

# Building User Interfaces

# Design Thinking

## from Empathy to Ideas

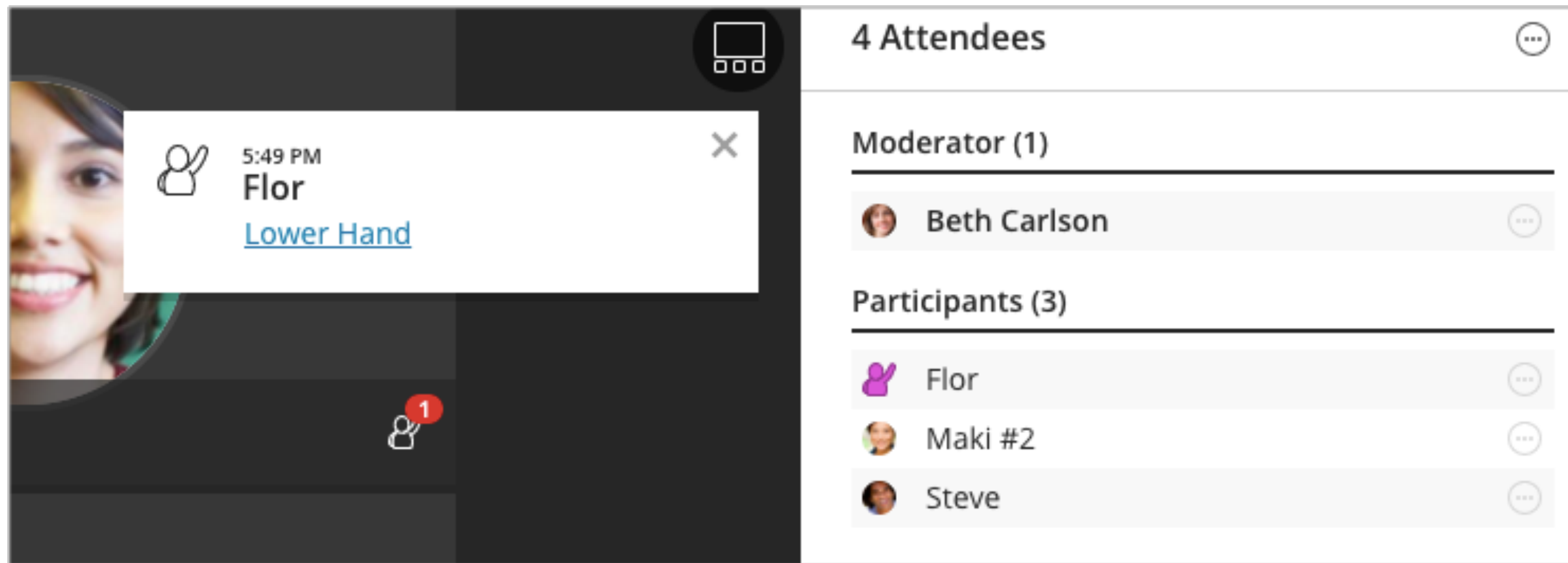
## Professor Bilge Mutlu

# 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*?





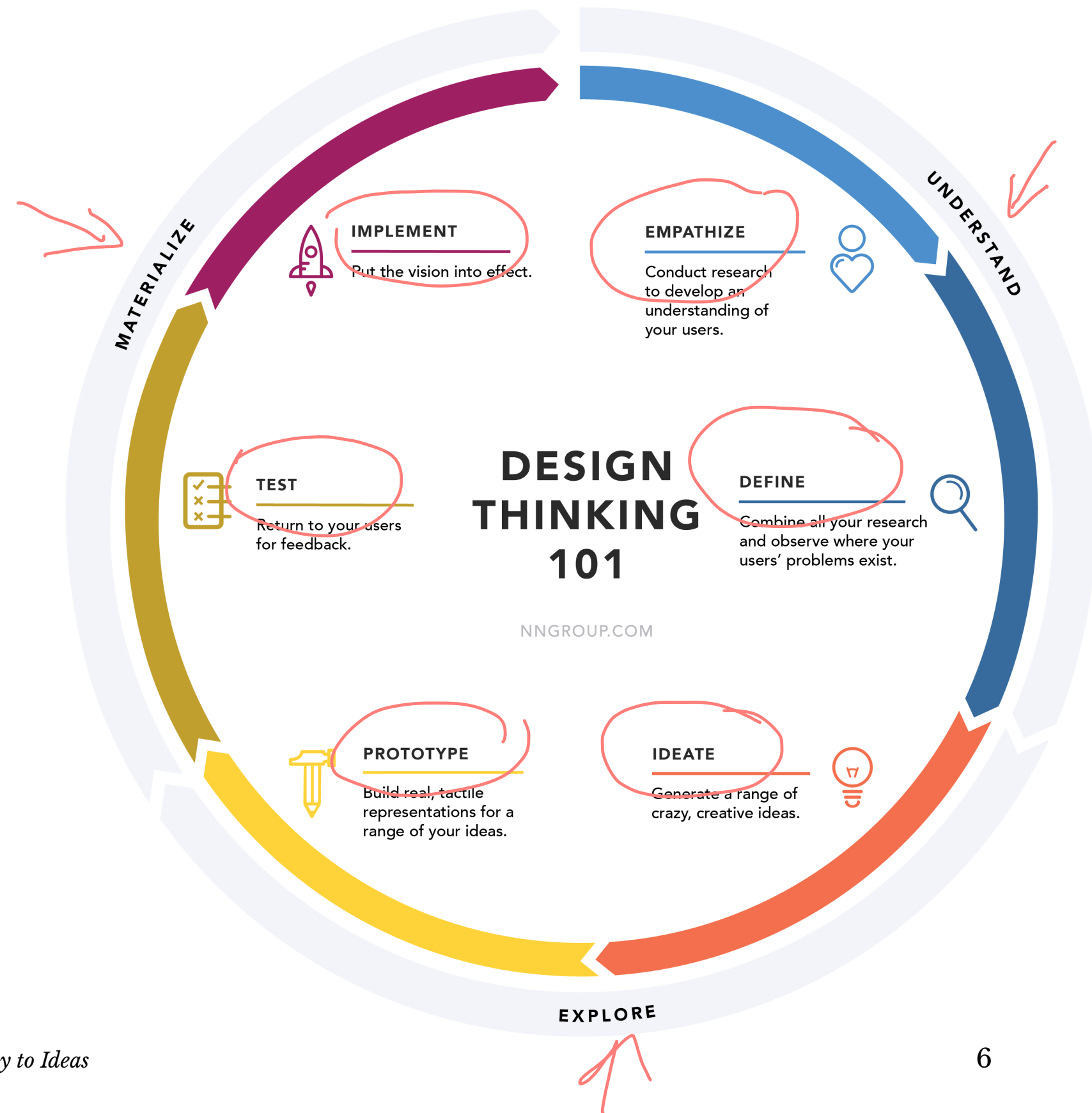
**NN/g**

# Design Thinking 101

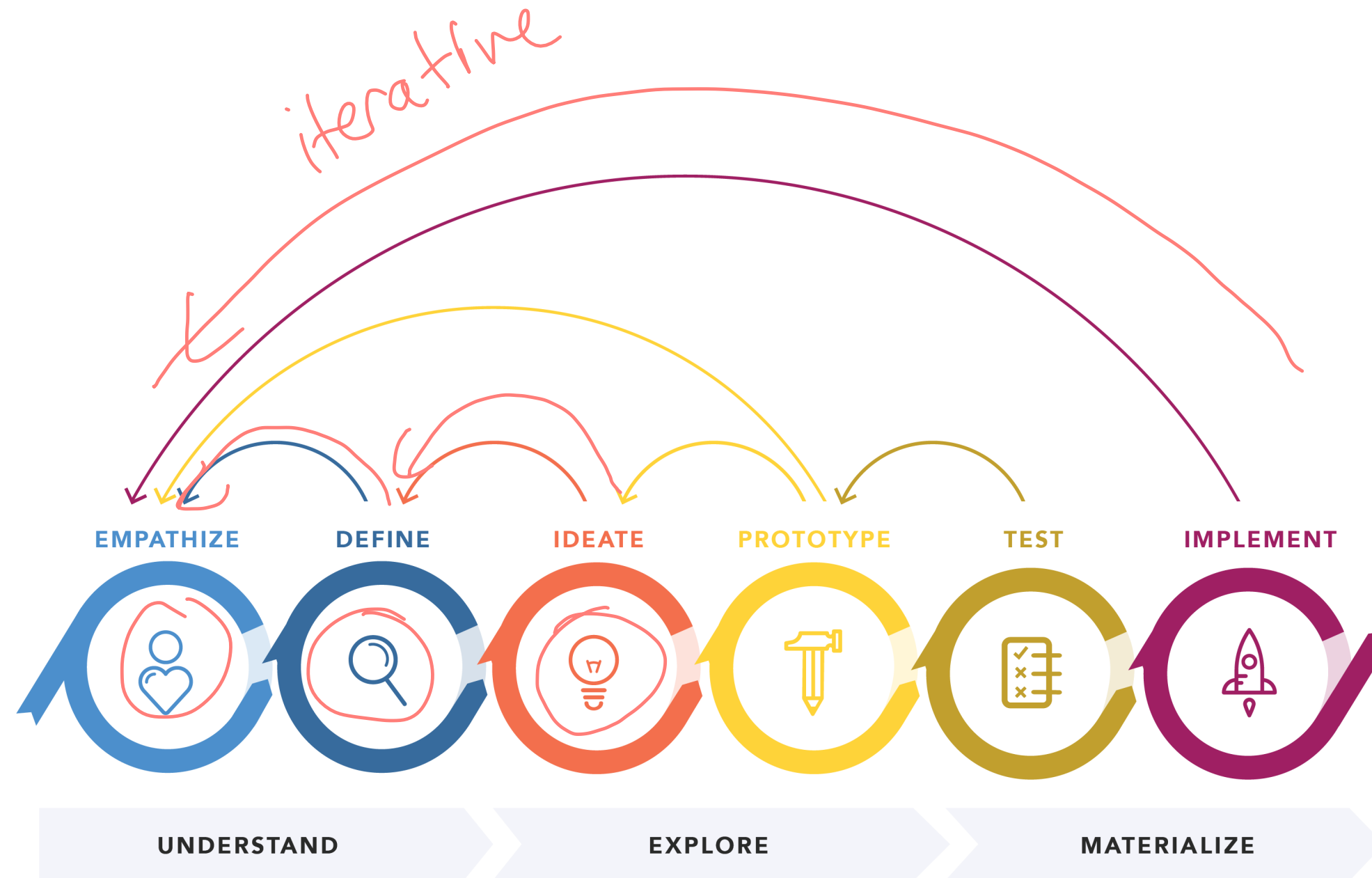
*Design thinking* has two components:

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

