

Human-Centered Design

Rapid introduction to how a design thinking mindset can transform your projects



Rock, Paper, Scissors Tournament

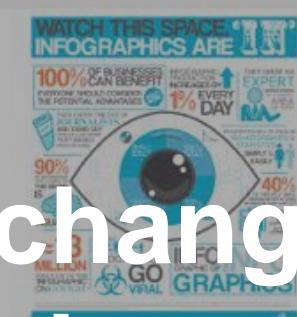


Design Researcher PhD Candidate



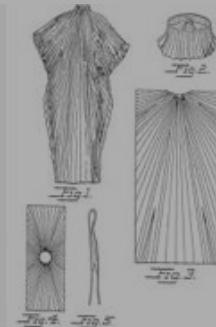
DESIGN *for* **AMERICA**
colorado students using design to create local and social impact

What is design?



“design is changing existing circumstances into preferred ones”

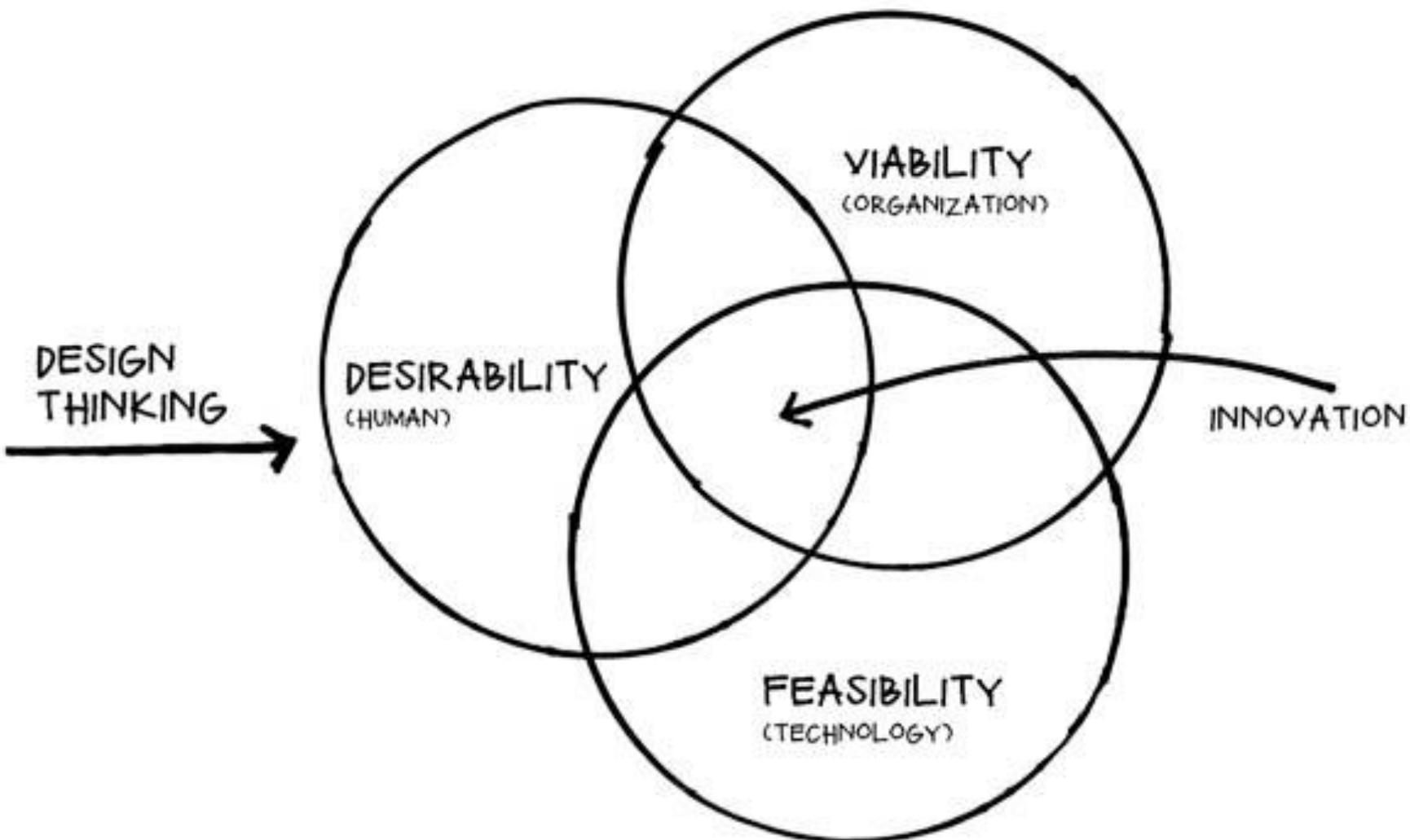
Herbet Simon



What is
design thinking?

Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.

Tim Brown, CEO of IDEO





THINK
IMPACT



GE Healthcare



dyson

SMART DESIGN

GREATER
GOOD
STUDIO



FCA

FIAT CHRYSLER AUTOMOBILES



COVIDIEN

SC Johnson
A FAMILY COMPANY

adaptive path

z i b a mad*poш

Sapient

Gensler



CONTINUUM



gravitytank

ThoughtWorks®



Google openIDEO



Deloitte.

