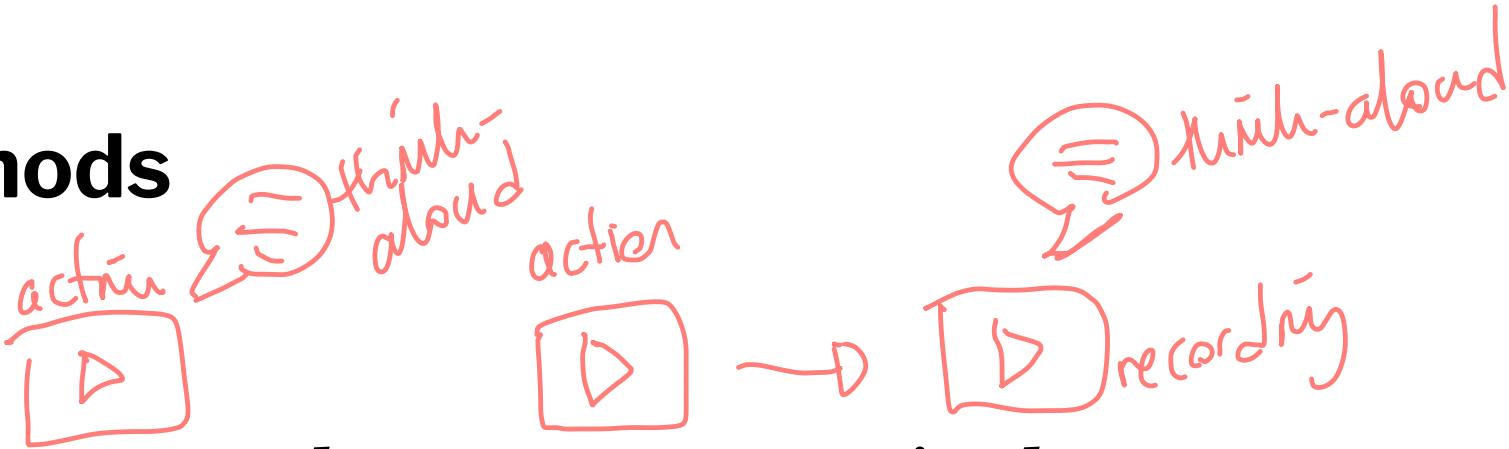
1920 × 1080 px

Custom Size

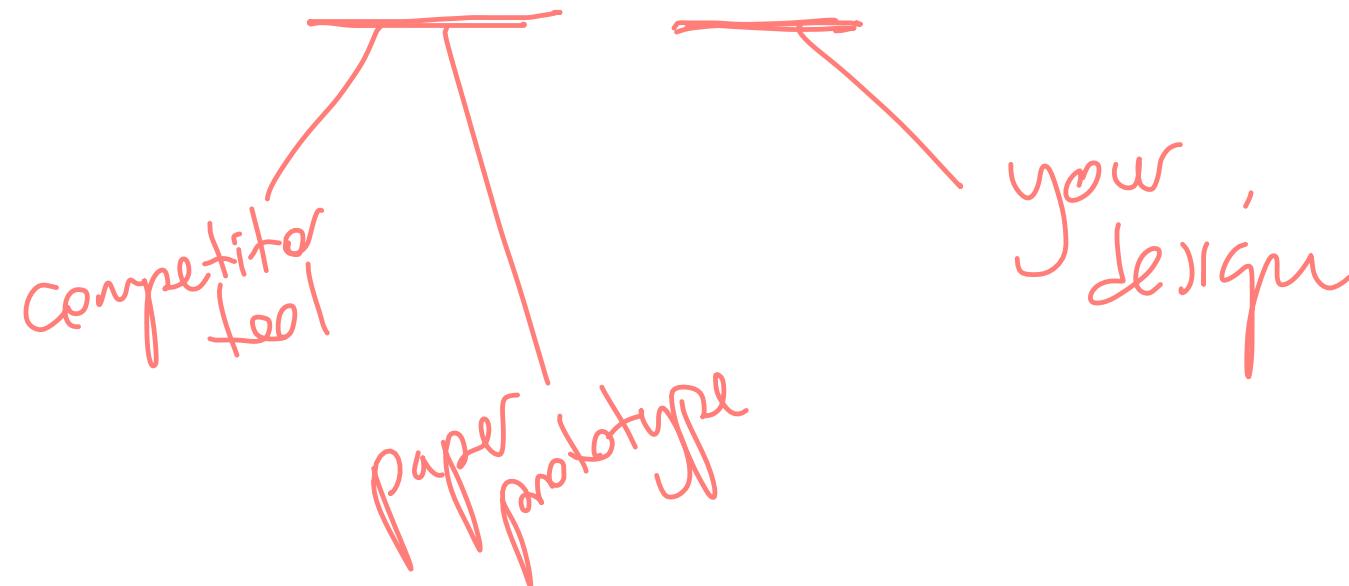
W H

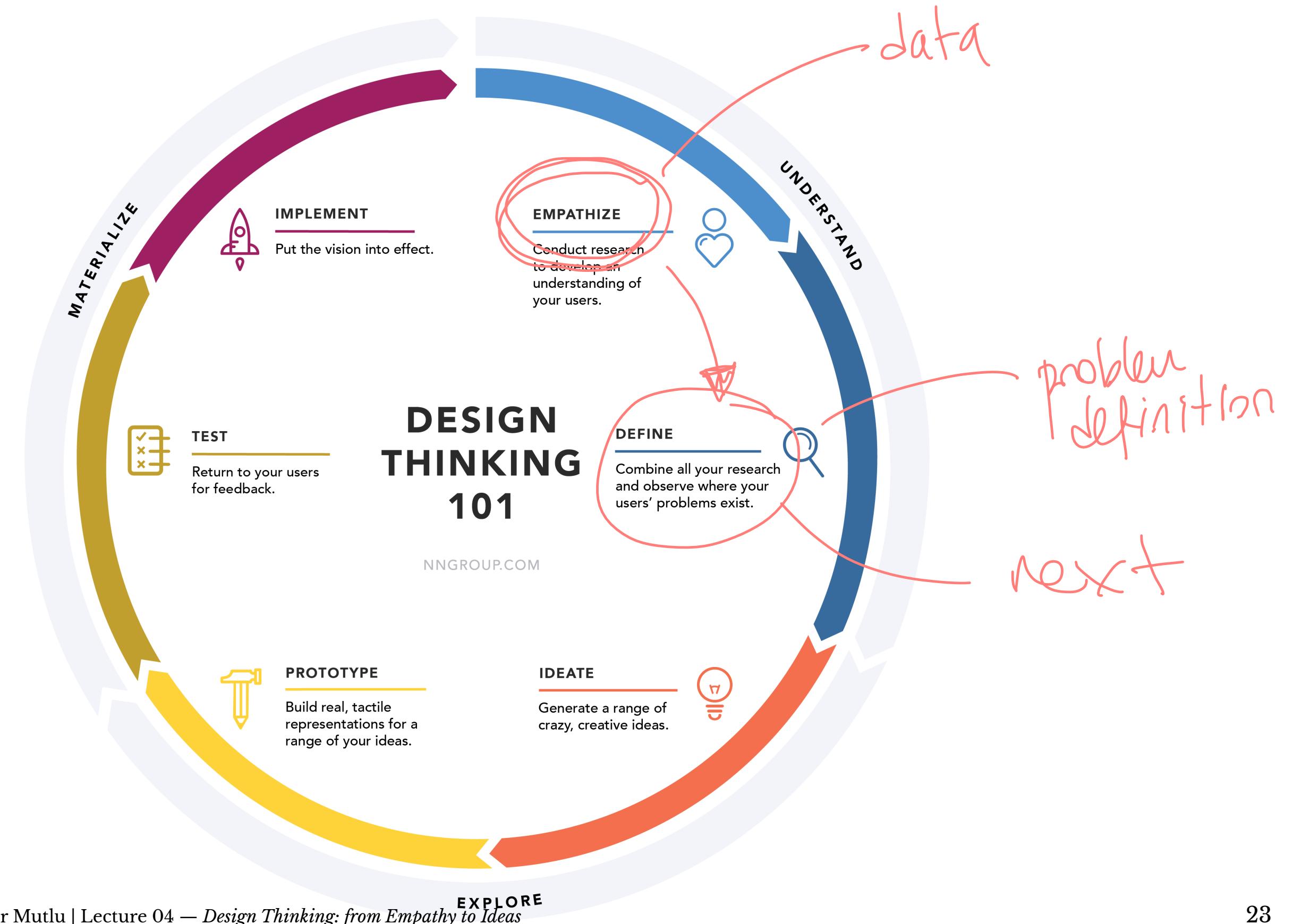


More on the TA methods



- Can be done concurrently or retrospectively
- Can be applied to pretty much anything