Source<sup>2</sup>



<sup>2</sup> NN/g Design Thinking



DESIGN THINKING 101 [NNGROUP.COM](https://www.nngroup.com)

### <sup>3</sup> NN/g Design Thinking

# Takeaways

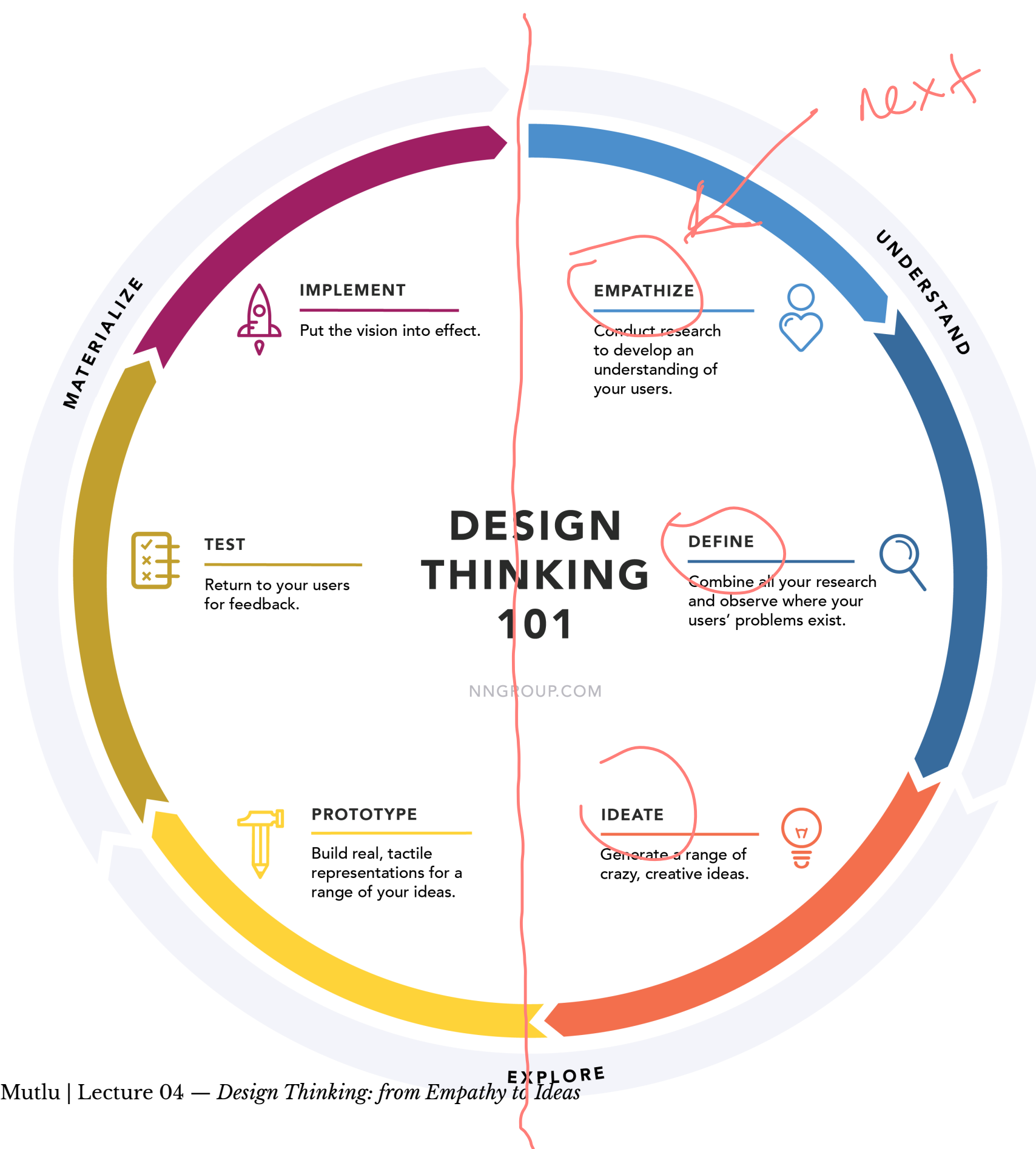
1. Approach problems like a designer ✓
2. Follow a process ✓

# Quiz 1

Complete the Canvas quiz.



canvas



we'll cover  
this half  
today

# Empathize

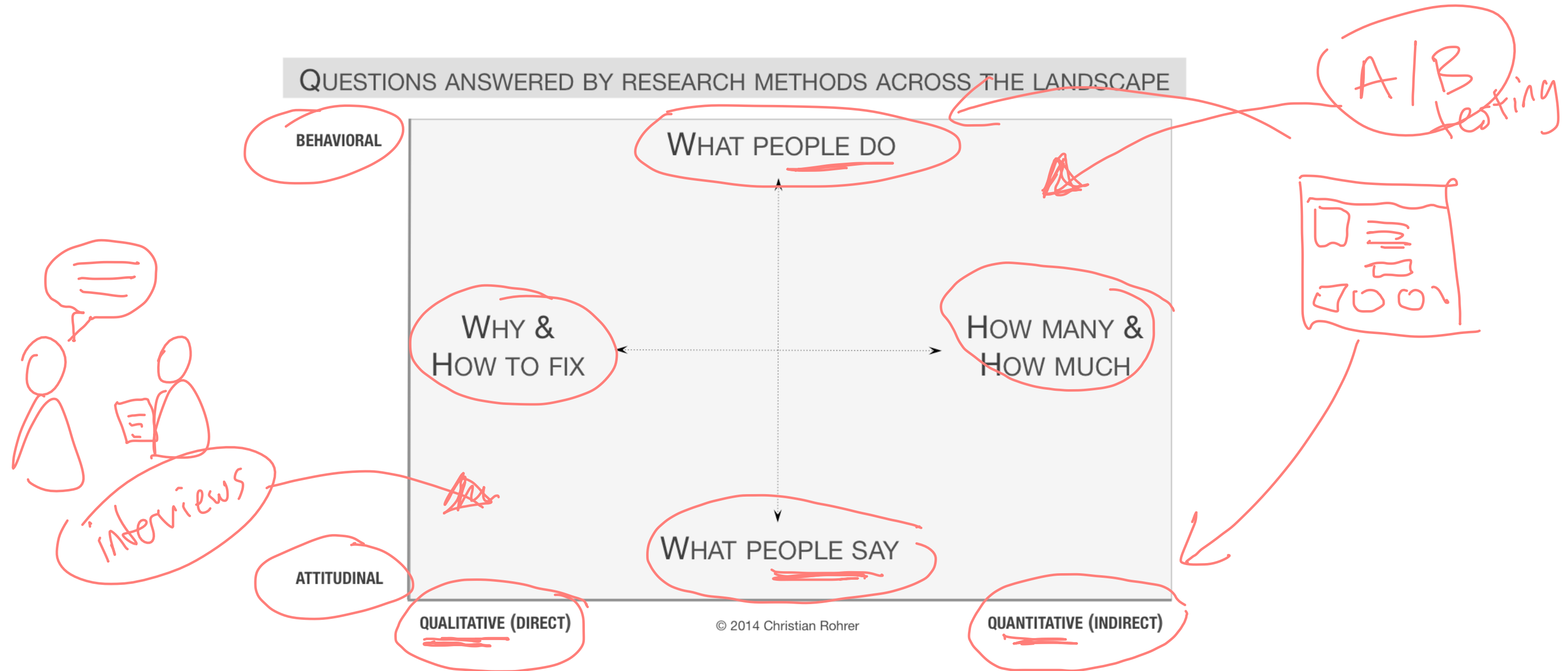
(aka User Research)