IDEO

STARTING BLOC

3M



intuit



MOTOROLA

Newell Rubbermaid™

Brands That Matter

FJORD™

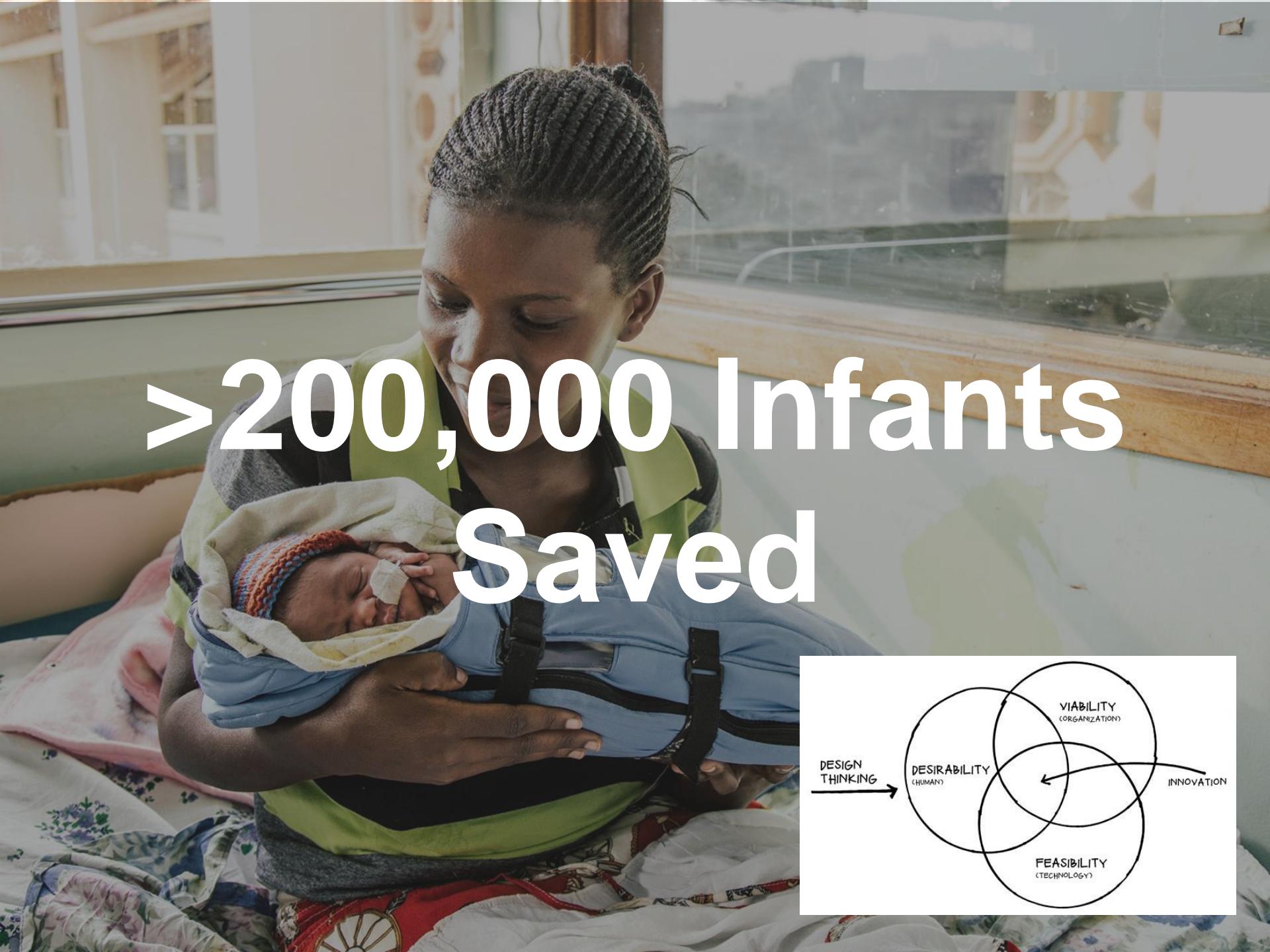
ReWork



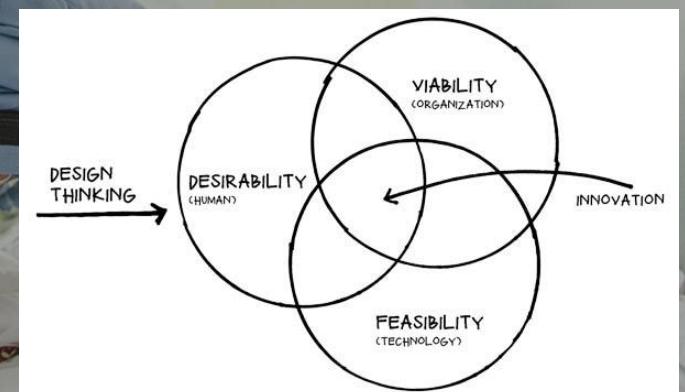
Microsoft

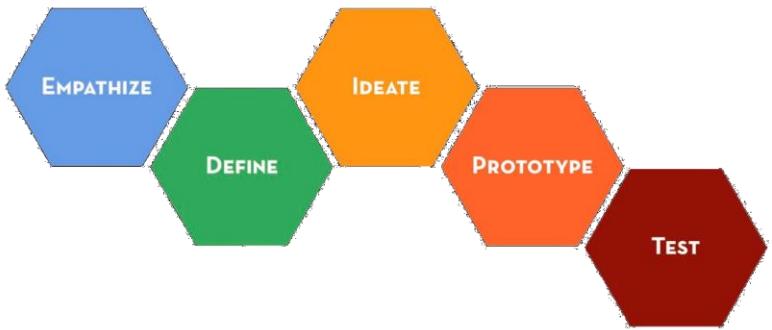
R/GA



A photograph of a woman with dark skin and braided hair, wearing a green and yellow patterned dress, holding a newborn baby wrapped in a white and yellow patterned blanket. The baby is wearing a blue and red knitted hat. They are in a room with a window showing a view of a city.

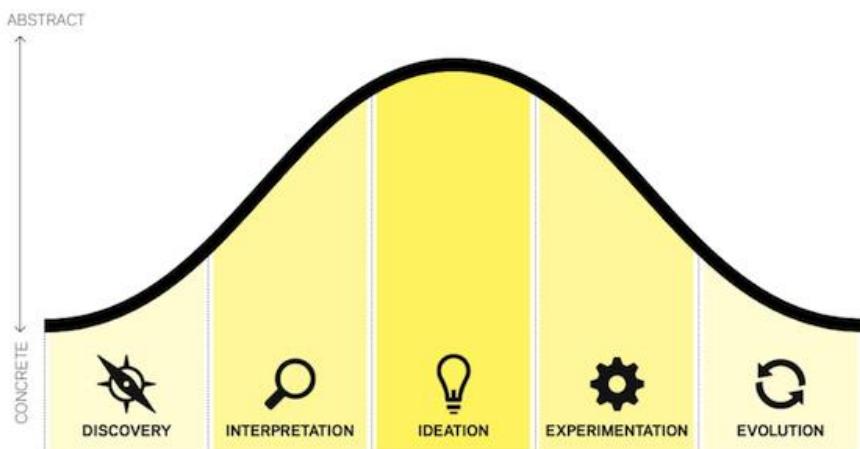
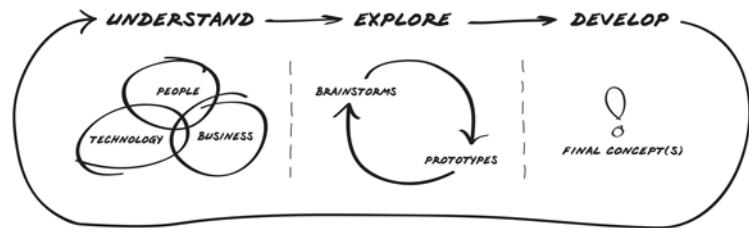
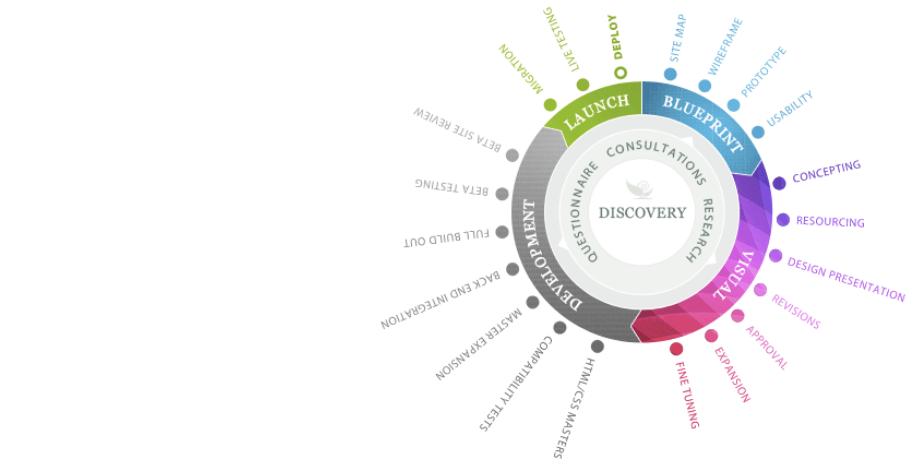
>200,000 Infants
Saved