- Can be done *before* or *after* design





Define

What does that mean?

- Gathering all findings — **gather** ✓
- Consolidating, categorizing, distilling — **analyze** ✓
- Translate into insight — **recommend** ✓

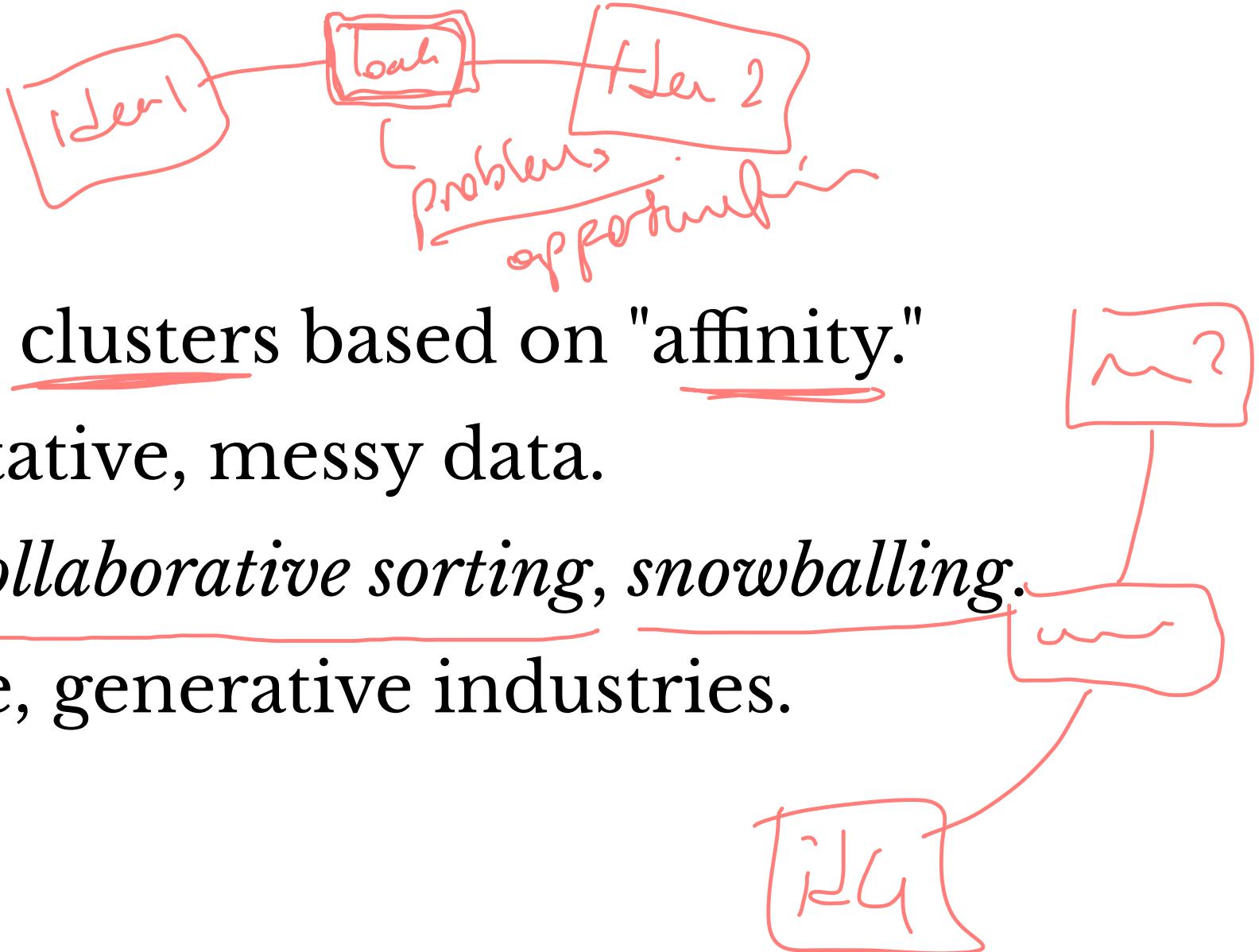
But how do we go about this?