# 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.





#### <sup>4</sup> NN/g UX Research Methods

The simplest and most powerful method for empathy:

# Think-alouds

"The #1 Usability Tool" — Jakob Nielsen

Source<sup>5</sup>



<sup>5</sup>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 ✓

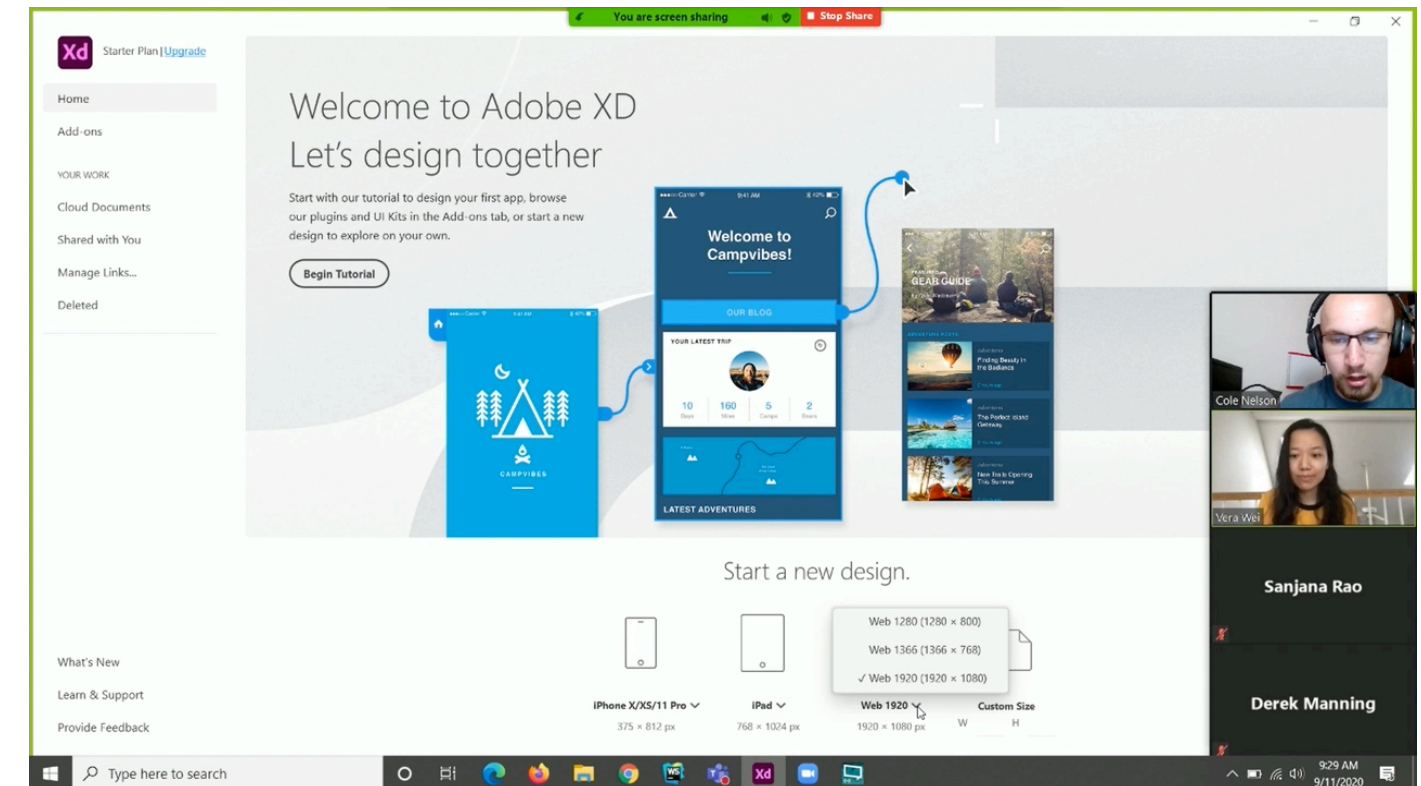




# In-class Activity: *Adobe XD*

# In-class Activity: Part I — *the think-aloud*

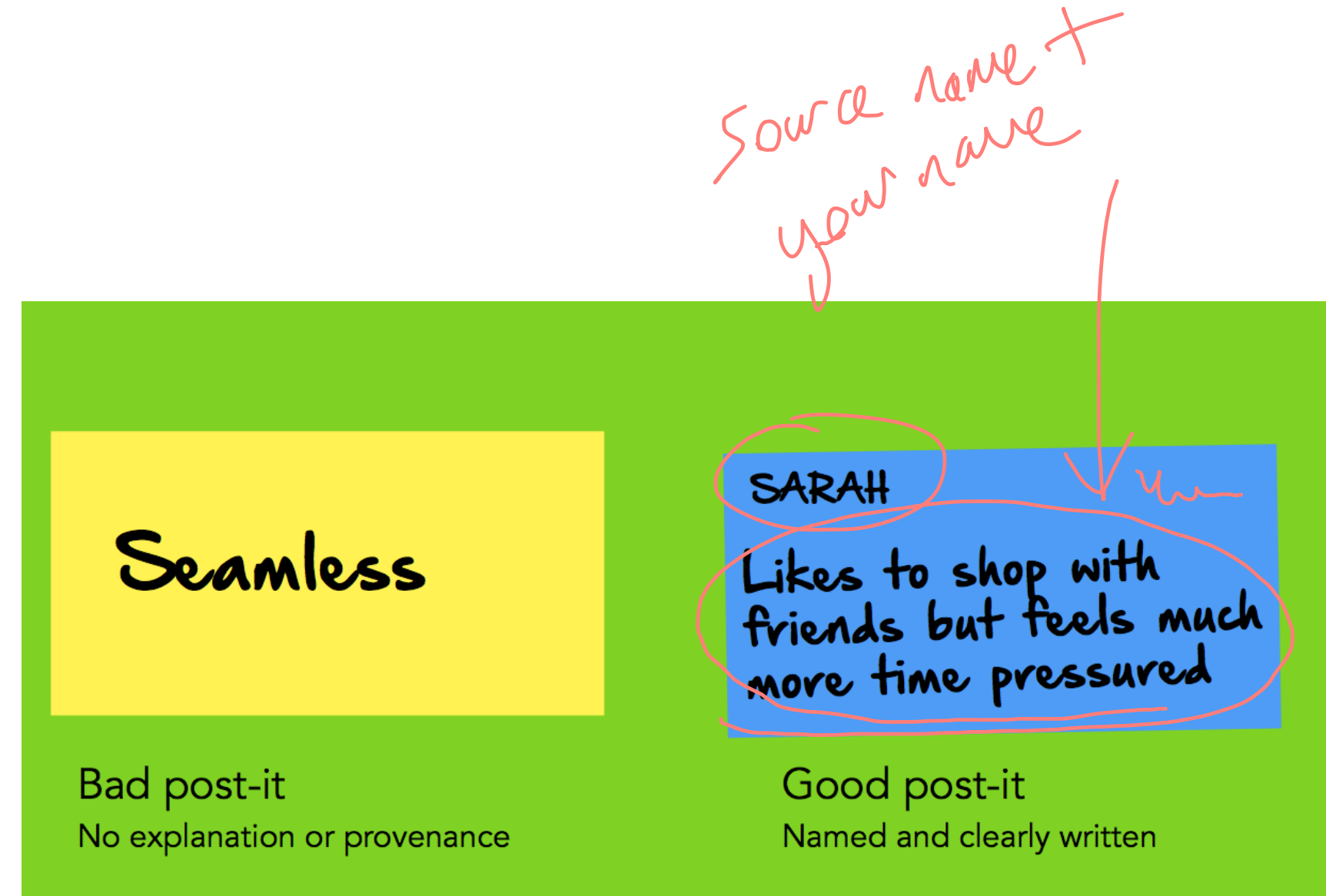
We will watch a 10-minute video of a *think-aloud session* with a novice user performing a set of tasks in Adobe XD.