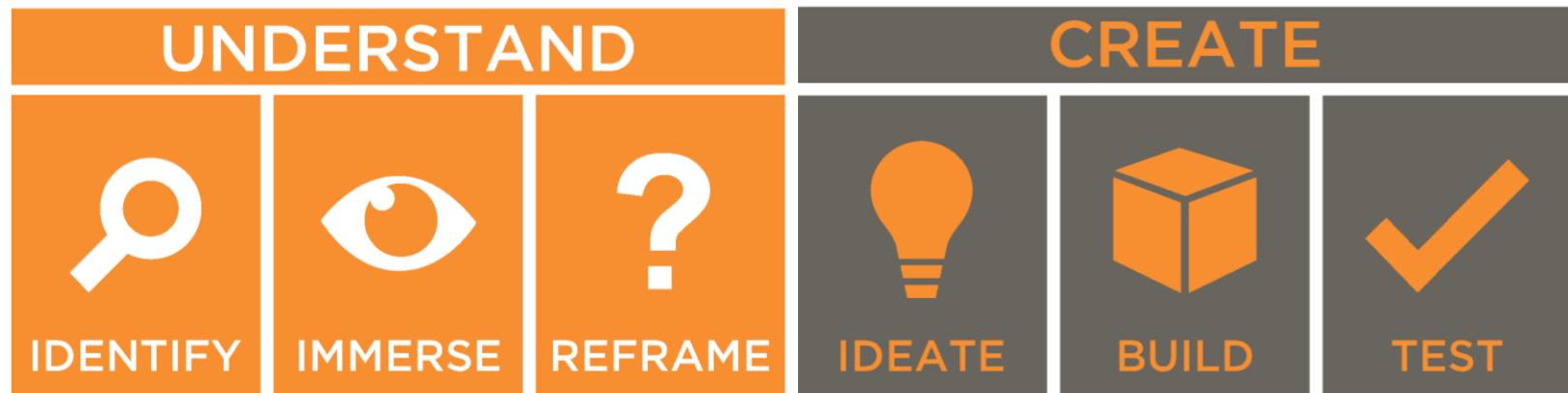


To recall these phases, simply remember H-C-D.

From IDEO Human Centered Design Toolkit



Human-Centered Design Thinking Process



UNDERSTAND



A photograph of a woman with blonde hair and sunglasses, wearing a white t-shirt, pointing her right index finger towards the left. She is outdoors in a grassy area with trees and power lines in the background. In the foreground, a man in a yellow shirt is writing in a notebook. Behind her, two other people are also writing in notebooks. The scene suggests an outdoor activity or survey.

IDENTIFY



Define targeted areas to focus
future research.

WHY IDENTIFY?



Today there are
32 million
Americans aged 65+

12 million *and more have trouble walking*
11 million *and more have trouble using stairs*
9 million *and more use a mobility device
such as wheelchairs, scooters,
walkers, canes, crutches*



The mobility device market is expected to grow from **\$4B** to **\$8B** by 2020



How can we help the elderly create positive long-term habits of mobility device use to reduce the need for more drastic solutions caused by additional injury?



How can we design a medical device that reduces doctor error and the total procedure time to reduce the cost and enhance the outcome for the patient?

Do you have a clear problem statement?

2 minutes



IMMERSE



Empathize w/ stakeholders
+ uncover insights
to deeply understand
your problem spaces.

WHY IMMERSE?



Who are the primary users? The secondary users? The tertiary users?



Primary Users: Individuals directly using and adopting tech



Secondary Users: Not direct users, but still affected by use



Tertiary Users: sales, manufacturers, etc.





Primary Users: Individuals directly using and adopting tech



Secondary Users: Not direct users, but still affected by use



Tertiary Users: sales, manufacturers, etc.

Who are your primary, secondary, and tertiary users?

3 minutes



Linden



Empathy



In order to have empathy for someone you need to understand all the parts of the problem



Assumption

noun / ə'səm(p)SH(ə)n/

a thing that is accepted as true or as certain to happen, without proof.

What are assumptions you have?

3 minutes



Assumptions:

What does your user **SAY?**



What does your user **THINK?**



How does your user **ACT?**



How does your user **FEEL?**

What does your user think, do,
say and feel?

What are some pains and gains?



Assumptions:

What does your user **SAY?**



What does your user **THINK?**



How does your user **ACT?**

How does your user **FEEL?**

Make 1 Empathy Map

7 minutes

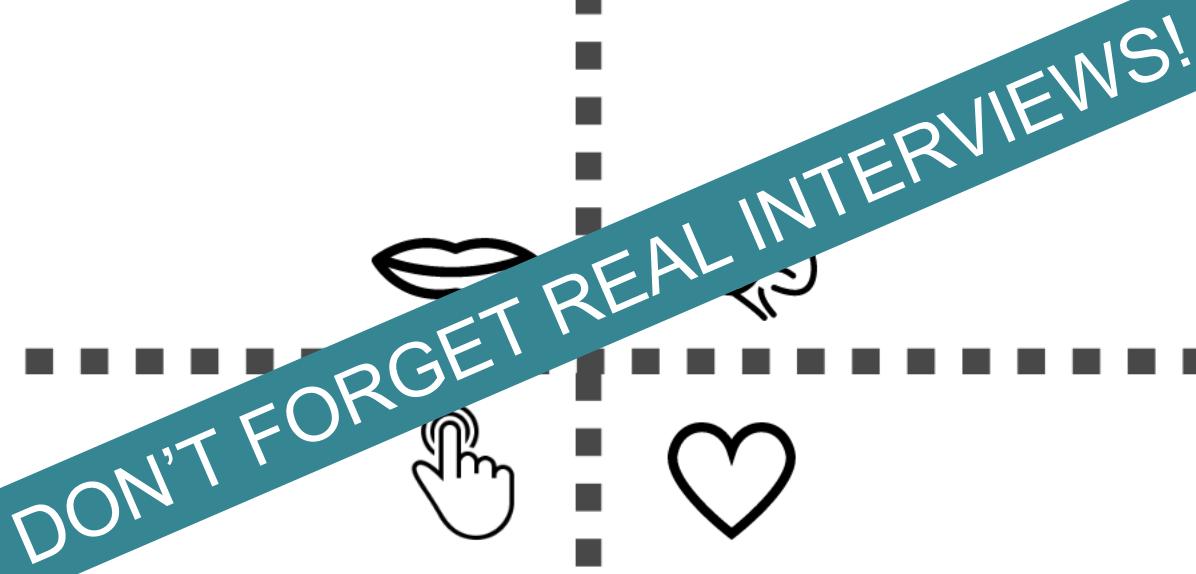


Assumptions:

What does your user **SAY?**

What does your user **THINK?**

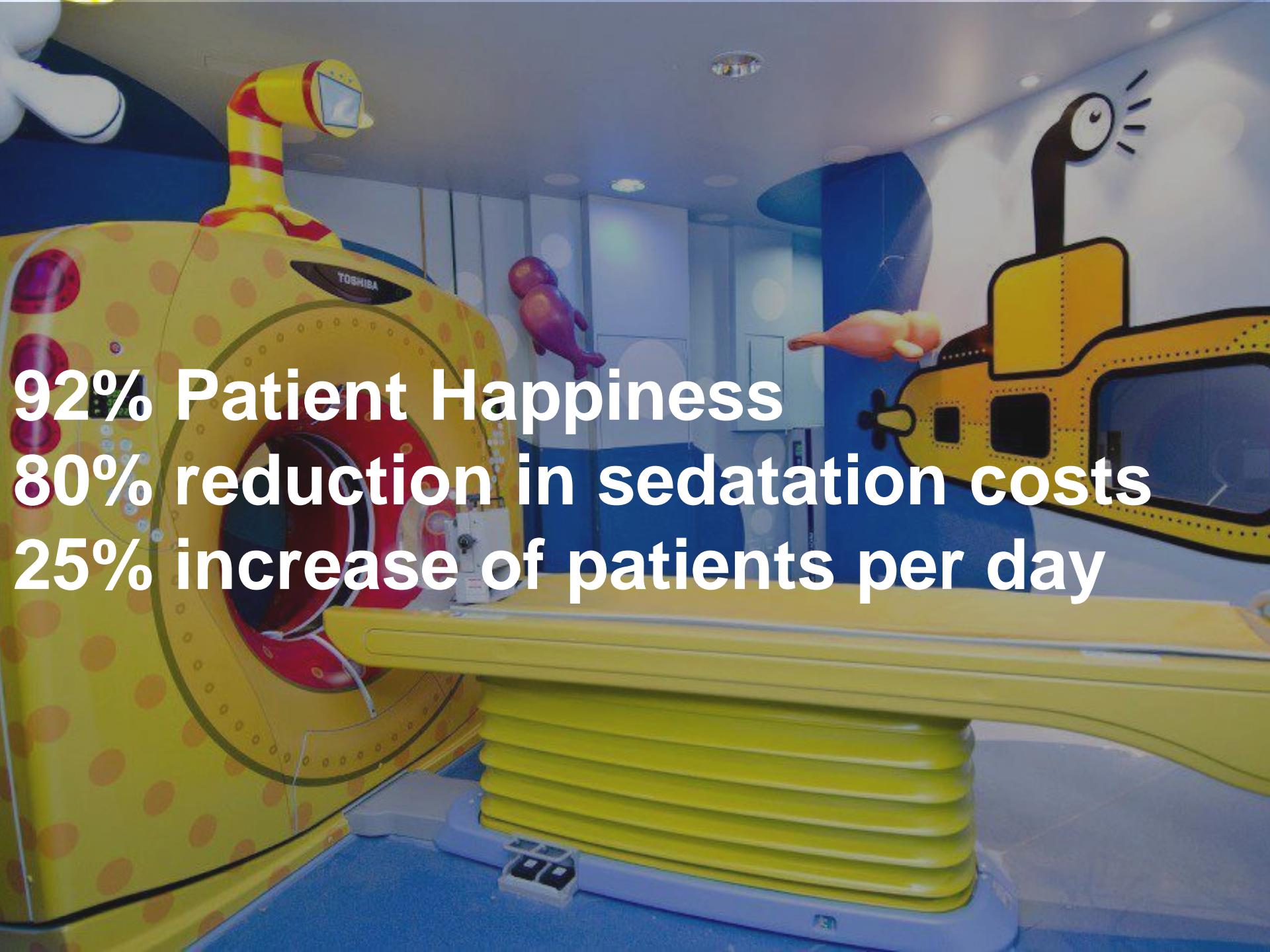
DON'T FORGET REAL INTERVIEWS!



How does your user **ACT?**

How does your user **FEEL?**





92% Patient Happiness
80% reduction in sedation costs
25% increase of patients per day

Empathy



Secondary Research





Empathy

Secondary Research

User Research





Empathy

Secondary Research

User Research

Synthesis



REFRAME

?



Articulate what possible
solutions need to do
to define the change
you want to make.

WHY REFRAME?



HOW CAN WE'S

?

“How Can We...” (HCW)

noun \’ haū-’ ken-’ wē

A type of challenge statement that takes the form of a specific question:

HOW CAN WE'S



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“How Can We...” (HCW)

noun \’ haū-’ ken-’ wē

A type of challenge statement that takes the form of a specific question:

“How Can We + user...

HOW CAN WE'S



“How Can We...” (HCW)

noun \’ haū-’ ken-’ wē

A type of challenge statement that takes the form of a specific question:

“How Can We + user + behavior...

HOW CAN WE'S



“How Can We...” (HCW)

noun \’ haū-’ ken-’ wē

A type of challenge statement that takes the form of a specific question:

“How Can We + user + behavior + place”

HOW CAN WE'S



SwipeSense



Hand hygiene just got a whole lot easier.

According to the CDC, increasing hand hygiene is the best way to prevent illness and infections. SwipeSense is an affordable, data-driven, hand hygiene platform for doing just that.

Welcome to Hand Hygiene [2.0](#)

How Can We's for SwipeSense

HOW CAN WE'S

?

How can we encourage the hospital staff to disinfect their hands before every patient interaction?

How Can We's for SwipeSense

HOW CAN WE'S



How can we encourage the hospital staff to disinfect their hands before every patient interaction?

How can we have medical techs inform patients about hand sanitation during the check-in process?

How Can We's for SwipeSense

HOW CAN WE'S



How can we encourage the hospital staff to disinfect their hands before every patient interaction?

How can we have medical techs inform patients about hand sanitation during the check-in process?

How can we provide nurses and medical staff with an easy way to disinfect the hospital rooms after each stay?

How Can We's for SwipeSense

HOW CAN WE'S



“How Can We + user + behavior + place”

How can we encourage the hospital staff to disinfect their hands before every patient interaction?

How can we have medical techs inform patients about hand sanitation during the check-in process?

How can we provide nurses and medical staff with an easy way to disinfect the hospital rooms after each stay?

Brainstorm How Can We's

3 minutes individual



“How Can We + user + behavior + place”

How can we encourage the hospital staff to disinfect their hands before every patient interaction?

How can we have medical techs inform patients about hand sanitation during the check-in process?

How can we provide nurses and medical staff with an easy way to disinfect the hospital rooms after each stay?

Share How Can We's

3 minutes group



“How Can We + user + behavior + place”

How can we encourage the hospital staff to disinfect their hands before every patient interaction?

How can we have medical techs inform patients about hand sanitation during the check-in process?

How can we provide nurses and medical staff with an easy way to disinfect the hospital rooms after each stay?