- Again, there are many methods for analysis.
- The simplest and most powerful method is *affinity diagramming*.



Affinity Diagramming

What is it?



- Definition: Organizing data into clusters based on "affinity."
- It helps you make sense of qualitative, messy data.
- Also known as affinity mapping, collaborative sorting, snowballing.
- Used across the board in creative, generative industries.



⁷ [NN/g Affinity Diagramming](#)

NNGROUP.COM **NN/g**

How do we go about it?

- Step 1: Start an initial set of categories ✓ ③
- Step 2: Sort notes into these categories
- Step 3: Add subcategories or consolidate categories as needed
- Step 4: Present each category ✓
- Step 5: Rank categories in severity, combining importance, prevalence, frequency

②

③

→ three components

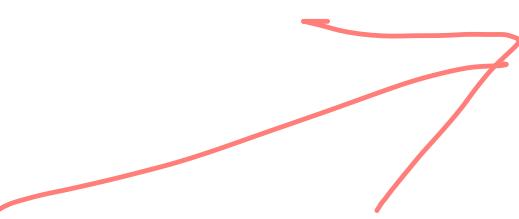
①

iterative

How do we go about it? Continued.⁸

Pro Tip: Steps 2–3 will likely be iterative.

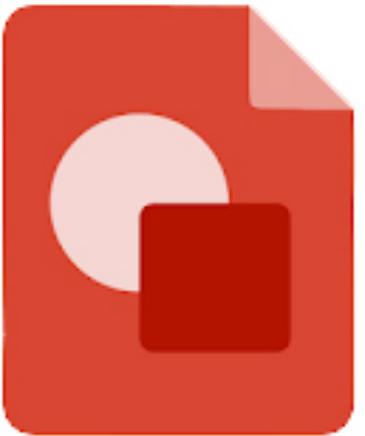
Pro Tip: Assign team members to categories who will be responsible for all the sorting and presentation of the categories



⁸ Image source: [UX Collective](#)

In-class Activity: Part II – affinity diagramming

Now, let's get back to the Google Drawings canvas and follow this process.



Google Drawings

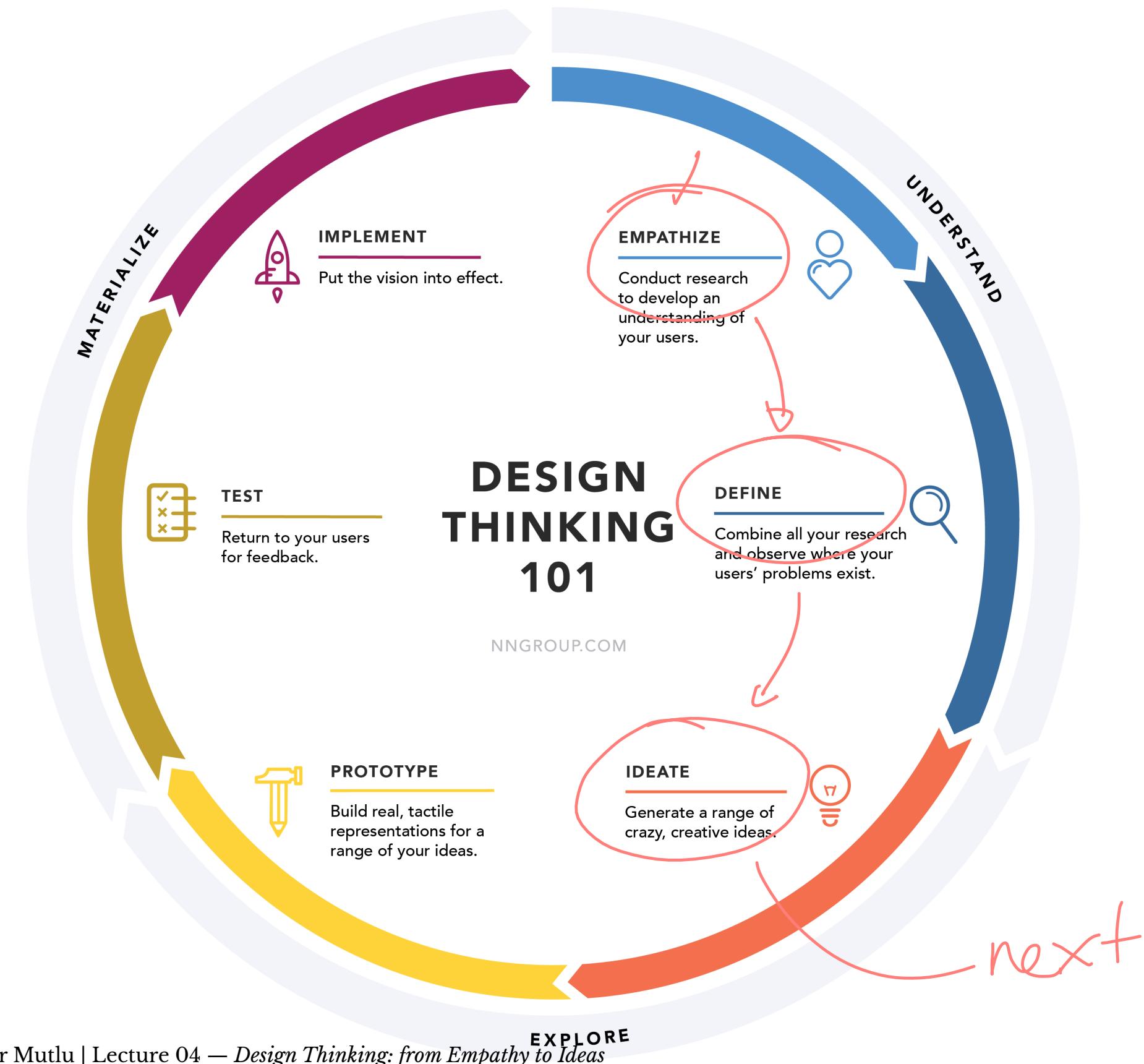
- Step 1: Start an initial set of categories
- Step 2: Sort notes into these categories
- Step 3: Add subcategories or consolidate categories as needed
- Step 4: Present each category
- Step 5: Rank categories in *severity*, combining