# What **you** should do<sup>6</sup>

**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.



<sup>6</sup> Cooper-Wright

# Think-aloud Tasks

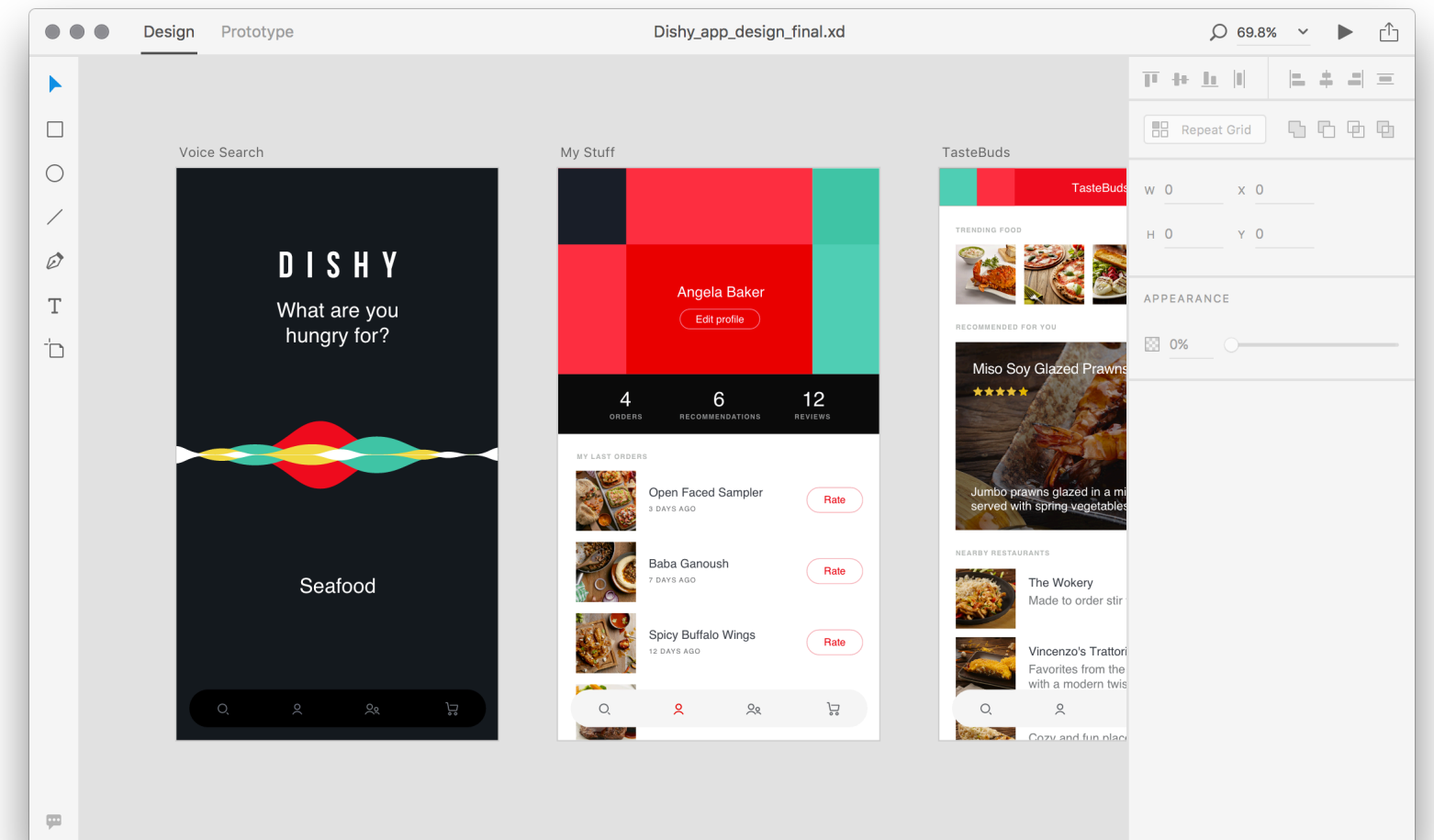
**Task 1:** Start a new design for the web at size 800 x 600.