Pick 2 How Can We's

3 minutes



CREATE



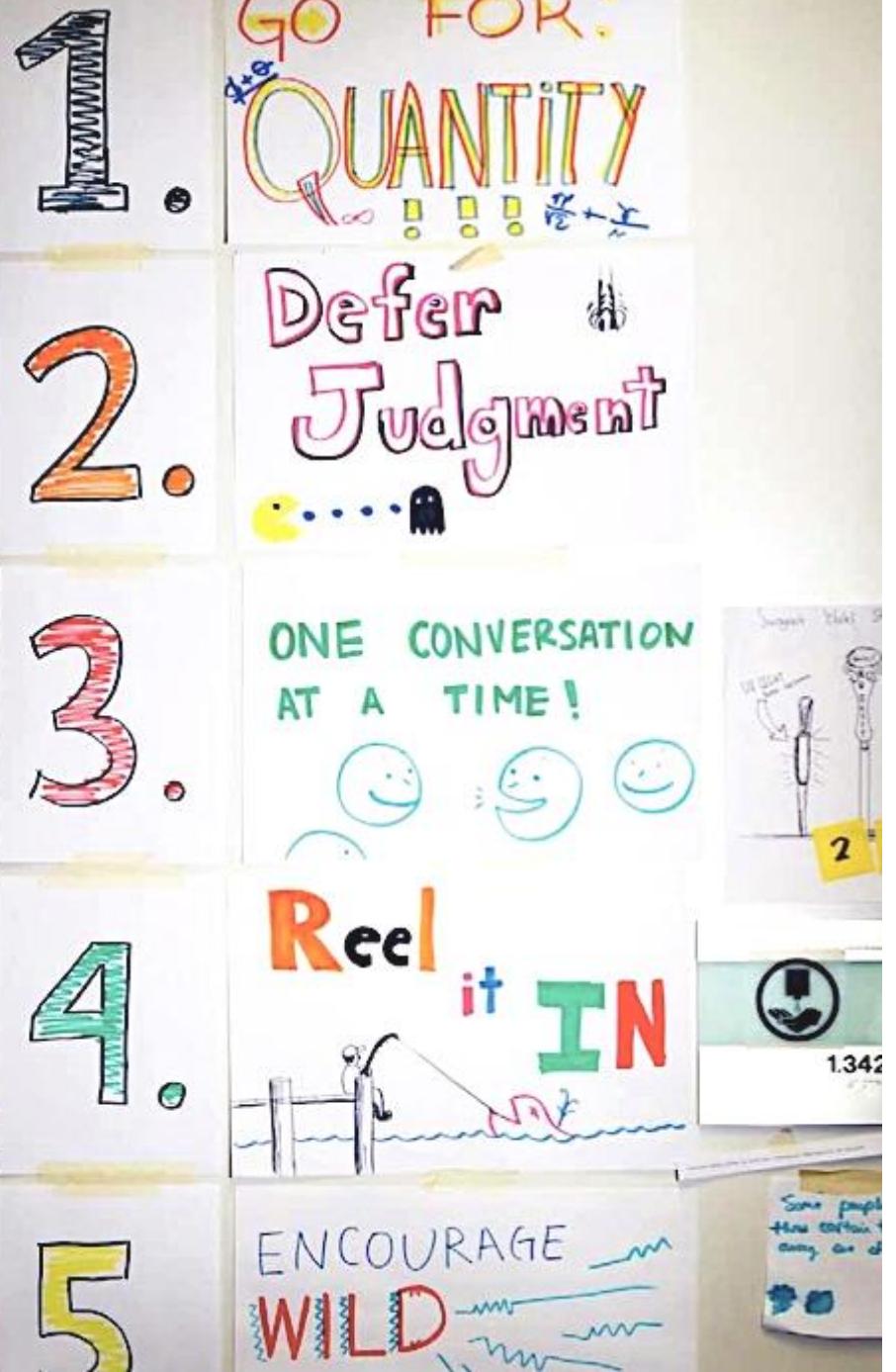


Generate a variety of ways
that make change
to explore many alternative
solutions.

WHY IDEATE?

