

Design Thinking

CS571: Building User Interfaces

Cole Nelson & Yixin Hu

In-Class Activities (ICA)

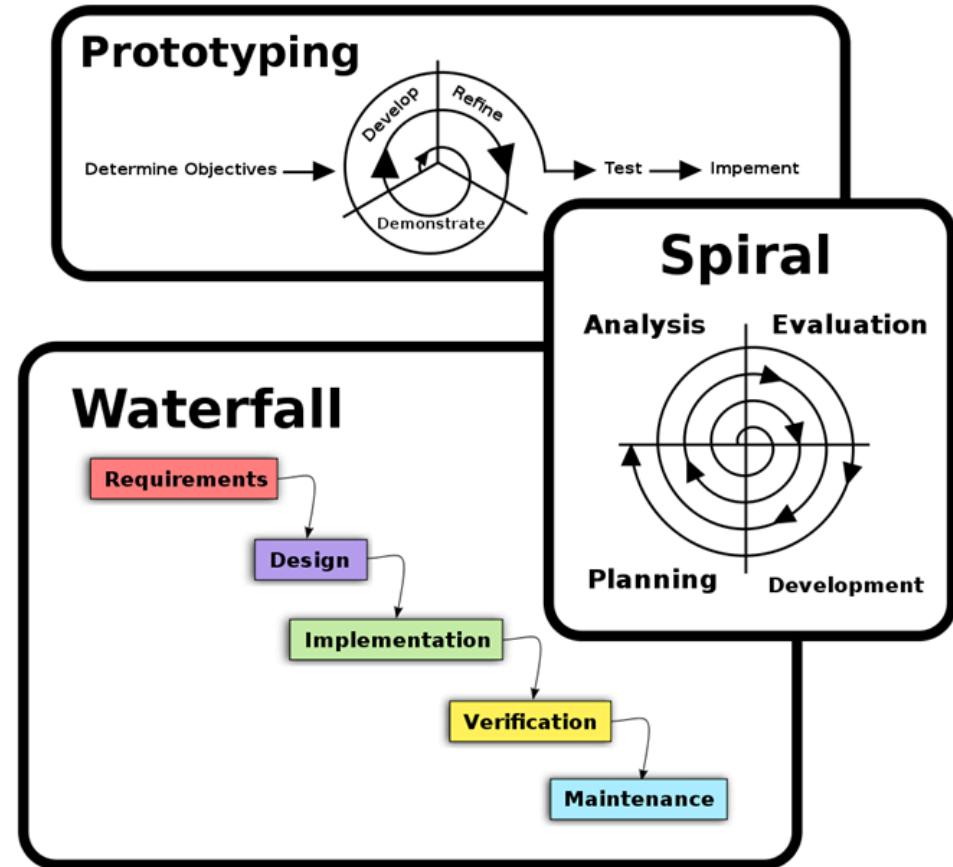
- Are due the following day at 11:59 pm.
- Synchronous? Put in a random group of 2 - 3.
- Asynchronous? ICAs are to be done individually.

Action: Make a copy of today's ICA
(Canvas -> Modules -> ICA A: Design Thinking)

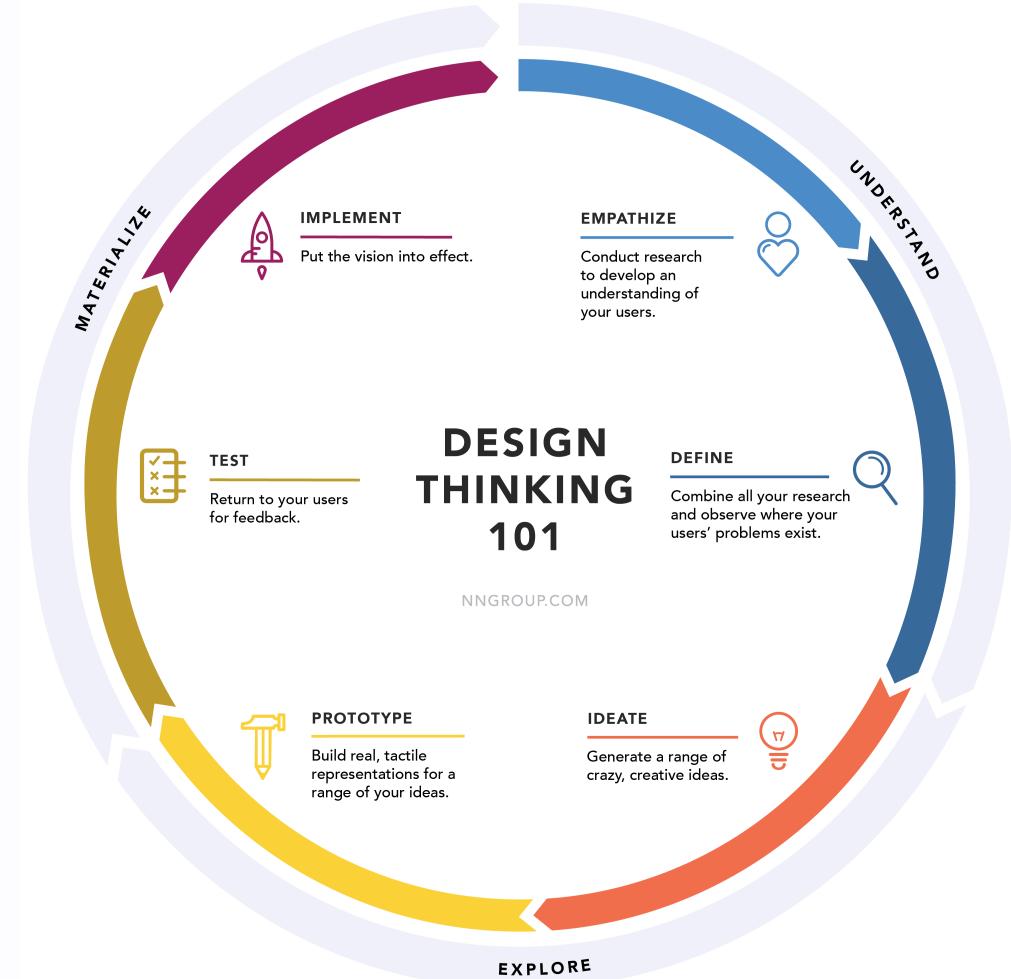
What will we learn today?