**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...

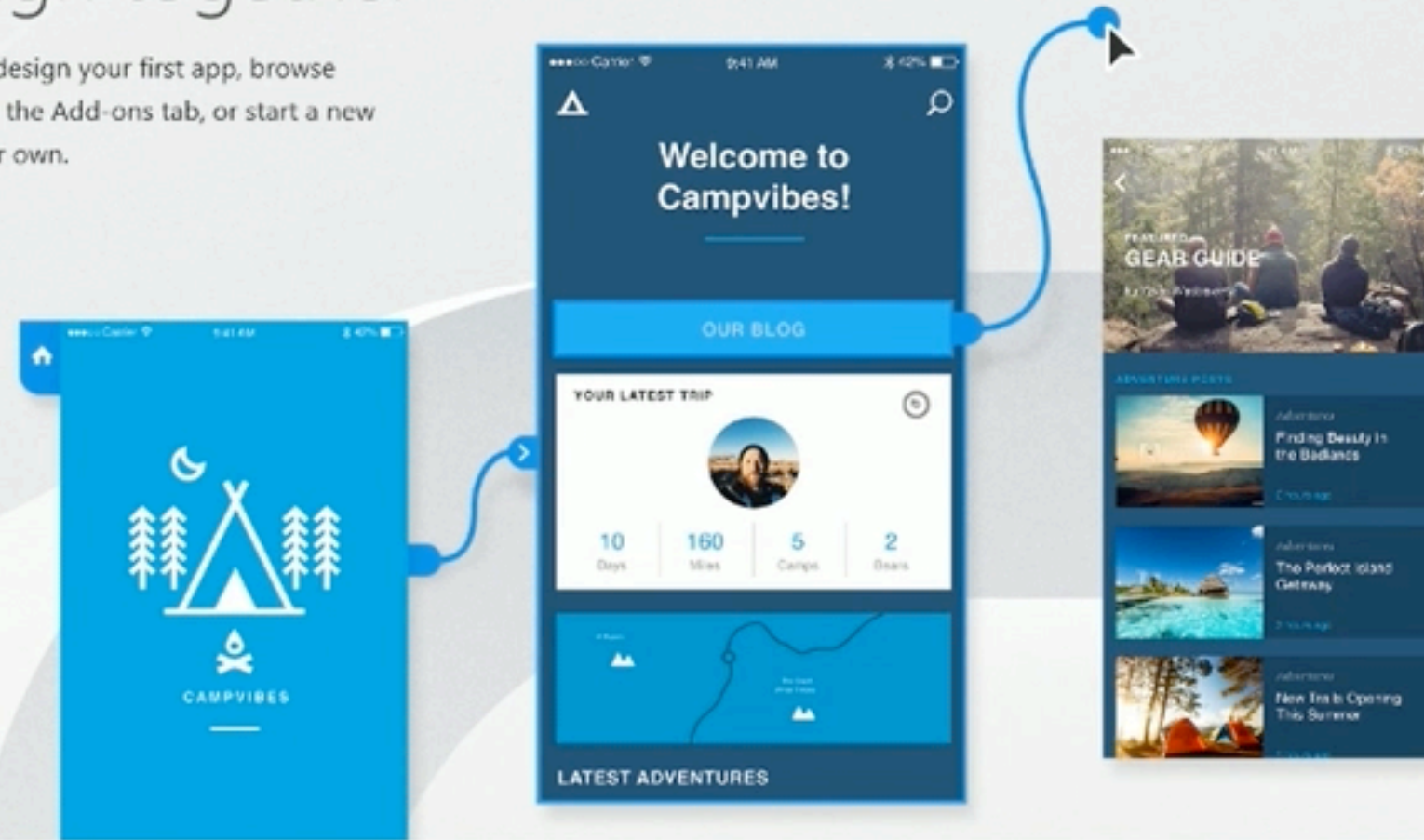
Deleted

# 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.



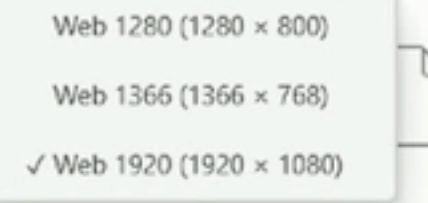
iPhone X/XS/11 Pro

375 × 812 px



iPad

768 × 1024 px



Web 1920

1920 × 1080 px

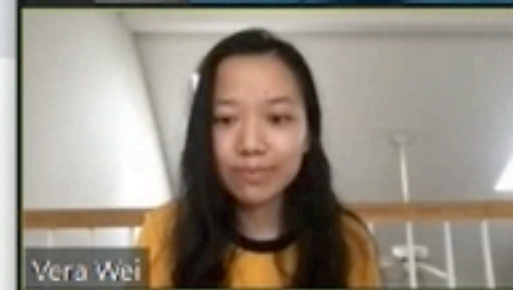
Custom Size

W H

What's New

Learn & Support

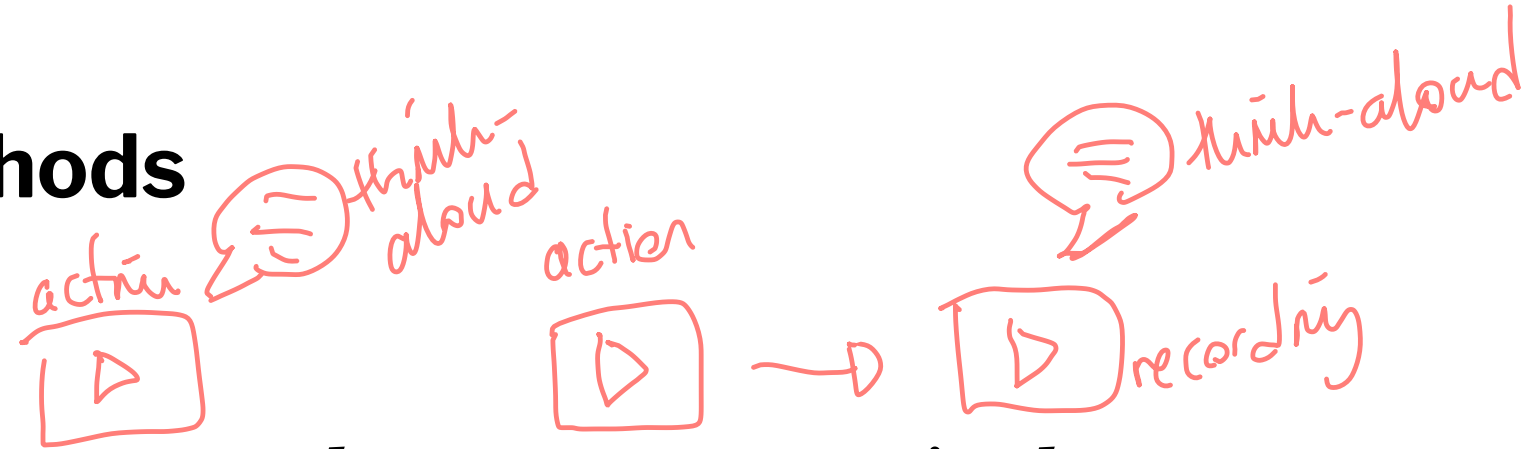
Provide Feedback



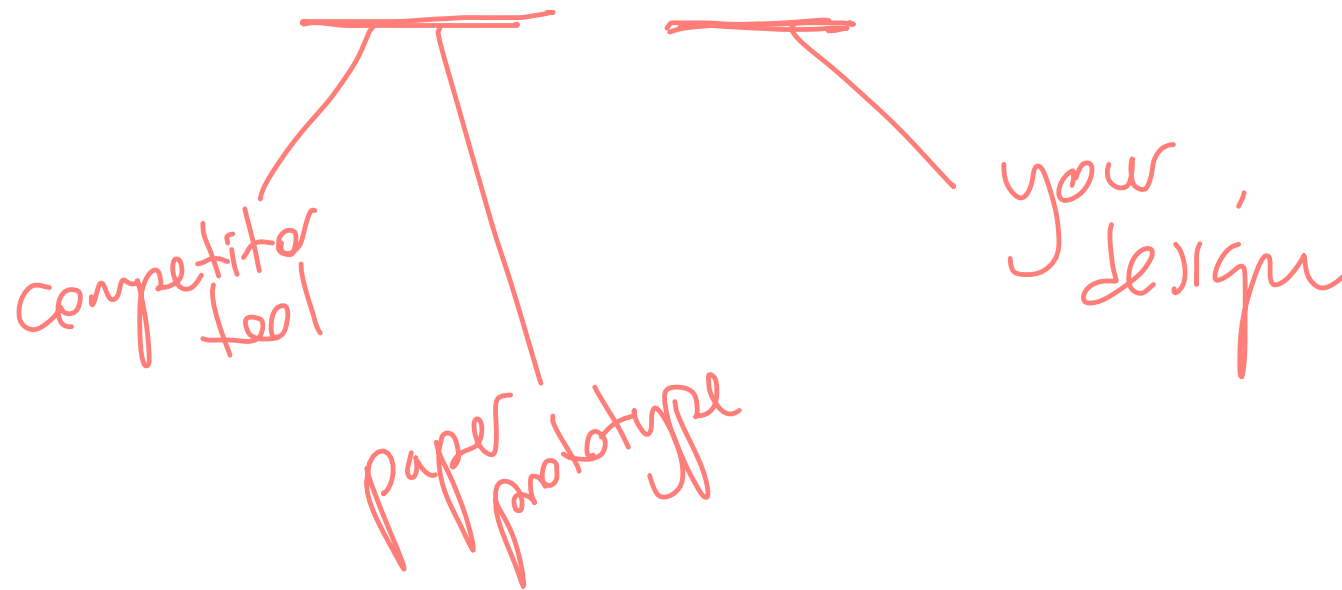
Sanjana Rao

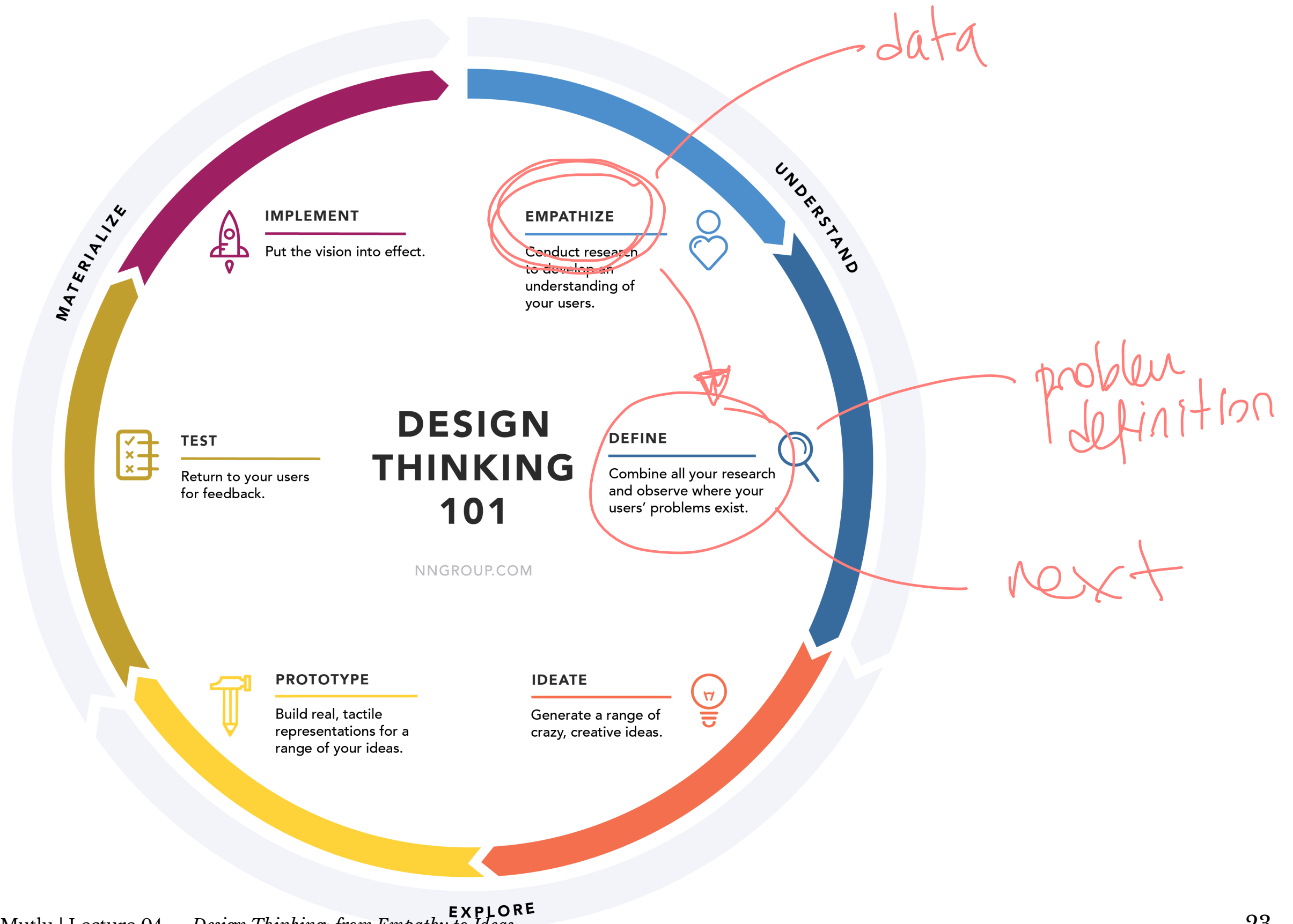
Derek Manning

## 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?

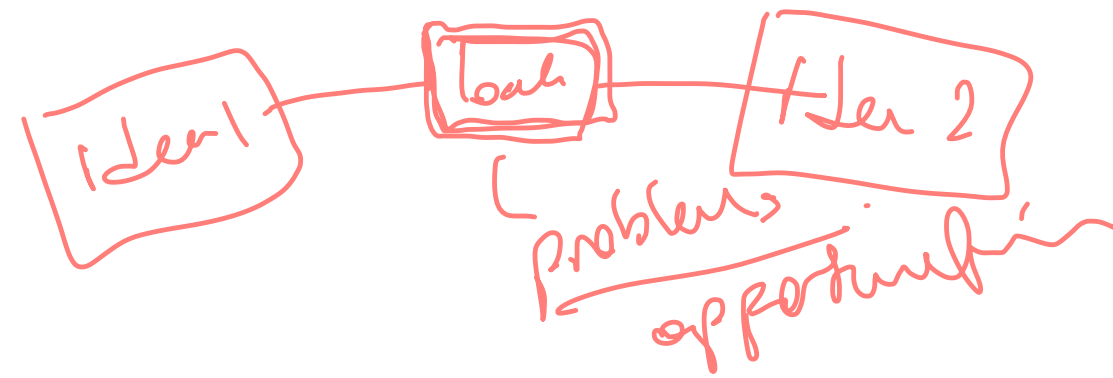
- Gathering all findings — **gather** ✓
- Consolidating, categorizing, distilling — **analyze** ✓
- Translate into insight — **recommend** ✓