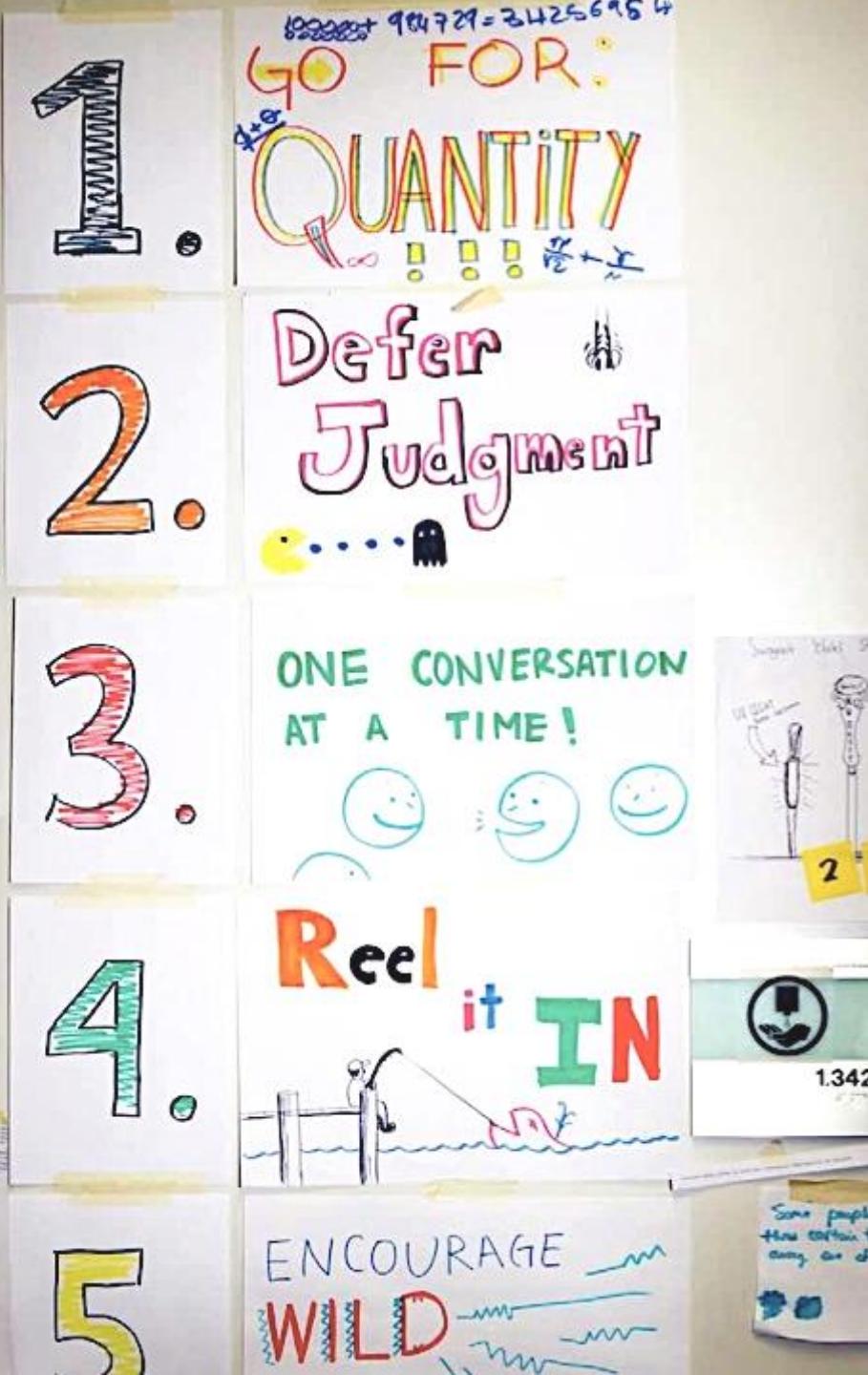


RULES OF BRAINSTORMING



RULES OF BRAINSTORMING

- 1 Quantity over Quality



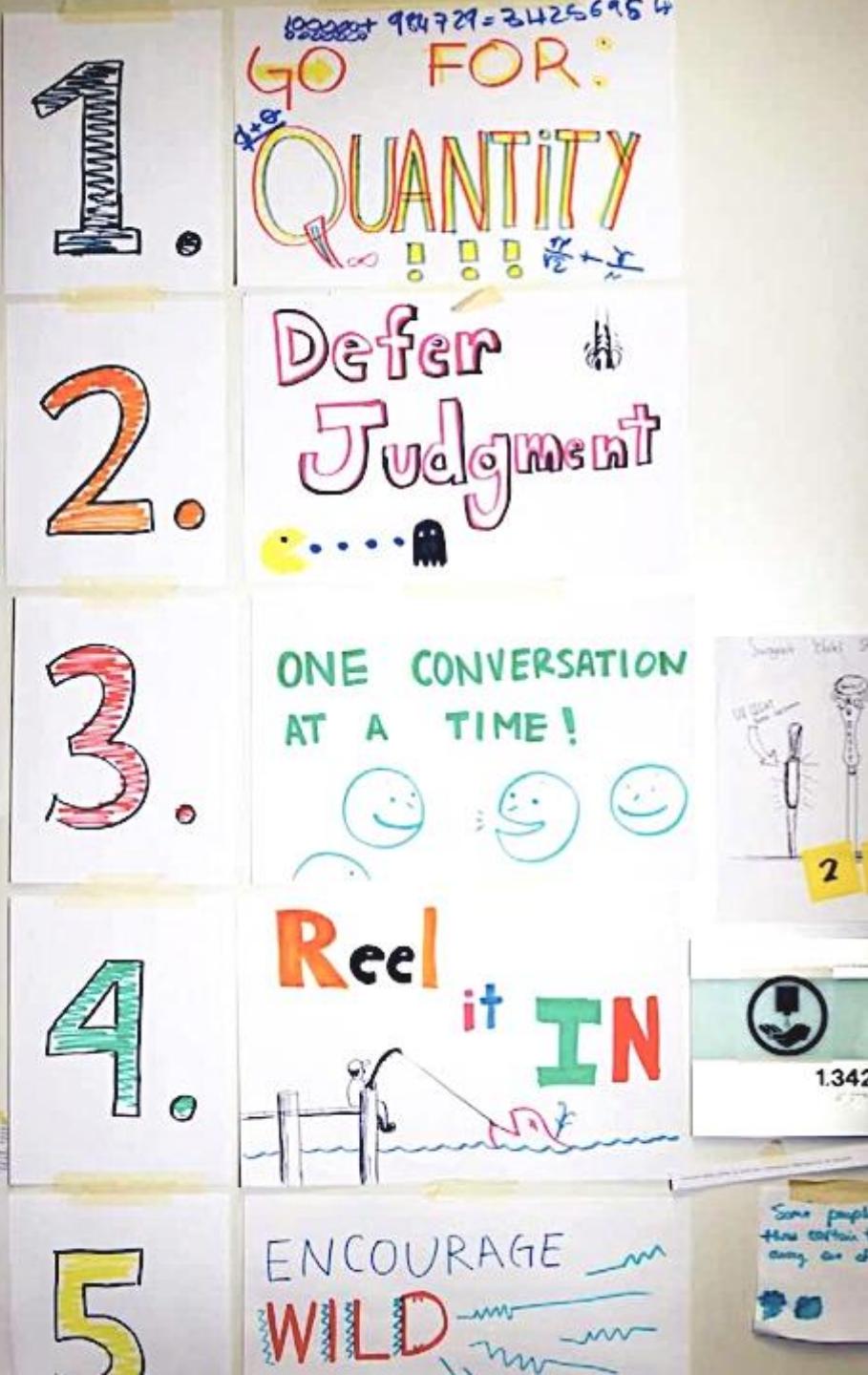
RULES OF BRAINSTORMING

- 1 Quantity over Quality
- 2 Defer Judgment



RULES OF BRAINSTORMING

- 1 Quantity over Quality
- 2 Defer Judgment
- 3 Build on Ideas



RULES OF BRAINSTORMING

- 1 Quantity over Quality
- 2 Defer Judgment
- 3 Build on Ideas
- 4 Encourage Wild Ideas



RULES OF BRAINSTORMING

- 1 Quantity over Quality
- 2 Defer Judgment
- 3 Build on Ideas
- 4 Encourage Wild Ideas
- 5 Visualize Ideas



RULES OF BRAINSTORMING

- 1 Quantity over Quality
- 2 Defer Judgment
- 3 Build on Ideas
- 4 Encourage Wild Ideas
- 5 Visualize Ideas
- 6 Stay Focused





RULES OF BRAINSTORMING

- 1 Quantity over Quality
- 2 Defer Judgment
- 3 Build on Ideas
- 4 Encourage Wild Ideas
- 5 Visualize Ideas
- 6 Stay Focused

Brainstorm!

3 minutes individual



1.

GO FOR:
QUANTITY
!!!

2.

Defer Judgment

3.

ONE CONVERSATION
AT A TIME!



4

Reel

RULES OF BRAINSTORMING

- 1 Quantity over Quality
- 2 Defer Judgment
- 3 Build on Ideas
- 4 Encourage Wild Ideas
- 5 Visualize Ideas
- 6 Stay Focused

Build on the ideas of others!