- What is design thinking?
- How do we empathize with users?
- How can we turn this empathy into insight?
- How to generate design ideas?

Engineering Process



Design Process



SDL Process



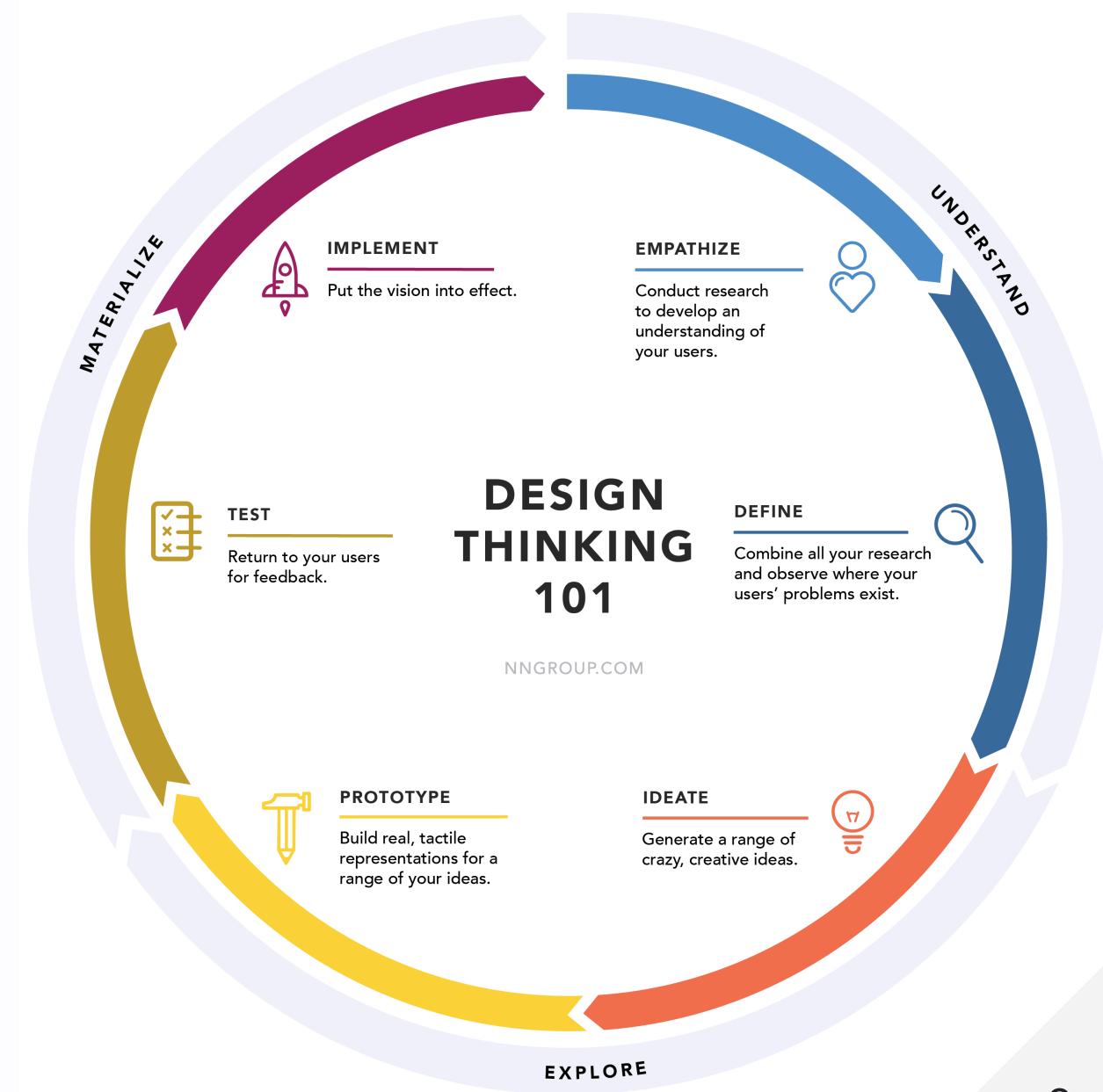
NN/g Design Thinking 101

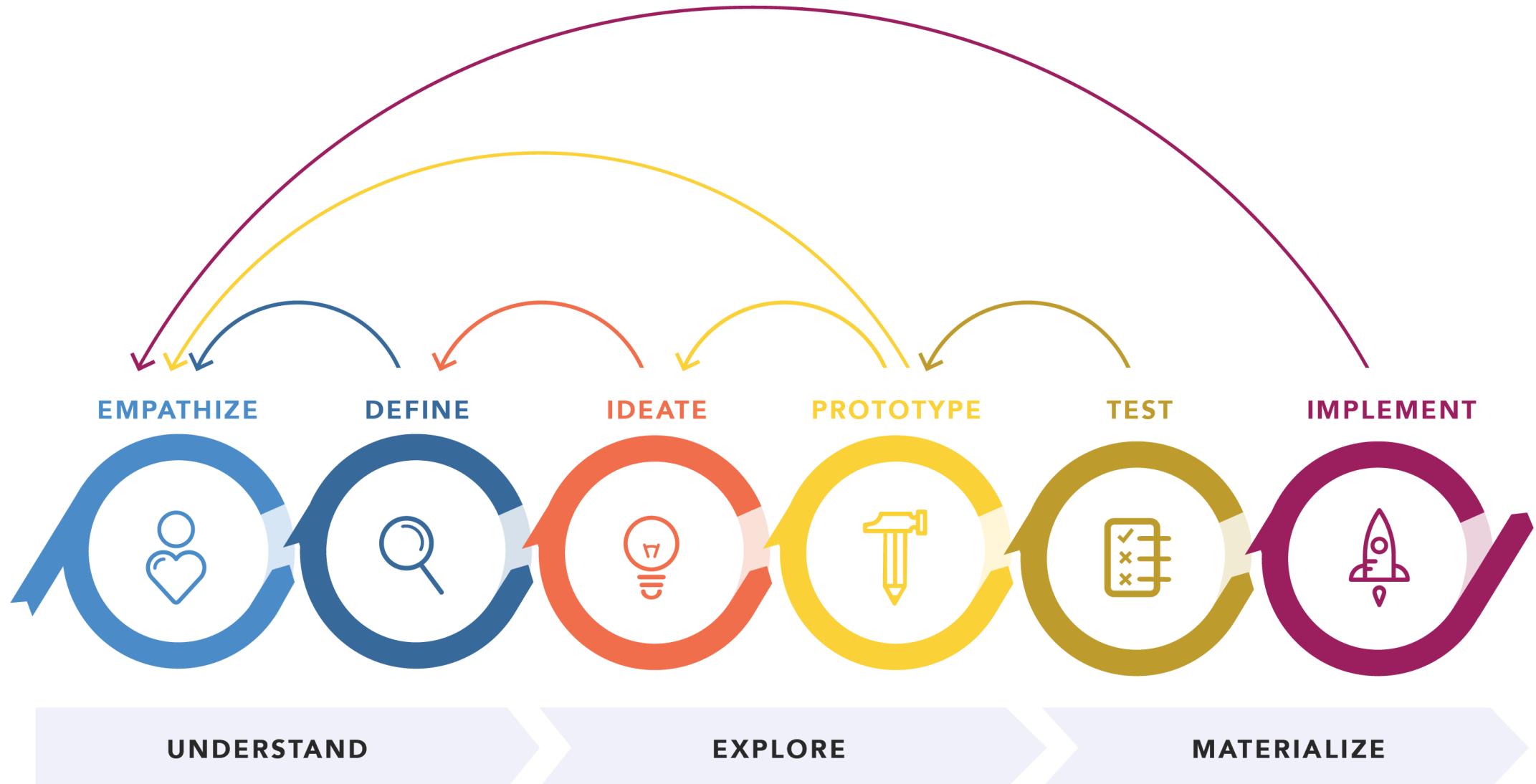
Design Thinking

1. An **approach**: a hands-on, user-centric approach to innovative problem solving

2. A **process**: six phases

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Empathize

Conduct research to develop an understanding of your users.

How do we empathize with users?

- Understanding user needs, preferences, and expectations by studying what users do, say, think, and feel.
- Methods to build empathy: think-aloud, ethnography, diary studies, cultural probes... (Check CS570!)