## But how do we go about this?

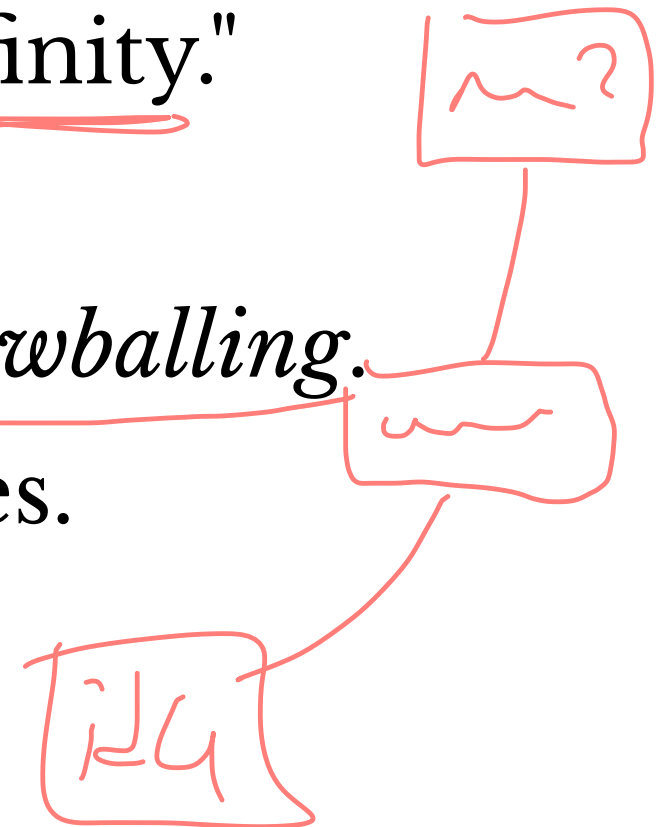
- Again, there are many methods for analysis.
- The simplest and most powerful method is *affinity diagramming*.

# 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.







## <sup>7</sup> NN/g Affinity Diagramming

NNGROUP.COM **NN/g**

# How do we go about it?

- 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 importance, prevalence, frequency

iterative

three components

②

③

①



# How do we go about it?

## Continued.<sup>8</sup>

*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

<sup>8</sup>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

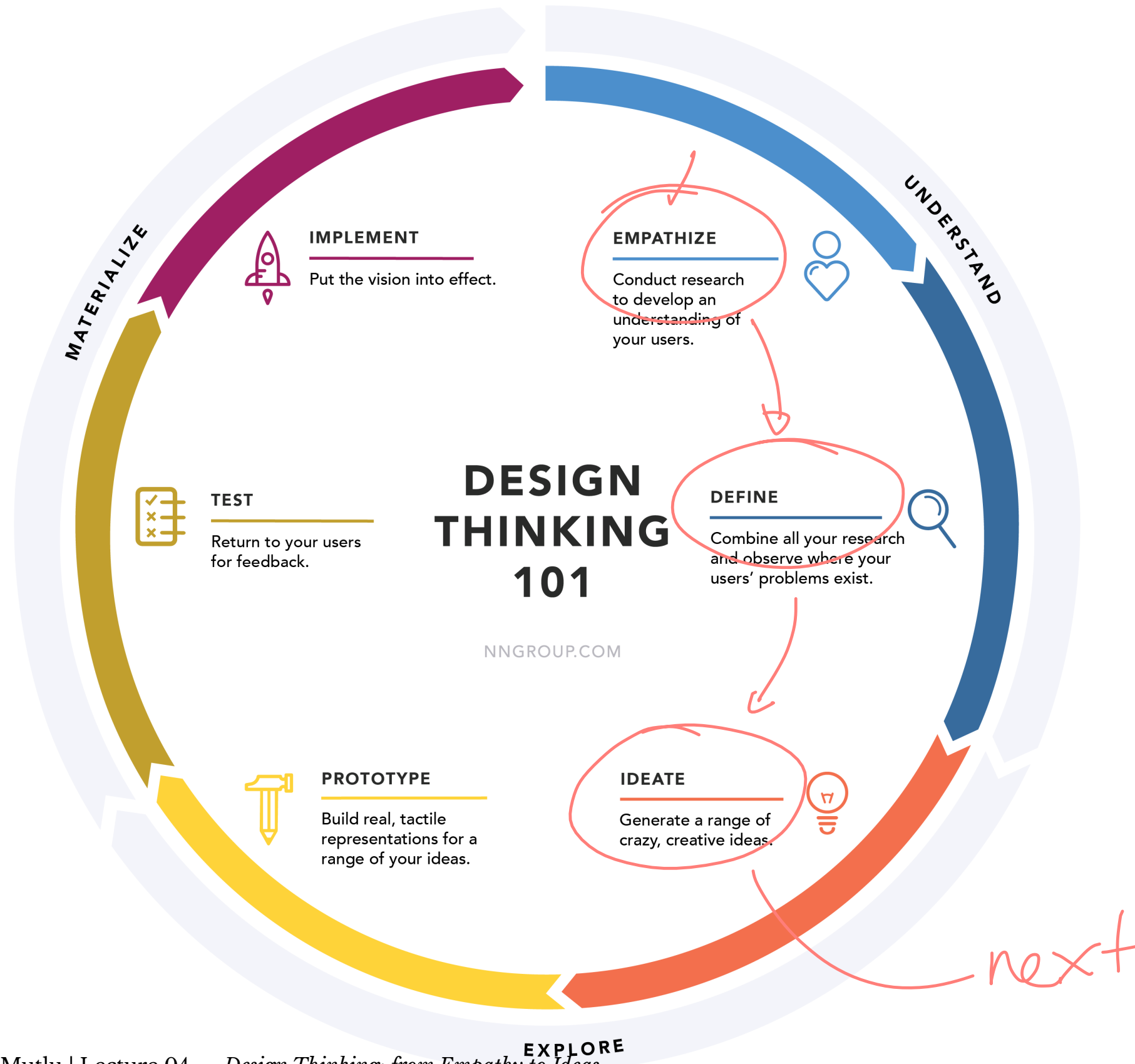
*we won't  
do this*

# 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

①  
stage 1

not to be done  
at the same time!

②  
stage 2

# Key considerations

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

Image source<sup>9</sup>

<sup>9</sup>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.

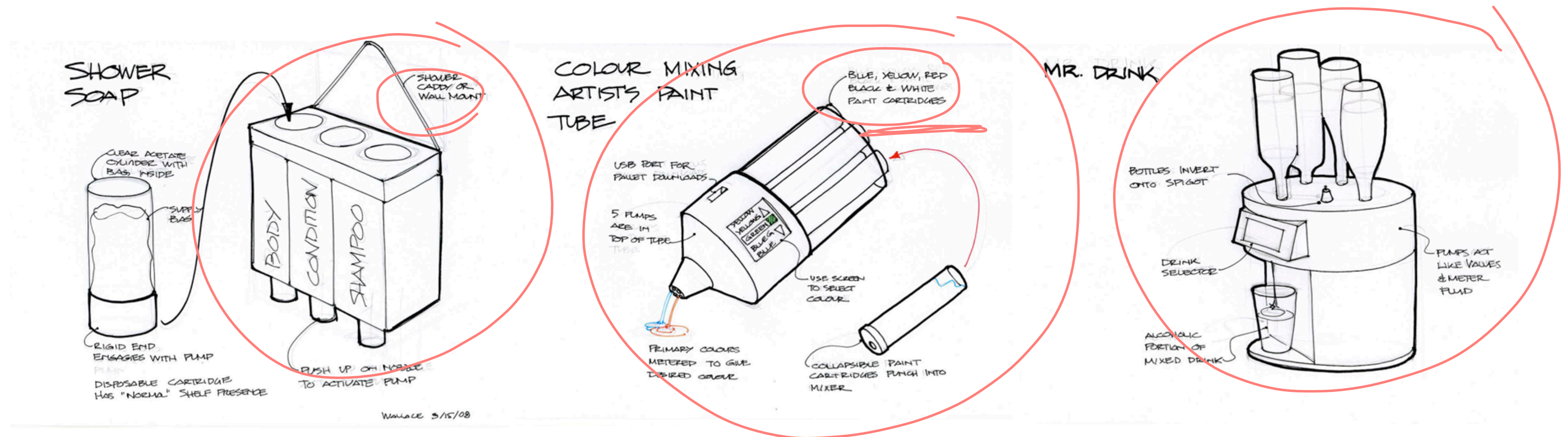


canvas

# Ideation $\rightleftharpoons$ Sketching



**Definition:** A sketch is a quick and rough drawing that gives a general outline of an idea.<sup>10</sup> *(not detailed / not artistic)*