we
will
work
on this

voilà!

Your findings will serve as *design insight*.

from the affinity diagramming

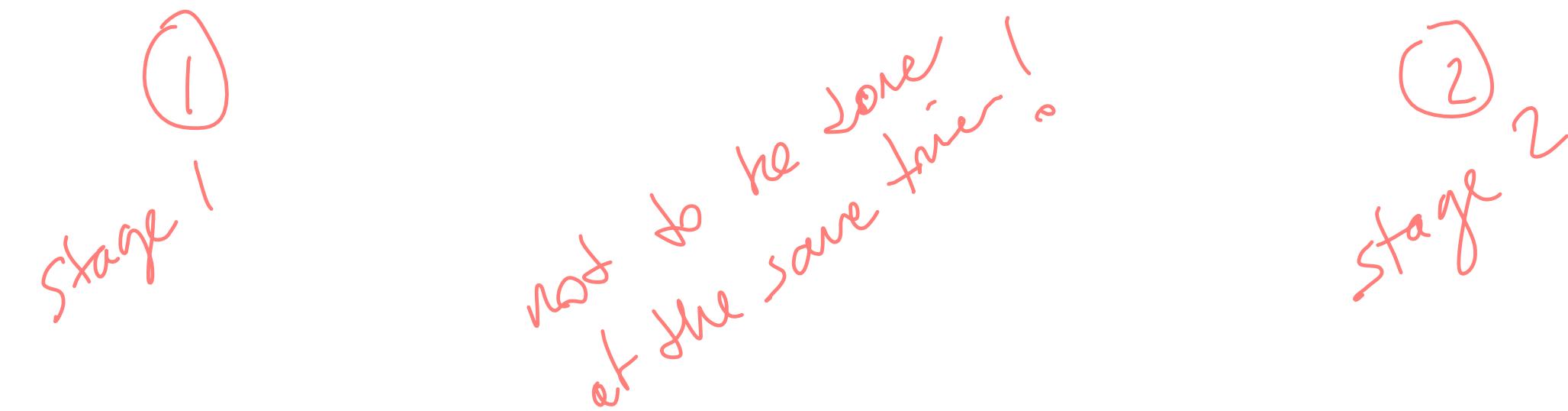


ideate

Definition: An active, creative, exploratory, highly iterative, fast-moving collaborative process for forming ideas for design.

Ideation can be done individually or collaboratively.

Ideation has two stages: Idea creation → Critiquing



Key considerations

- Workspace
- Team
- Process
- Rules of engagement ✓
- Method of capturing ideas

Image source⁹



⁹ [GlassDoor](#)

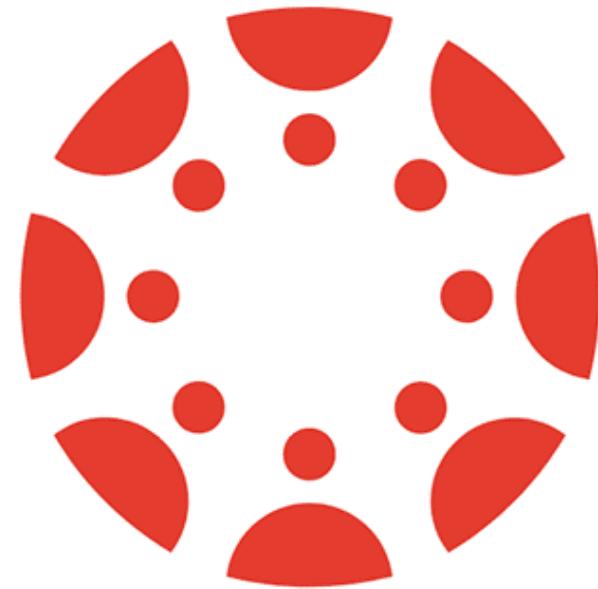
IDEO's Rules of Engagement

Well-known design firm

1. Defer judgement. ✓
2. Encourage wild ideas. ✓
3. Build on the ideas of others. ✓
4. Stay focused on the topic. ✓
5. One conversation at a time. ✓
6. Be visual. ✓
7. Go for quantity. ✓

Quiz 2

Complete the Canvas quiz.