We will focus on the method **contextual inquiries** today.

Contextual Inquiry

A method for gathering and representing data about the user and their work.

Conducting a Contextual Inquiry

1. Go to where the customer works or lives.
2. Observe the customer as they work.
3. Talk to the customer about their work.

In Class Activity (ICA) - It's your Turn!

Your goal: Make the college grocery shopping experience better.

ICA A - 1. Empathizing:

Take notes as an observer of the following contextual inquiry. These can be *direct quotes*, *general observations*, *notes about the environment*, or anything else of interest and valuable to your research.

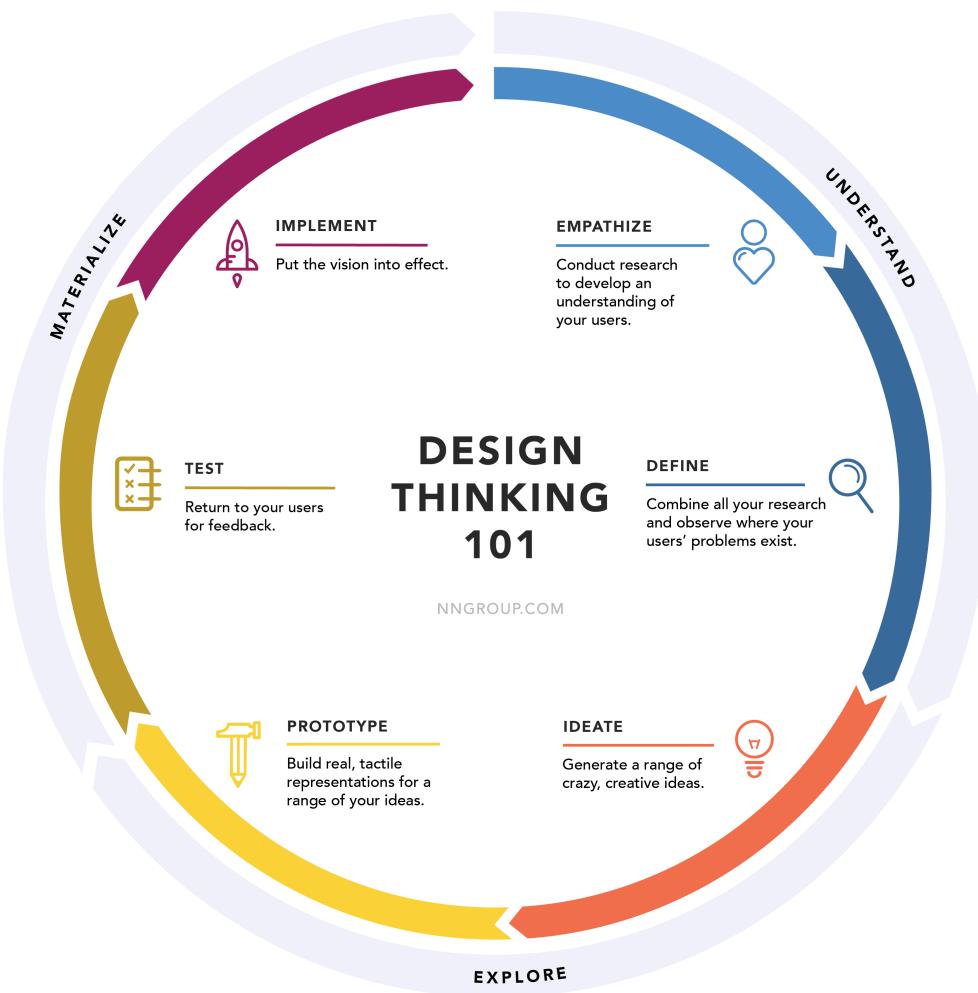
Take notes individually, consult afterwards as a team.