<sup>10</sup> Idea sketch examples: MIT 2.009

# Sketching Principles<sup>11</sup>

- 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 to ideas

<sup>11</sup> Buxton, 2007



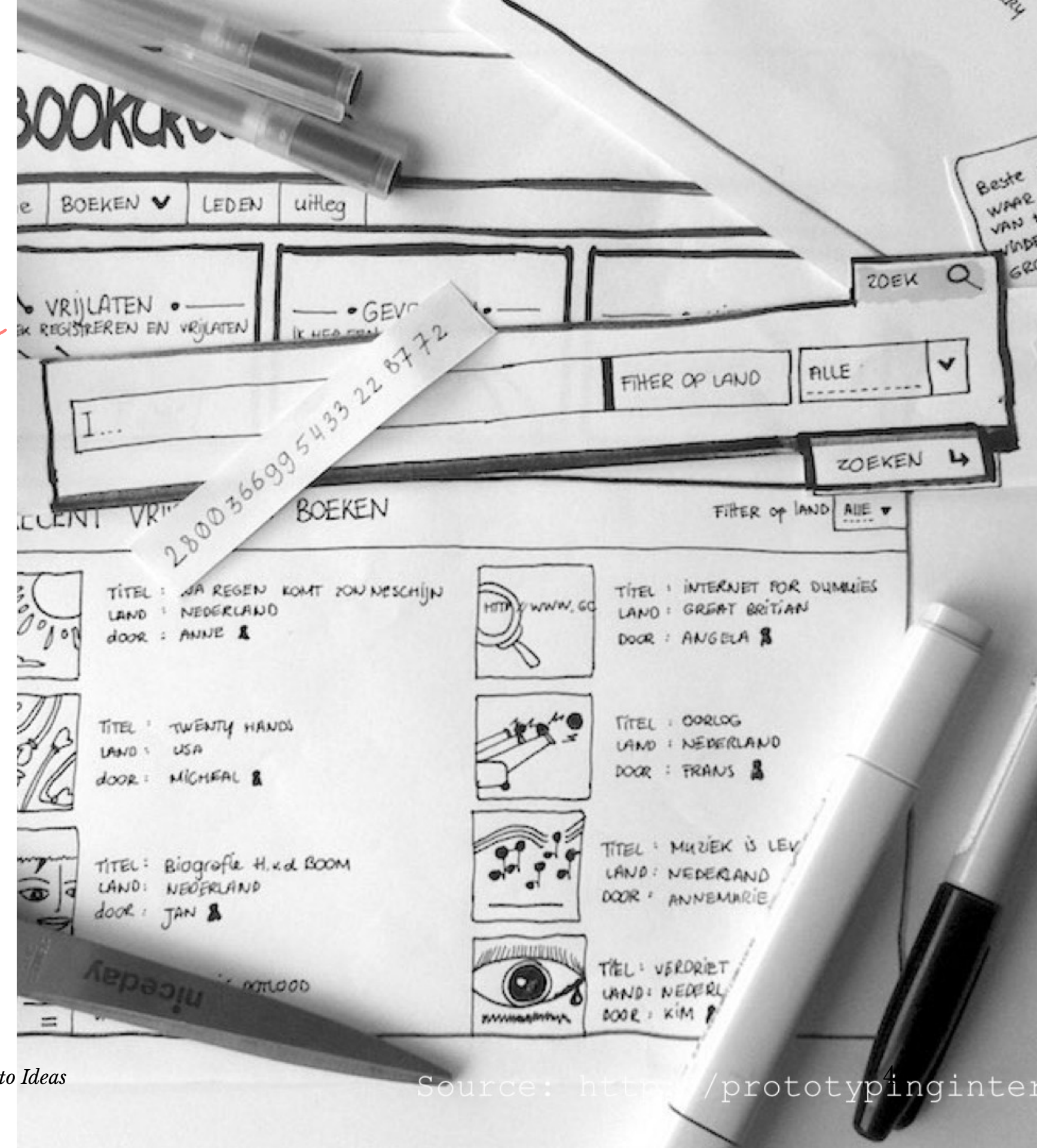


## Sketching Principles<sup>12</sup> Continued

- 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

<sup>12</sup> Buxton, 2007



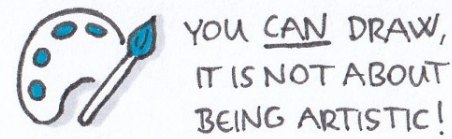


# Sketching can do more!<sup>13</sup>

<sup>13</sup> Medium



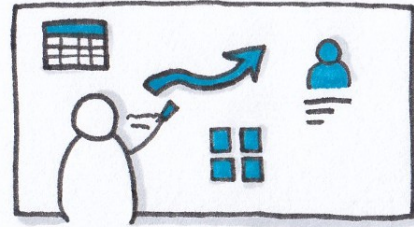
different uses of sketching



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

# SKETCHING

FOR UX DESIGNERS

UX Knowledge Base Sketch #52

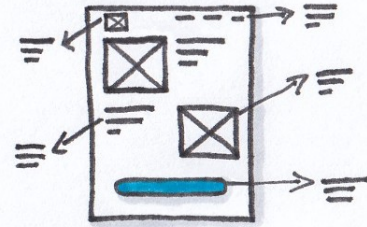
TOOLS:  
JUST GRAB THE NEAREST  
PEN & PAPER!



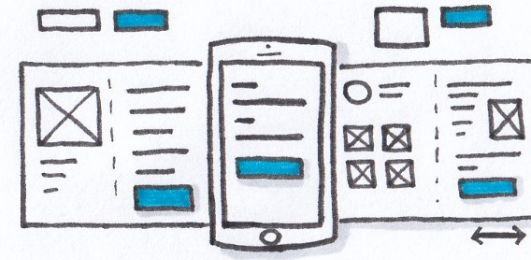
IN CASE OF USER INTERFACES:  
VARY THE FIDELITY/  
DETAIL LEVEL BASED ON

YOUR GOAL  
(DELIVERABLE?  
QUICK CONCEPT?)

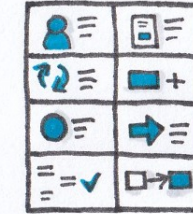
YOUR AUDIENCE  
(CLIENT? TEAM?  
YOURSELF?)



② WIREFRAMING  
DON'T FORGET:  
ANNOTATIONS ARE GREAT!



③ PAPER PROTOTYPING -  
VALIDATING IDEAS,  
TESTING OUT CONCEPTS

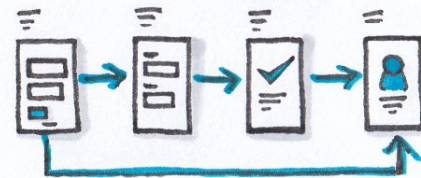


④ IDEATION  
QUICK IDEA GENERATION  
(E.G. DURING A DESIGN SPRINT,  
OR JUST ON YOUR OWN)

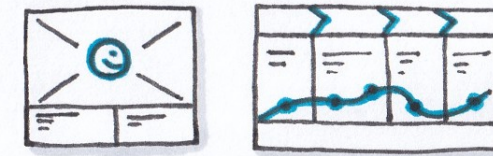


SHARED  
UNDERSTANDING!

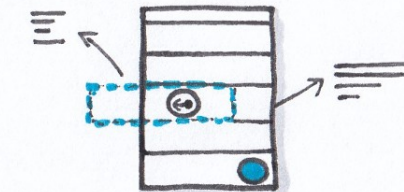
⑤ TEAMWORK, ANY KIND OF  
COLLABORATION  
(E.G.: "TALKING SKETCHES")



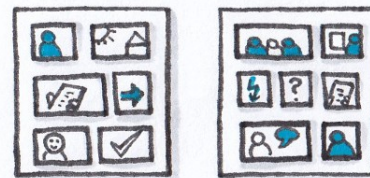
⑥ USER FLOWS  
SITEMAPS  
INFORMATION ARCHITECTURE



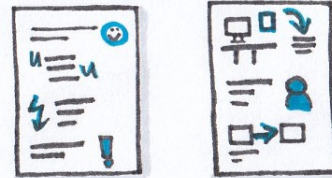
⑦ MAPPING: EMPATHY MAP,  
JOURNEY MAP,  
PRODUCT ROADMAP ETC.