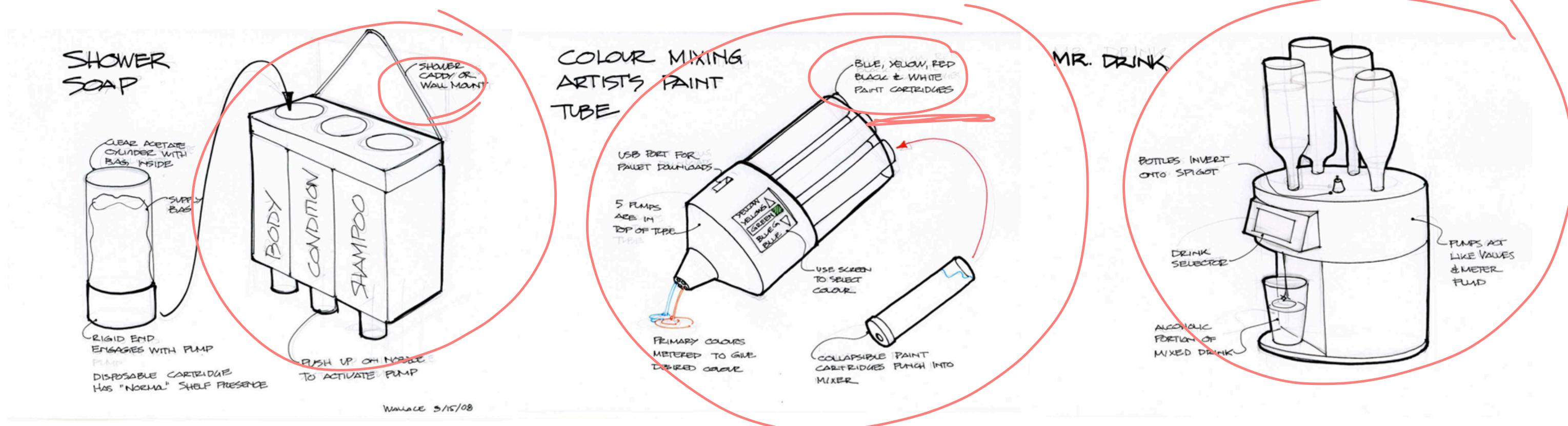


canvas

Ideation \rightleftarrows Sketching

Definition: A sketch is a quick and rough drawing that gives a general outline of an idea.¹⁰

(not detailed /not artistic)



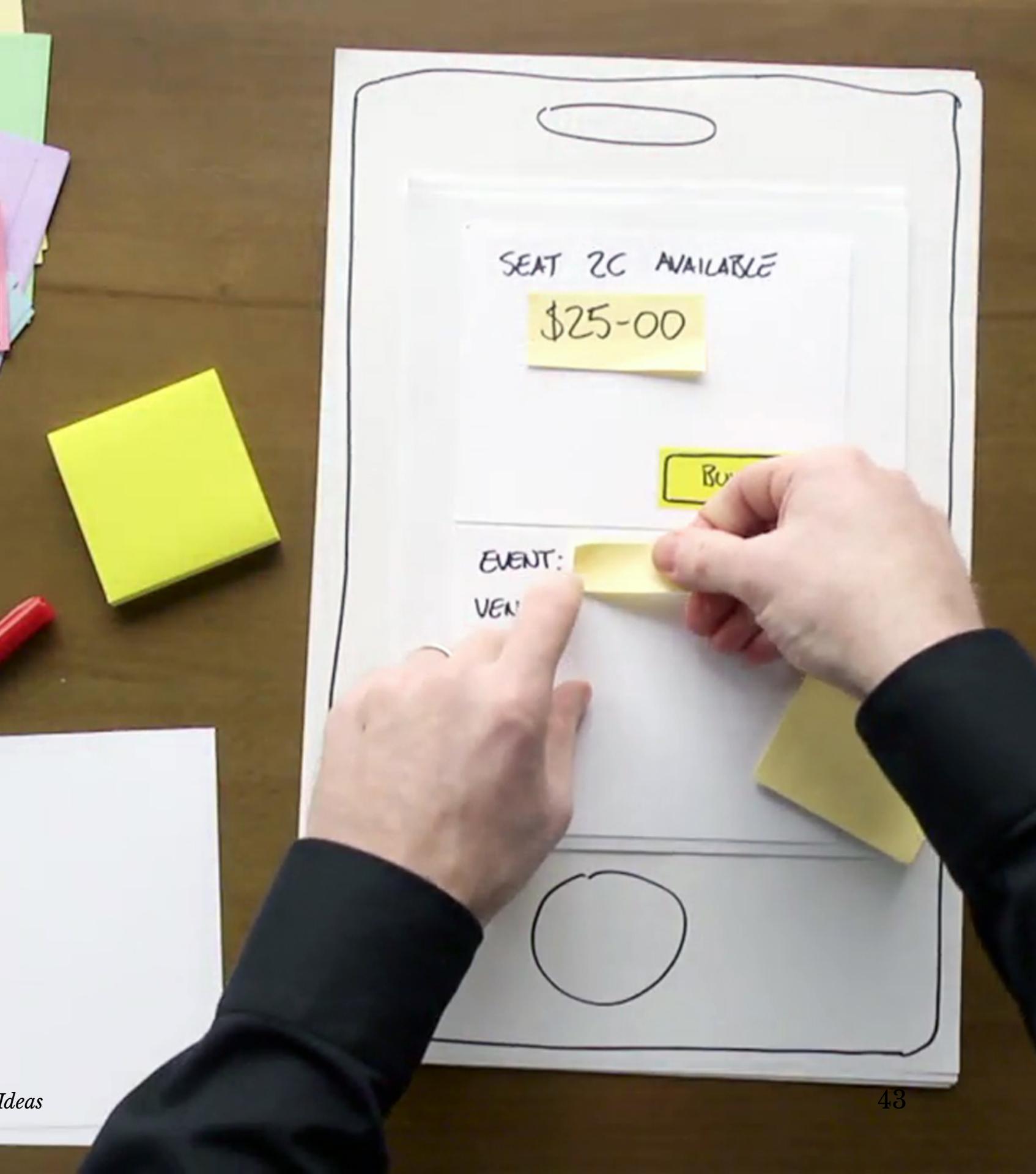
¹⁰ Idea sketch examples: [MIT 2.009](#)