Contextual Inquiry: Grocery Shopping

Contextual Inquiry Tips

- This is an inquiry, not an interview.
- The user is the master, you are an apprentice.
- Ask questions, but don't distract from the task.
- Focus on the context in which the user acts.



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Define

Combine all your data and derive where your users' problems exist.

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

- **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.



NN/g Affinity Diagramming

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How do we go about it?

To do *bottom-up* affinity diagramming...

- **Step 1:** Start with many disorganized notes.
- **Step 2:** Group notes together based on "likeness".
- **Step 3:** Consult groupings with your team.
- **Step 4:** Re-organize if necessary!
- **Step 5:** Identify a common theme for each group.

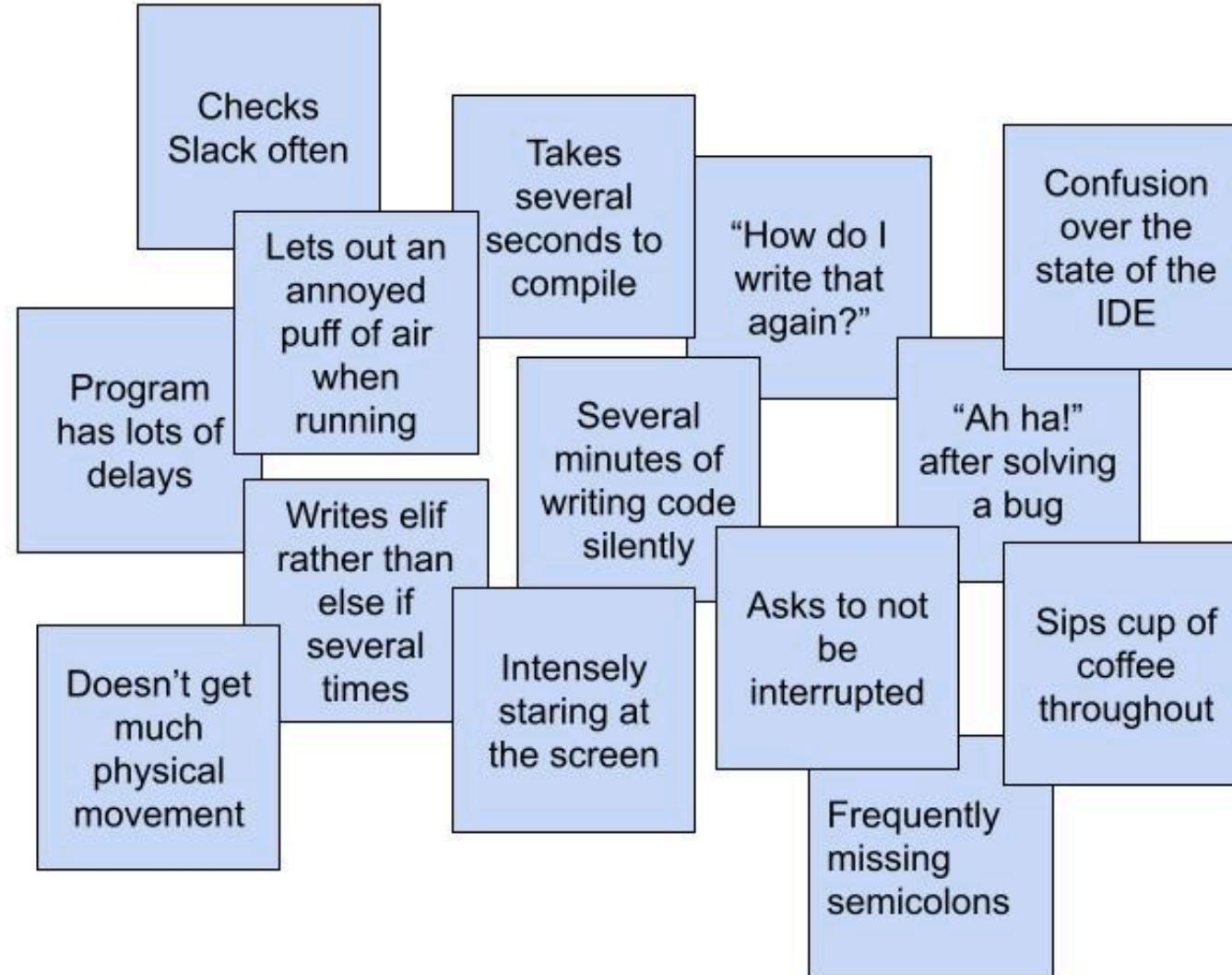
*There are many other ways to do affinity diagramming!