7 minutes group





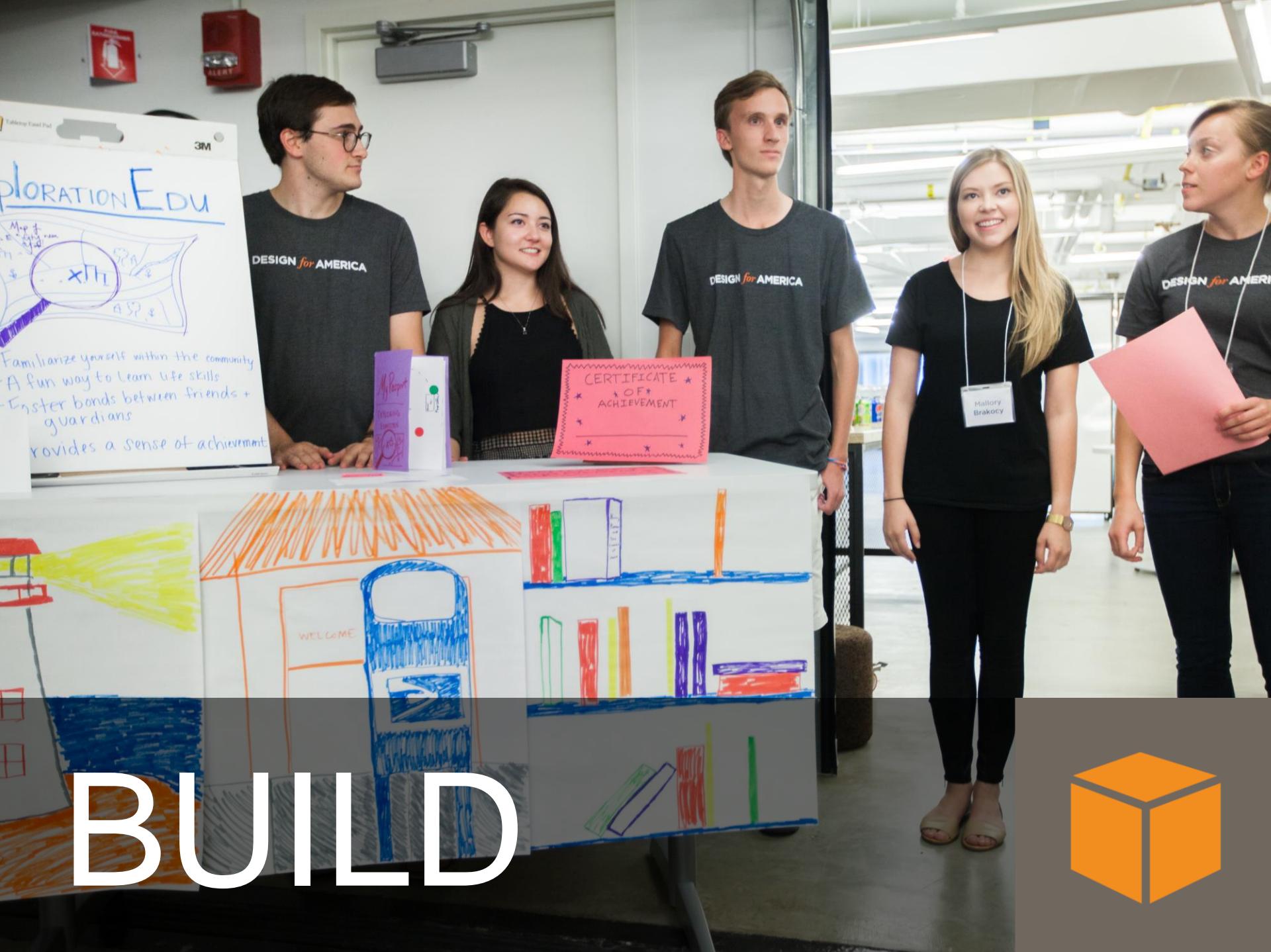
RULES OF BRAINSTORMING

- 1 Quantity over Quality
- 2 Defer Judgment
- 3 Build on Ideas
- 4 Encourage Wild Ideas
- 5 Visualize Ideas
- 6 Stay Focused

Pick 1-3 ideas

3 minutes





BUILD



Make a variety of tangible
prototypes
to communicate + test
your ideas.

WHY BUILD?

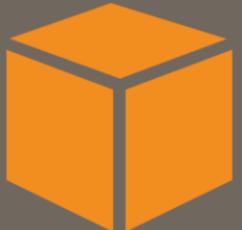


BUILD BASICS



1 What can each team member build?

BUILD BASICS



- 1 What can each team member build?
- 2 How can we break up this idea a few pieces for prototyping?

BUILD BASICS



- 1 What can each team member build?
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- 3 What is the simplest way to build these prototypes?

BUILD BASICS



- 1 What can each team member build?
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- 4 What 2-3 questions are we looking for feedback?

BUILD BASICS



- 1 What can each team member build?
- 2 How can we break up this idea a few pieces for prototyping?
- 3 What is the simplest way to build these prototypes?
- 4 What 2-3 questions are we looking for feedback?

Build 1-3 low-fidelity
Prototypes!

10 minutes



- 1 What can each team member build?
- 2 How can we break up this idea a few pieces for prototyping?
- 3 What is the simplest way to build these prototypes?
- 4 What 2-3 questions are we looking for feedback?

Prepare to present

3 minutes



TEST



Get feedback
to uncover insights
+ develop next steps
to improve solutions.

WHY TEST?