Sketching Principles¹¹

If you can draw this, you can sketch → 

- Everyone can sketch
- Sketching is more effective than words for most ideas
- Quick and inexpensive sketches do not inhibit exploration
- Sketches are disposable

otherwise you get attached ideas

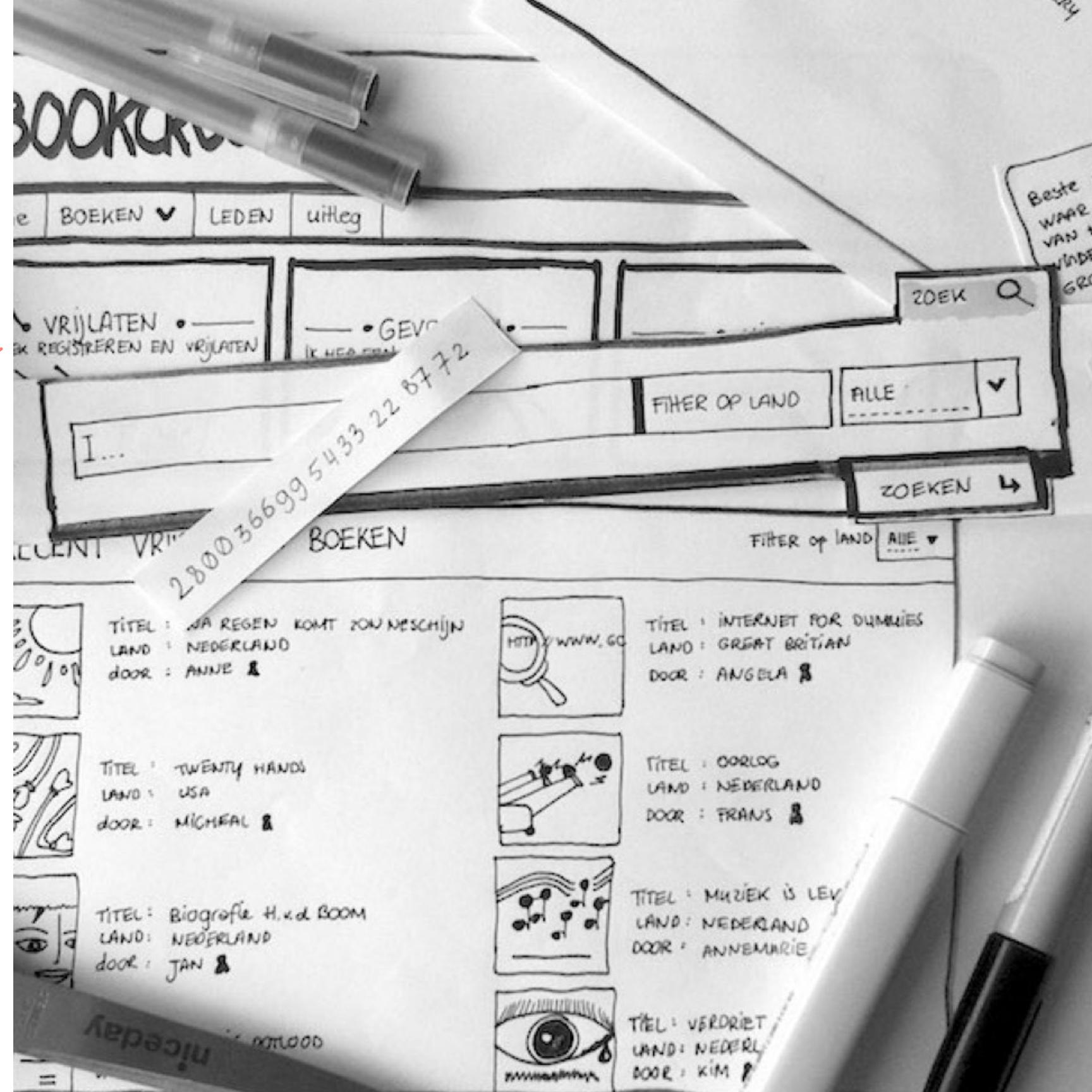


¹¹ Buxton, 2007

Sketching Principles¹² Continued

- Sketches are made just-in-time, in-the-moment, when needed
- Sketches should be plentiful, entertain a large number of ideas, and include multiple sketches of each idea
- Textual annotations can explain what is going on in the sketch

very useful



¹² Buxton, 2007

Sketching can do more!¹³

¹³ Medium

*Different uses
of sketching*

UX Knowledge Base Sketch #52

SKETCHING

FOR UX DESIGNERS

TOOLS: JUST GRAB THE NEAREST PEN & PAPER!

IN CASE OF USER INTERFACES:
VARY THE FIDELITY /
DETAIL LEVEL BASED ON
YOUR GOAL
(DELIVERABLE?
QUICK CONCEPT?) YOUR AUDIENCE
(CLIENT? TEAM?
YOURSELF?)

YOU CAN DRAW,
IT IS NOT ABOUT
BEING ARTISTIC!

JUST START IT, YOU'LL
BECOME MORE CONFIDENT
OVER TIME!

① FACILITATING MEETINGS &
DESIGN WORKSHOPS,
PROJECT PLANNING

② WIREFRAMING
DON'T FORGET:
ANNOTATIONS ARE GREAT!

③ PAPER PROTOTYPING -
VALIDATING IDEAS,
TESTING OUT CONCEPTS

④ IDEATION
QUICK IDEA GENERATION
(E.G. DURING A DESIGN SPRINT,
OR JUST ON YOUR OWN)

⑤ TEAMWORK, ANY KIND OF
COLLABORATION
(E.G.: "TALKING SKETCHES")

⑥ USER FLOWS
SITEMAPS
INFORMATION ARCHITECTURE

⑦ MAPPING: EMPATHY MAP,
JOURNEY MAP,
PRODUCT ROADMAP ETC.