UX Collective

Affinity Diagramming

Example: A day in the life of a software engineer



Example: Unorganized Notes

Misunderstanding the syntax	In a state of flow	Issues with speed	Parking Lot
<p>Frequently missing semicolons</p> <p>"How do I write that again?"</p> <p>Writes elif rather than else if several times</p>	<p>Several minutes of writing code silently</p> <p>"Ah ha!" after solving a bug</p> <p>Asks to not be interrupted</p> <p>Intensely staring at the screen</p>	<p>Takes several seconds to compile</p> <p>Program has lots of delays</p>	<p>Checks Slack often</p> <p>Sips cup of coffee throughout</p> <p>Doesn't get much physical movement</p>

Example: Common Themes

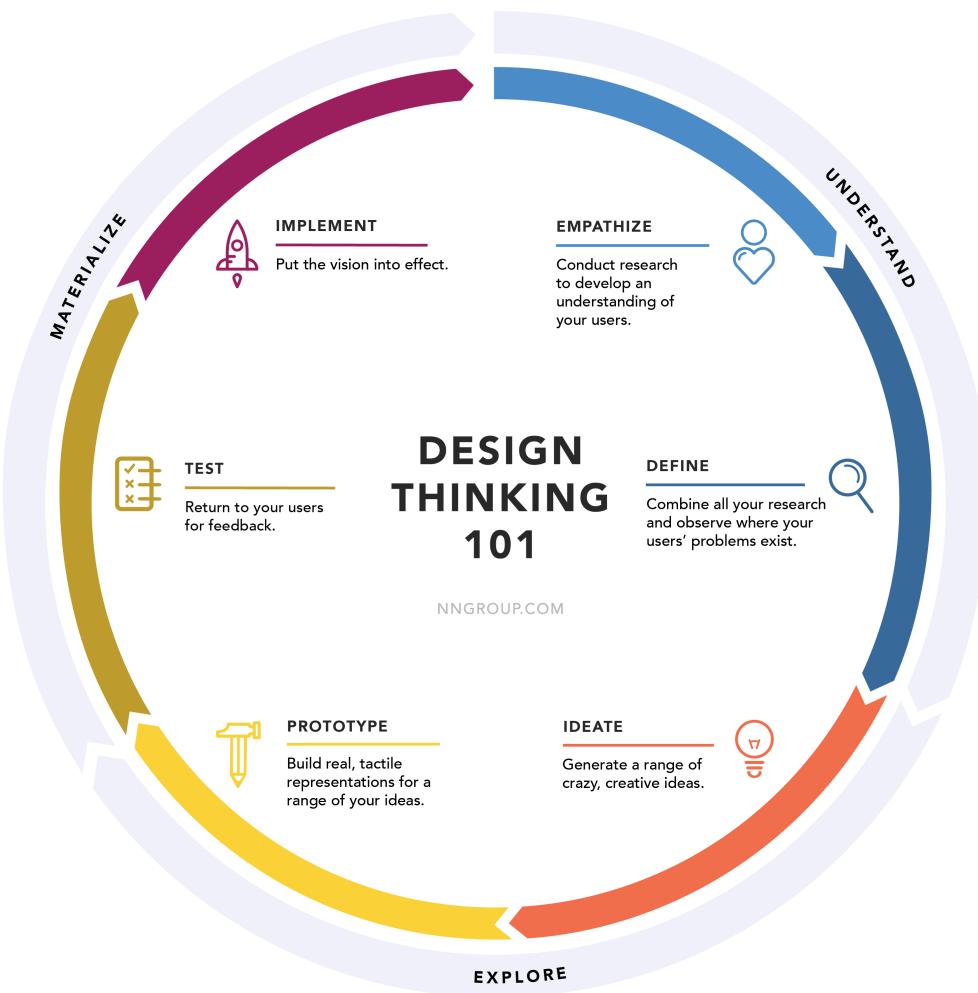
Voilà!

Your findings will serve as *design insights*.

In Class Activity (ICA) - Your Turn!

ICA A - 2. Defining

Use affinity diagramming to organize your notes and identify common themes. To do this, I recommend creating a [Google Drawing](#) and representing each sticky note with a square.



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Ideate

Generate a range of crazy, creative ideas.

Ideation

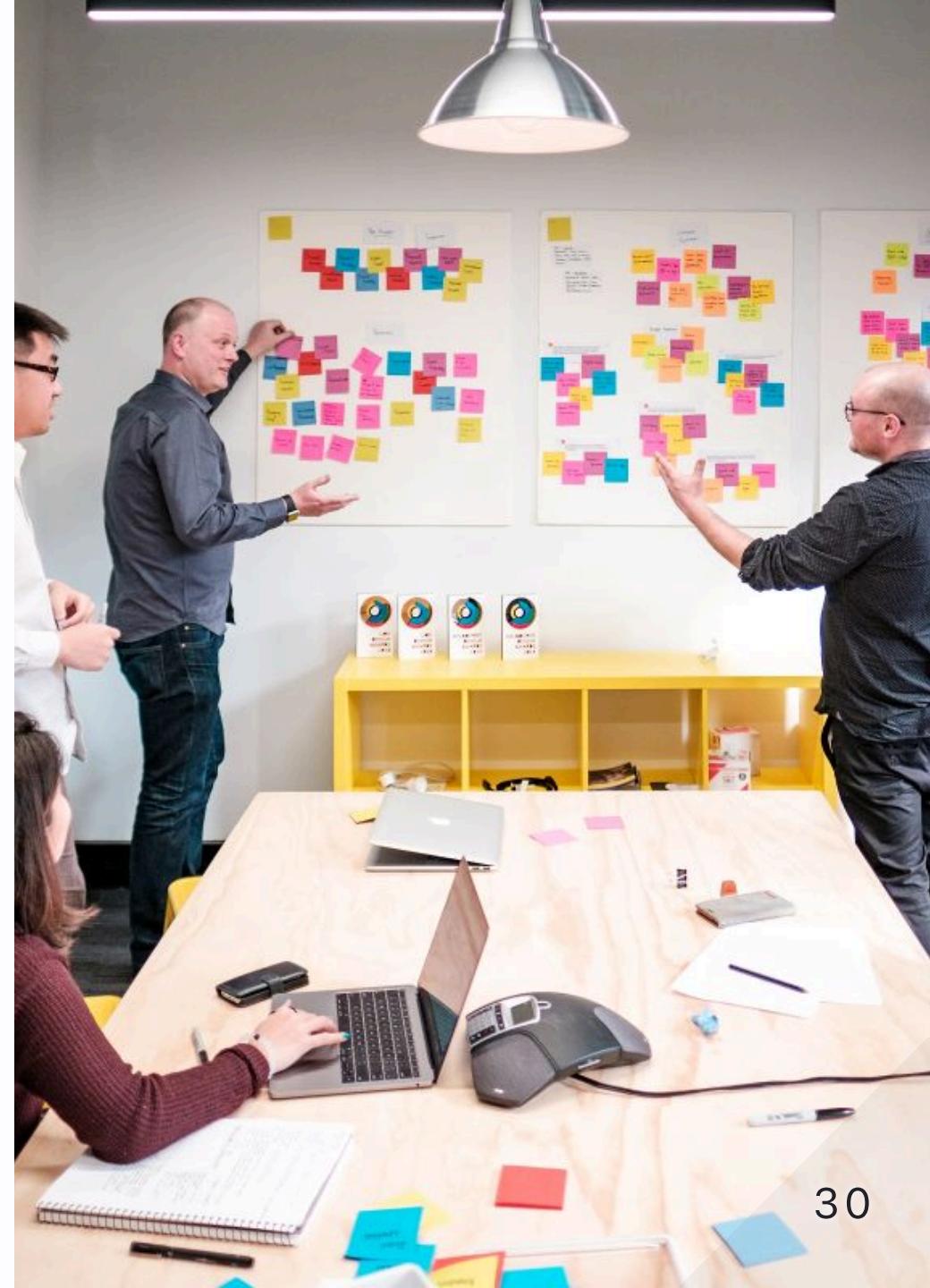
Definition: An active, creative, exploratory, highly iterative, fast-moving collaborative process for forming ideas for design.