Interviews + Focus Groups



Interviews + Focus Groups

Think-Alouds



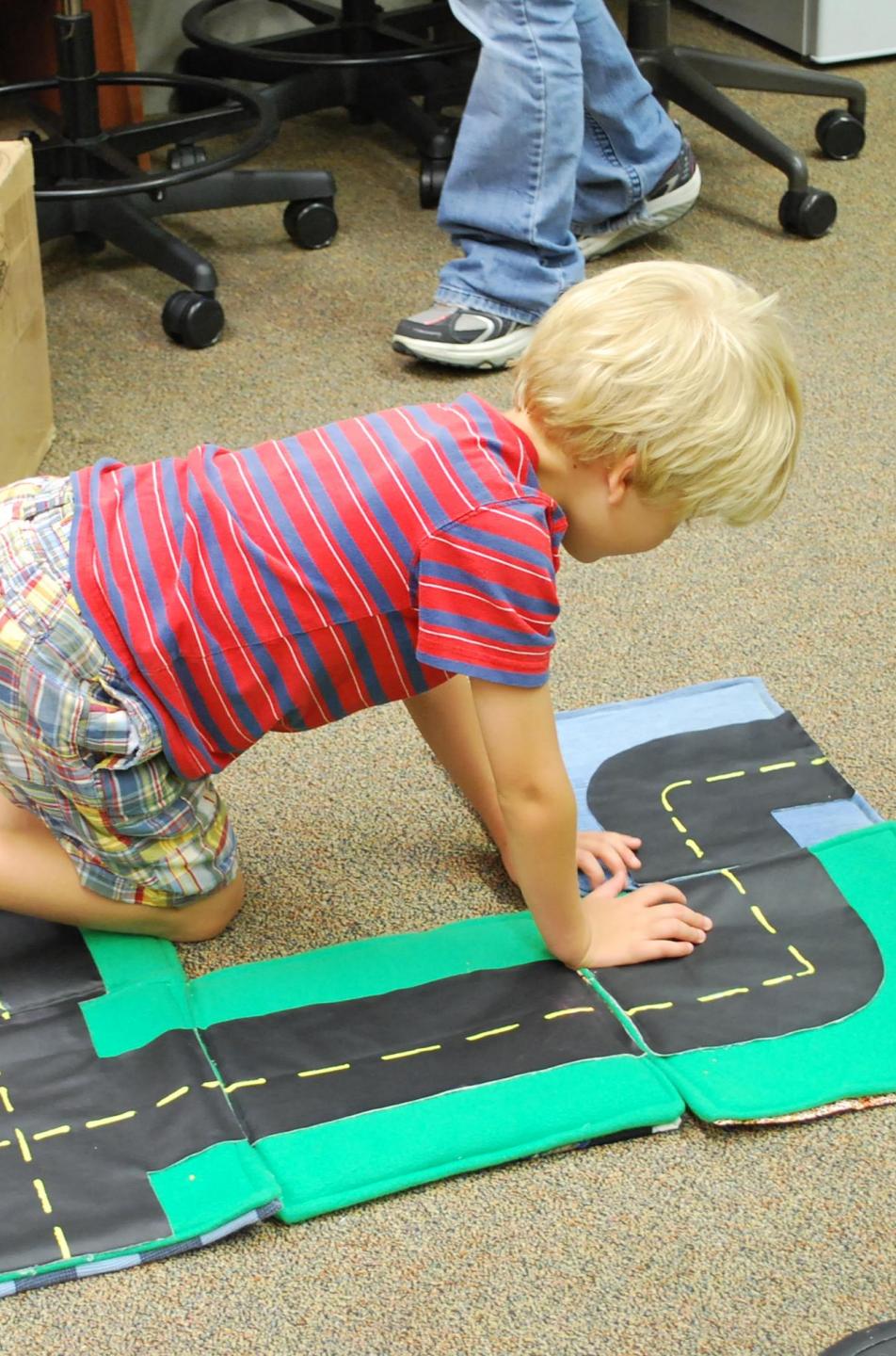


Interviews + Focus Groups

Think-Alouds

Observations





Interviews
+ Focus Groups

Think-Alouds

Observations

Task + Time Studies



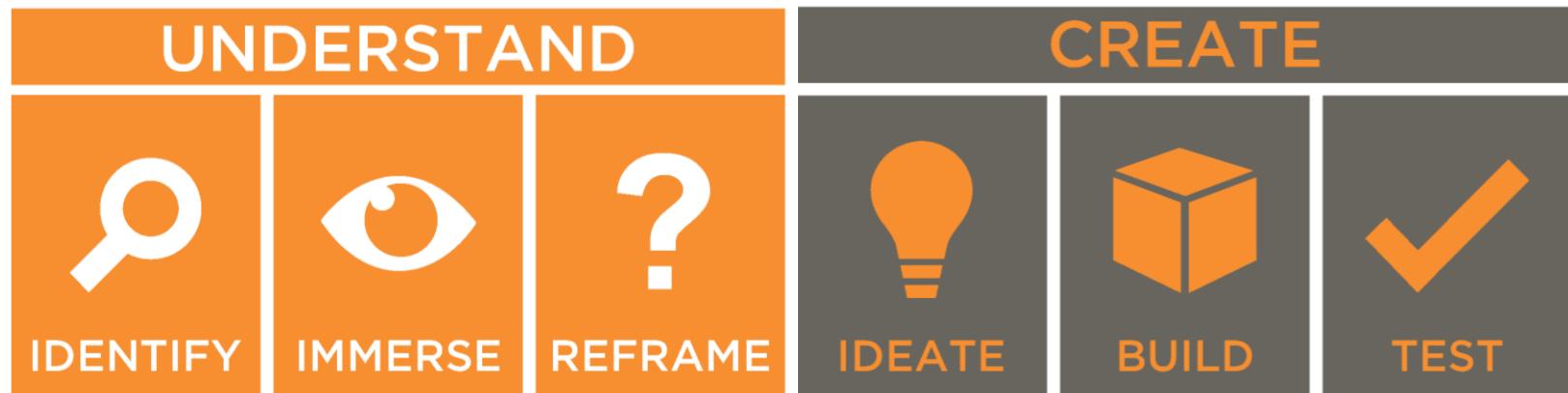


REMEMBER TO DO REAL USER TESTING



Jerry the Bear

Human-Centered Design Thinking Process

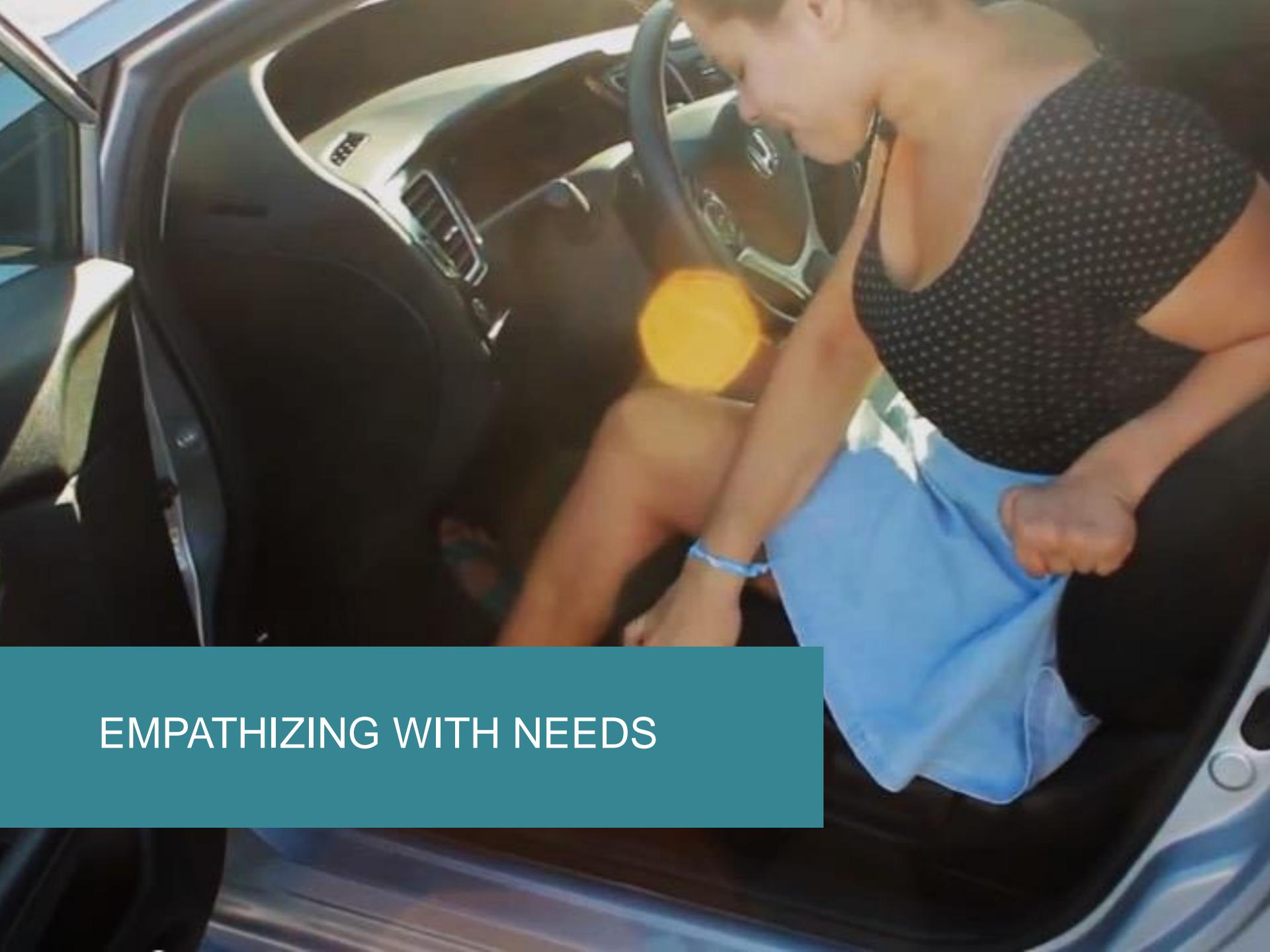




Share
5 minutes



TALKING TO REAL PEOPLE

A photograph of a woman in a black tank top and blue jeans filling up her dark-colored car at a gas station. She is holding a yellow gas canister and a hose. A blue cloth is draped over the side of the car. The background shows the interior of the gas station.

EMPATHIZING WITH NEEDS

ITERATING RAPIDLY



Carlye Lauff, PhD Candidate Mechanical Engineering

Carlye.Lauff@colorado.edu



Medium @carlyelauff