⑧ UI ANIMATIONS
WHAT CHANGES, HOW,
WHAT THE TRIGGER IS

⑨ STORYBOARDING
VALIDATING
ASSUMPTIONS

⑩ APPLYING ICONS, VISUALS
IN UX RESEARCH NOTES
(E.G. USER INTERVIEW,
CONTEXTUAL INQUIRY)

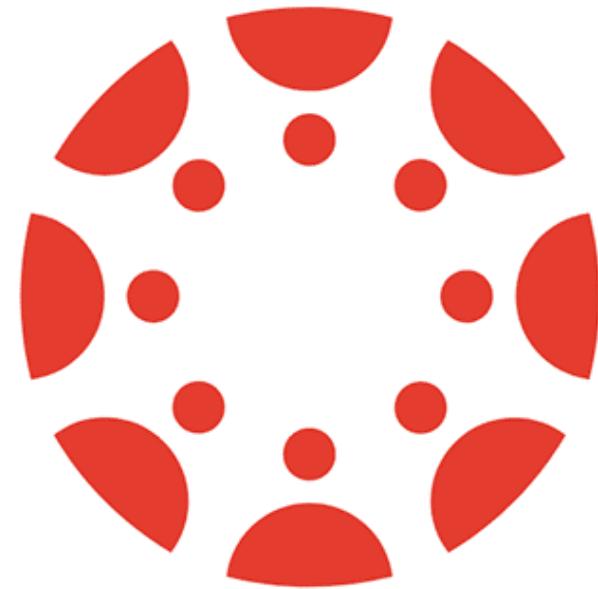
⑪ DOCUMENTATION,
PRESENTATION
TO CLARIFY &
TO MAKE IT MORE ENGAGING

⑫ SKETCHNOTING
- CONFERENCE TALKS
- BOOKS
- MEETINGS

CREATED BY KRISTINA SEEROVAY
www.sketchingformx.com

Quiz 3

Complete the Canvas quiz.



canvas

In ideation, sketches illustrate *conceptual designs*.

What is Conceptual Design?

Definition: An abstract characterization of the context, use, or experience with an envisioned design solution that highlights the main premise of the solution.

Storyboarding

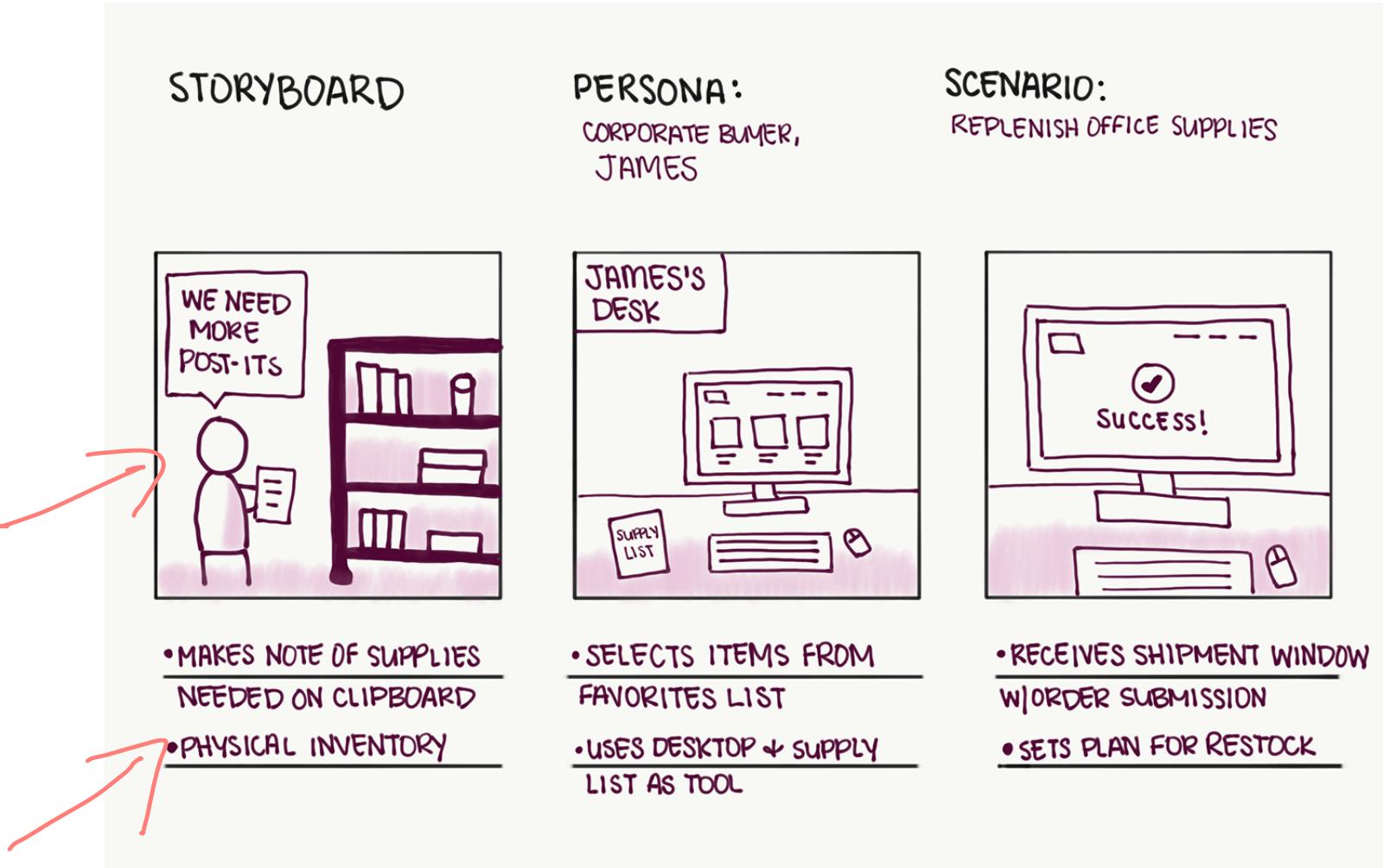
Definition: A sequence of visual frames that illustrate user interaction with the envisioned system, capturing social, environmental, and technical factors that shape user experience.