Ideation can be done *individually* or *collaboratively*.

Key Considerations

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

GlassDoor



IDEO's Rules of Engagement

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.

What do we do with ideas?

Sketching. Storyboarding.

Sketching & storyboarding exhibit *conceptual designs*.

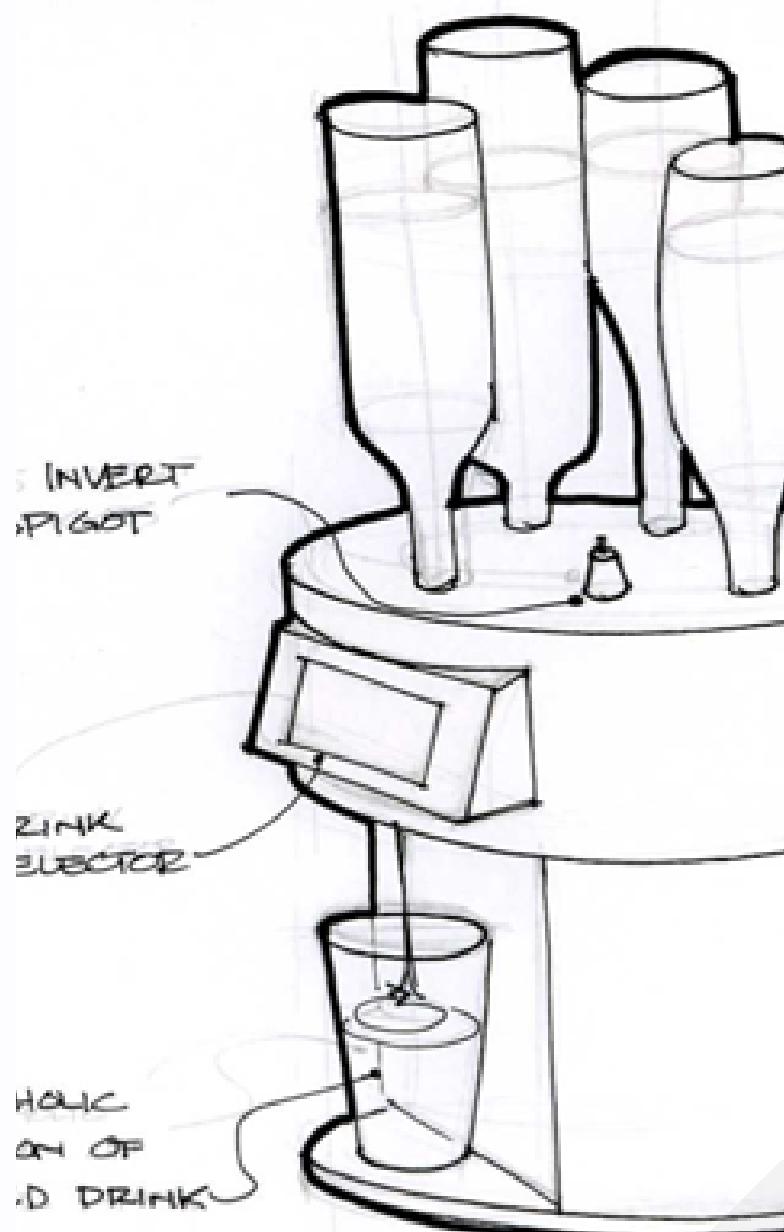
What is Conceptual Design?