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



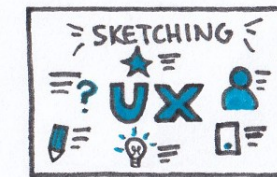
⑨ STORYBOARDING  
VALIDATING  
ASSUMPTIONS



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 SZERONAY  
WWW.SKETCHINGFORUX.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.

*key aspect*

# Storyboarding

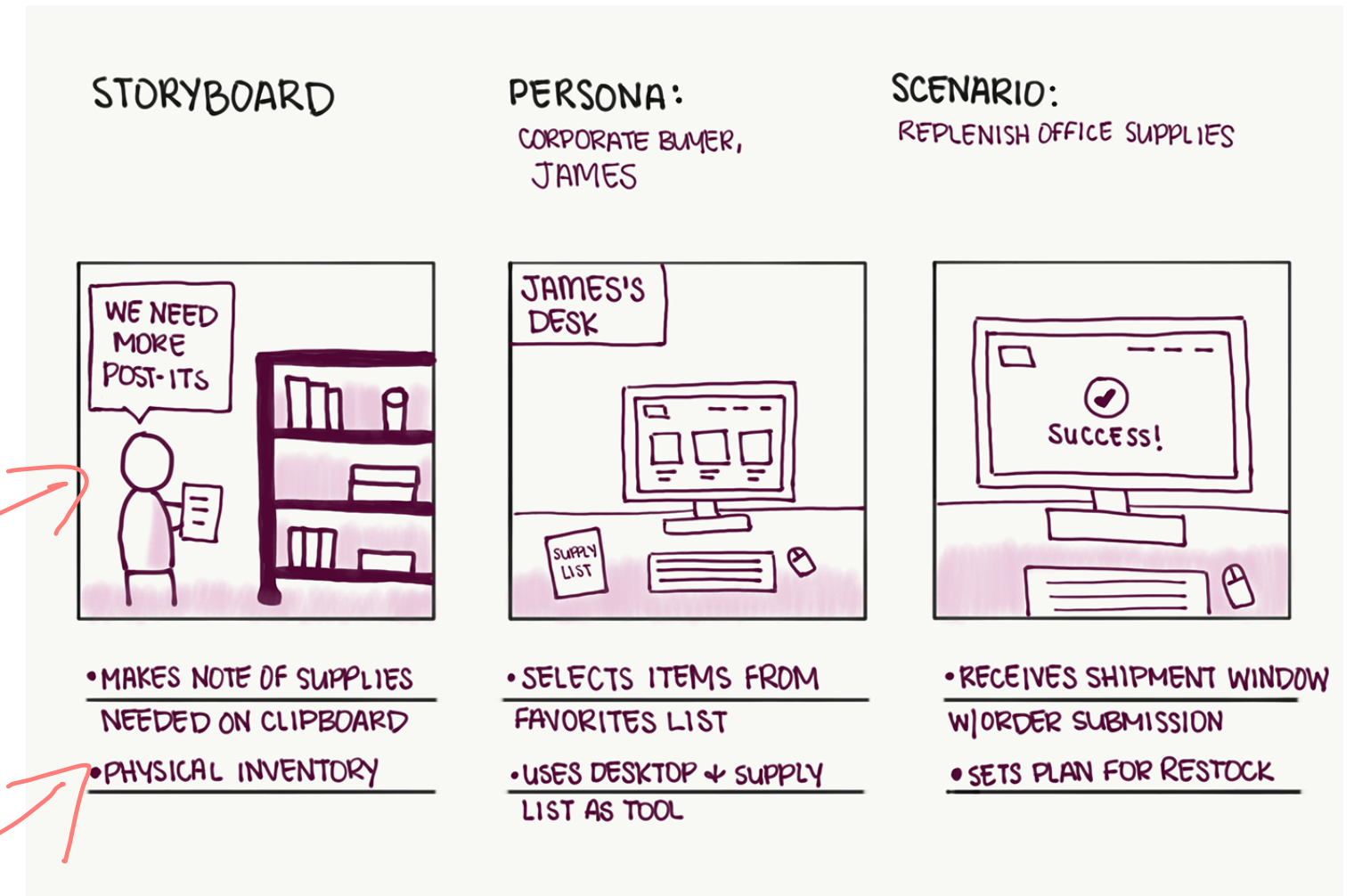
**Definition:** A sequence of visual frames that illustrate user interaction with the envisioned system, capturing social, environmental, and technical factors that shape user experience.

Source<sup>14</sup>

usually  
3-6 frames

context

description



<sup>14</sup> NN/g: Storyboards Help Visualize UX Ideas

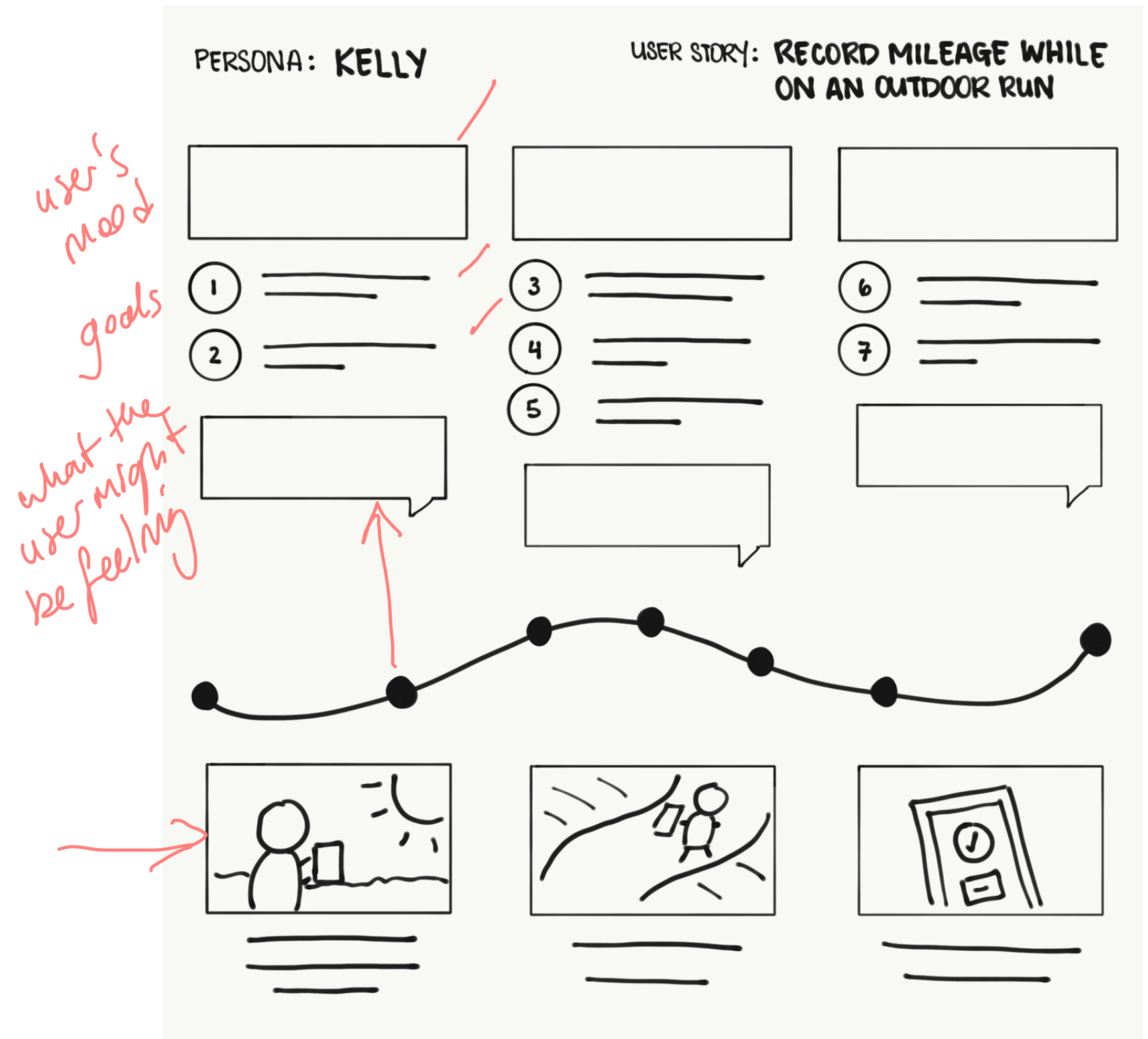
# Journey Maps

**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.

Source<sup>15</sup>

<sup>15</sup> NN/g: Journey Mapping 101



# 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*  $\beta$  will be released Wednesday at 4 pm