Source¹⁴

usually
3-6 frames

Context

Description



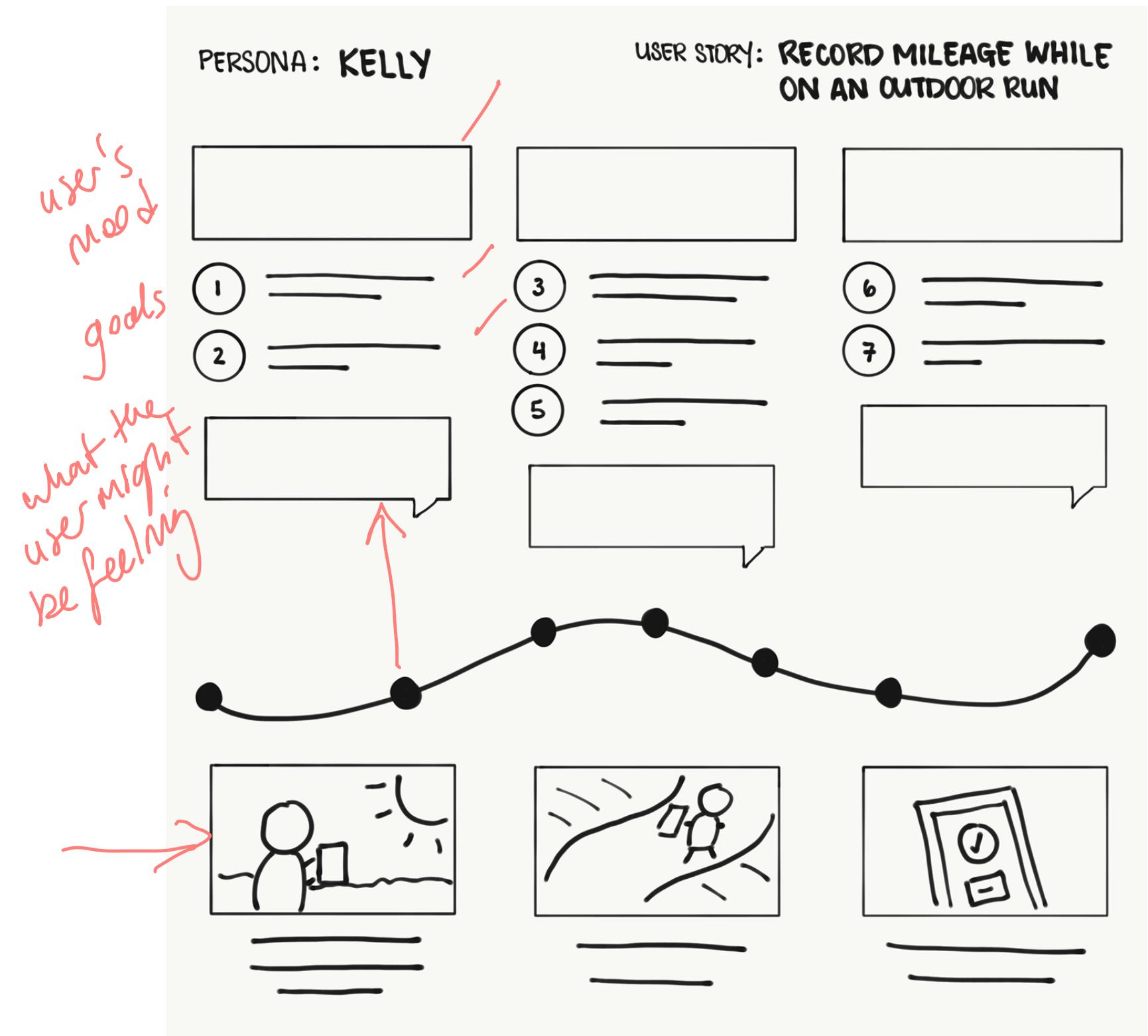
¹⁴ NN/g: Storyboards Help Visualize UX Ideas

Journey Maps

Definition: A visualization of the process that a person goes through in order to accomplish a goal.

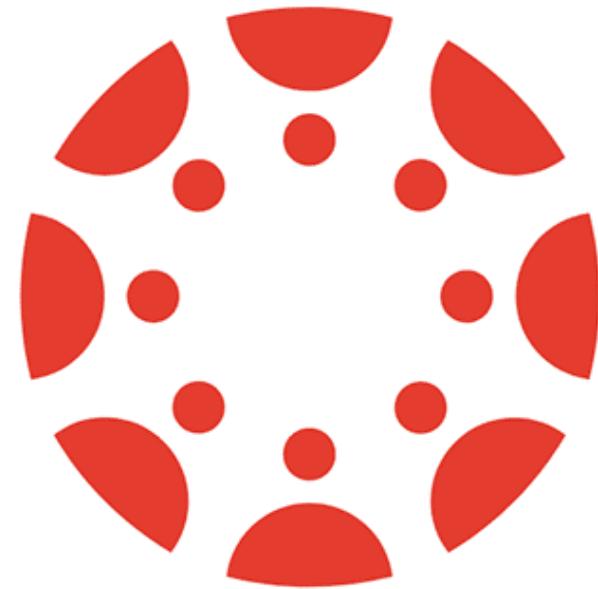
User actions, thoughts, and emotions mapped onto a timeline to create a narrative.

Source¹⁵



Quiz 4

Complete the Canvas quiz.



canvas

What did we learn today?

- Design thinking and process
- Step 1: How to empathize with users
- Step 2: How to turn data into insight
- Step 3: How to generate design ideas
- Sketching, conceptual design, storyboarding

What's next?

- Next lecture on *Visual Design* on Wednesday
- *Javascript β* will be released Wednesday at 4 pm