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

Sketching

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

Buxton, 2007

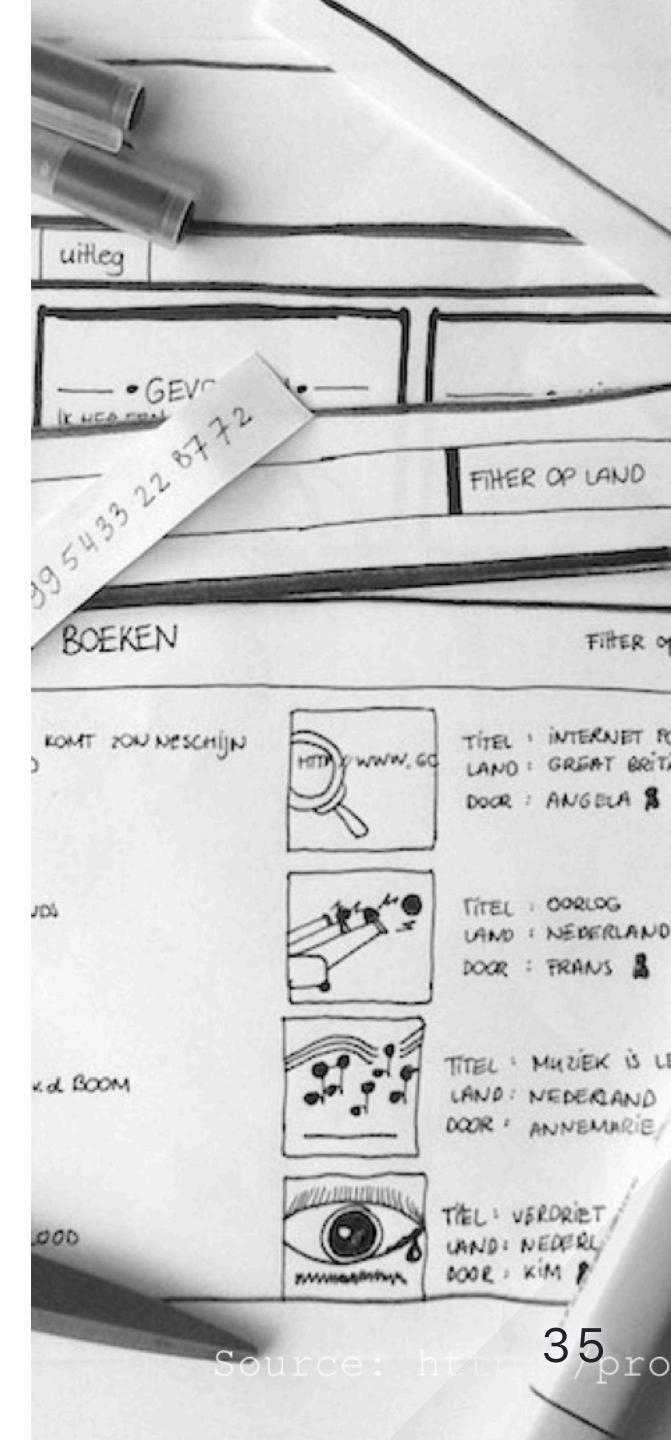


Sketching

- 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.

Buxton, 2007

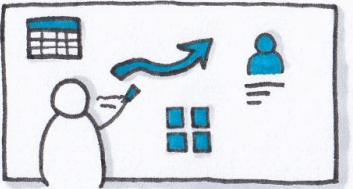
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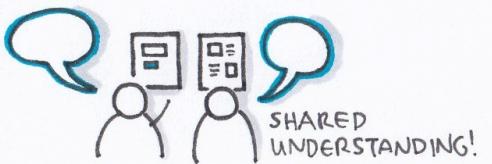


YOU CAN DRAW,
IT IS NOT ABOUT
BEING ARTISTIC!

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

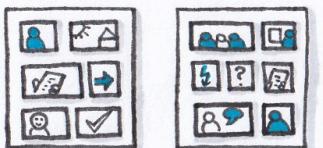


① FACILITATING MEETINGS &
DESIGN WORKSHOPS,
PROJECT PLANNING



SHARED
UNDERSTANDING!

⑤ TEAMWORK, ANY KIND OF
COLLABORATION
(E.G. „TALKING SKETCHES“)



Medium
⑨ STORYBOARDING
VALIDATING
ASSUMPTIONS

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UX Knowledge Base Sketch #52

SKETCHING

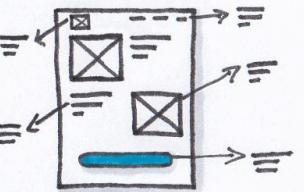
FOR UX DESIGNERS

TOOLS:
JUST GRAB THE NEAREST
PEN & PAPER!

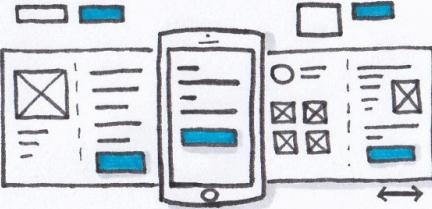


IN CASE OF USER INTERFACES:
VARY THE FIDELITY /
DETAIL LEVEL BASED ON
YOUR GOAL
(DELIVERABLE?
QUICK CONCEPT?)

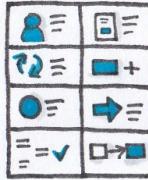
YOUR
AUDIENCE
(CLIENT? TEAM?
YOURSELF?)



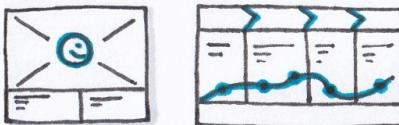
② WIREFRAMING
DON'T FORGET:
ANNOTATIONS ARE GREAT!



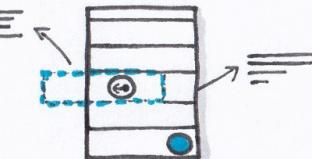
③ PAPER PROTOTYPING -
VALIDATING IDEAS,
TESTING OUT CONCEPTS



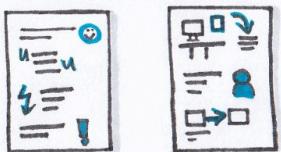
④ IDEATION
QUICK IDEA GENERATION
(E.G. DURING A DESIGN SPRINT,
OR JUST ON YOUR OWN)



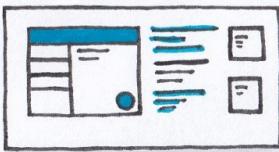
⑥ USER FLOWS
SITEMAPS
INFORMATION ARCHITECTURE



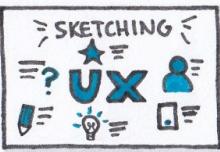
⑦ MAPPING: EMPATHY MAP,
JOURNEY MAP,
PRODUCT ROADMAP ETC.



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

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.

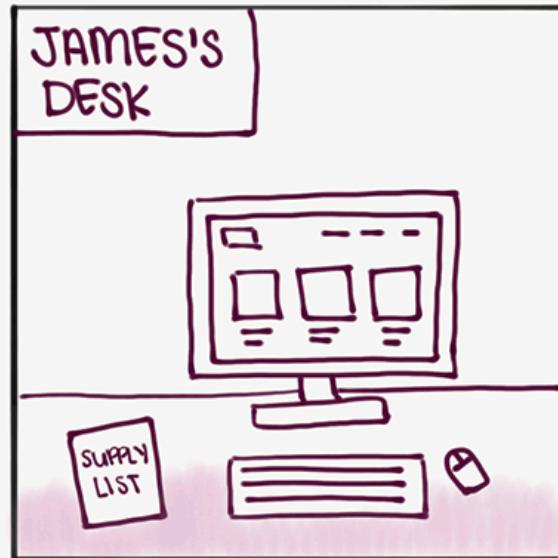
Take your sketches (in context!) and impose them on a storyboard.

STORYBOARD



- MAKES NOTE OF SUPPLIES NEEDED ON CLIPBOARD
- PHYSICAL INVENTORY

PERSONA:
CORPORATE BUYER,
JAMES



- SELECTS ITEMS FROM FAVORITES LIST
- USES DESKTOP & SUPPLY LIST AS TOOL

SCENARIO:
REPLENISH OFFICE SUPPLIES



- RECEIVES SHIPMENT WINDOW W/ ORDER SUBMISSION
- SETS PLAN FOR RESTOCK

NN/g: Storyboards Help Visualize UX Ideas

In Class Activity (ICA) - Your Turn!

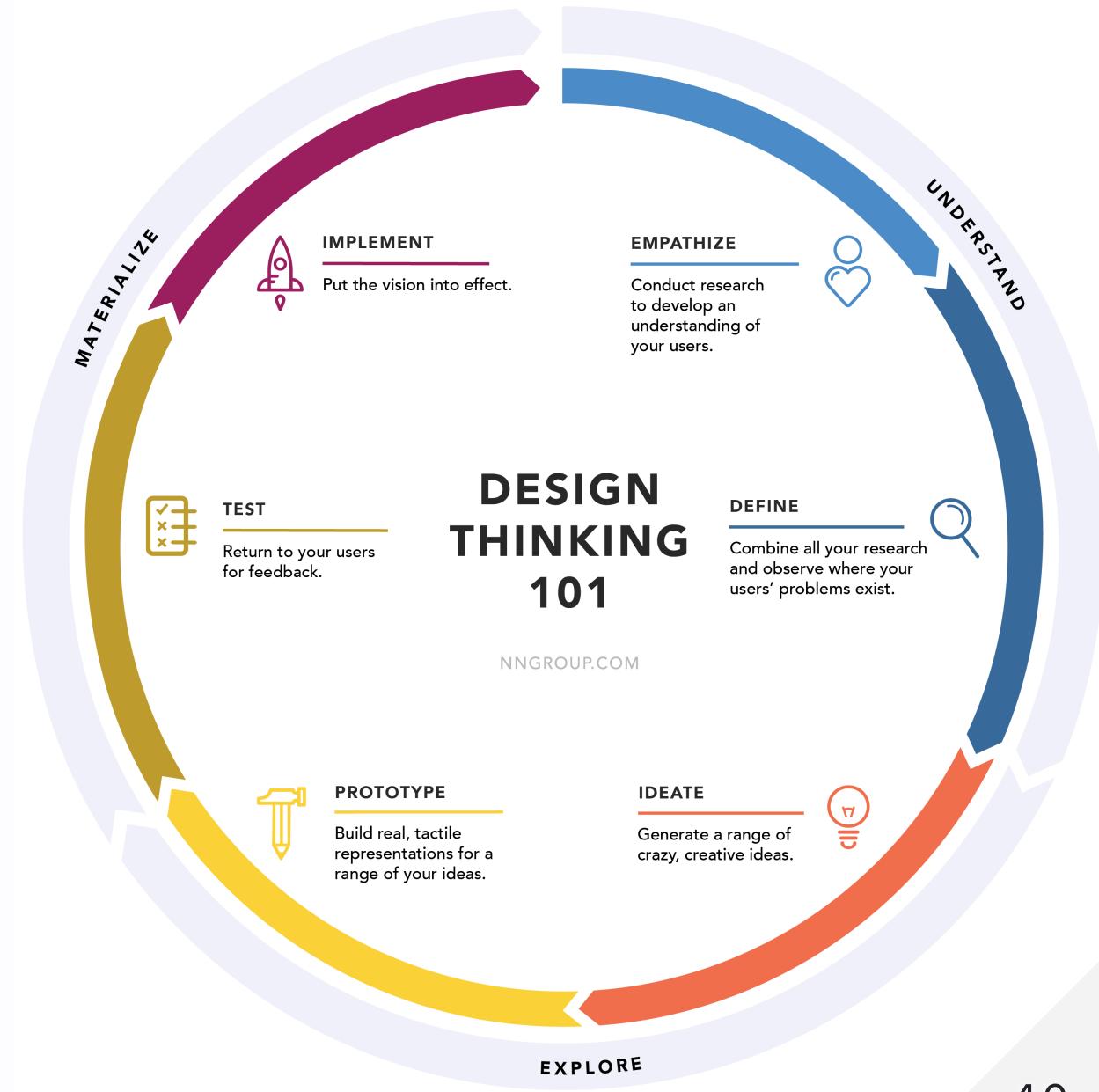
ICA A - 3. Ideating

Ideate what a solution could look like! Generate many crazy, wild ideas of what could make the college grocery shopping experience better.

Finally, choose 3 of your top ideas from above and sketch what each of these solutions would look like.

- Prototype
- Test
- Implement

Will be covered in future lectures



What did we learn today?

- What design thinking is.
- How we can empathize with users.
- How we can turn this empathy into insight.
- How we can generate and present our ideas.

Next Week

JavaScript Bootcamp 3 & Visual Design!

Questions?

Please submit ICA A on Canvas by 11:59 PM tomorrow (Jan 31).