

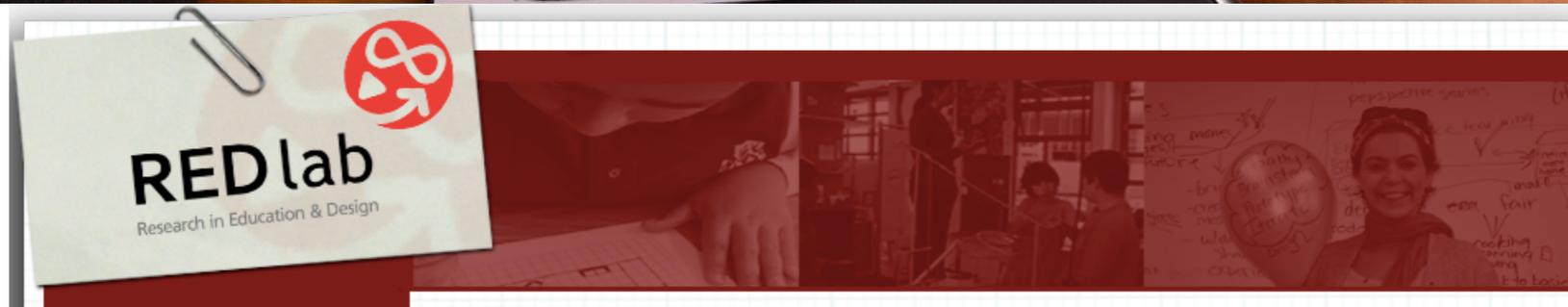
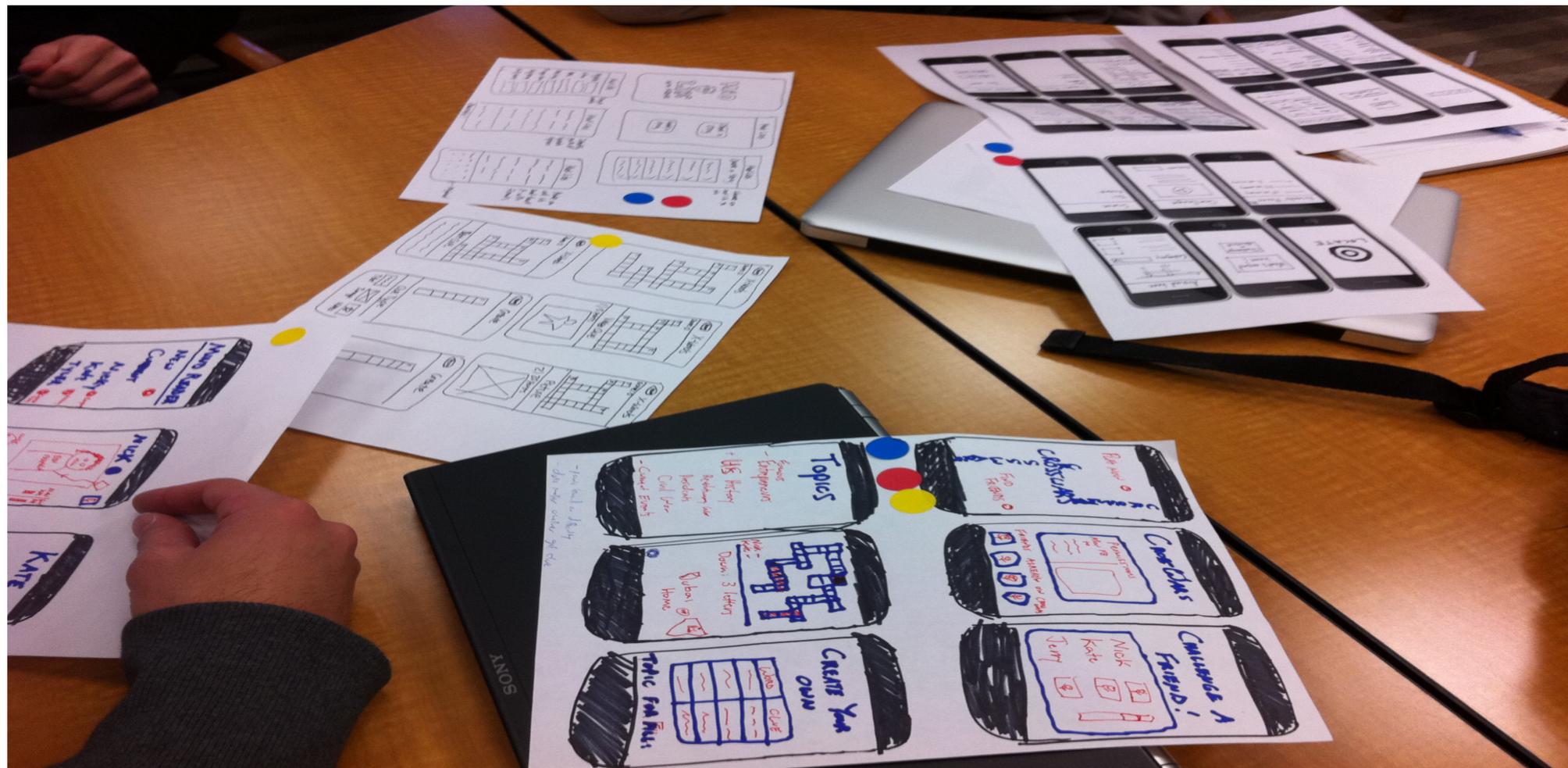
# IGNITE!

an integrated design thinking and STEM curriculum



# A Taste of Design Thinking

# REDESIGNING THE MOBILE EXPERIENCE



Imagine what mobile devices will be in the future.  
AND, Jot your ideas of the ideal mobile experience in  
your design journal.

First, you learn a little about the  
problem space, in this case,  
Your partner's use and needs for  
mobiles....

To solve your design challenge,  
**DESIGNING** the  
**future of mobiles,**  
you need to learn about your  
user by interviewing.

WHY???

TO

BUILD EMPATHY FOR

YOUR USER.

# Develop Empathy and Discover User Needs

Let's ***design*** a solution based on real situations and people's needs.

Interview your partner. Write notes in your design journal.

Circle the needs you think are the most urgent/important for your partner. Create a needs chart in your journal like the one below based on your interview.

USER	NEEDS A WAY TO	BECAUSE
Caring	Spend more time with kid child	because her <sup>child</sup> kid is 2 years old.
Empathetic	commute faster	because she needs to get things done.
Busy	have temporary energy saving solutions	because she lives in a rented house.
<del>Safe</del> Protective	Protect herself and her child	because she needs to save money.
Mother		

# Define

## Writing a **P**oint **o**f **V**iew Statement (**POV**)

Write a statement that captures your partner's needs:

\_\_\_\_\_ needs a way to \_\_\_\_\_  
because \_\_\_\_\_ .



# Prototype

Use materials in the classroom to create a prototype to meet the needs of your partner

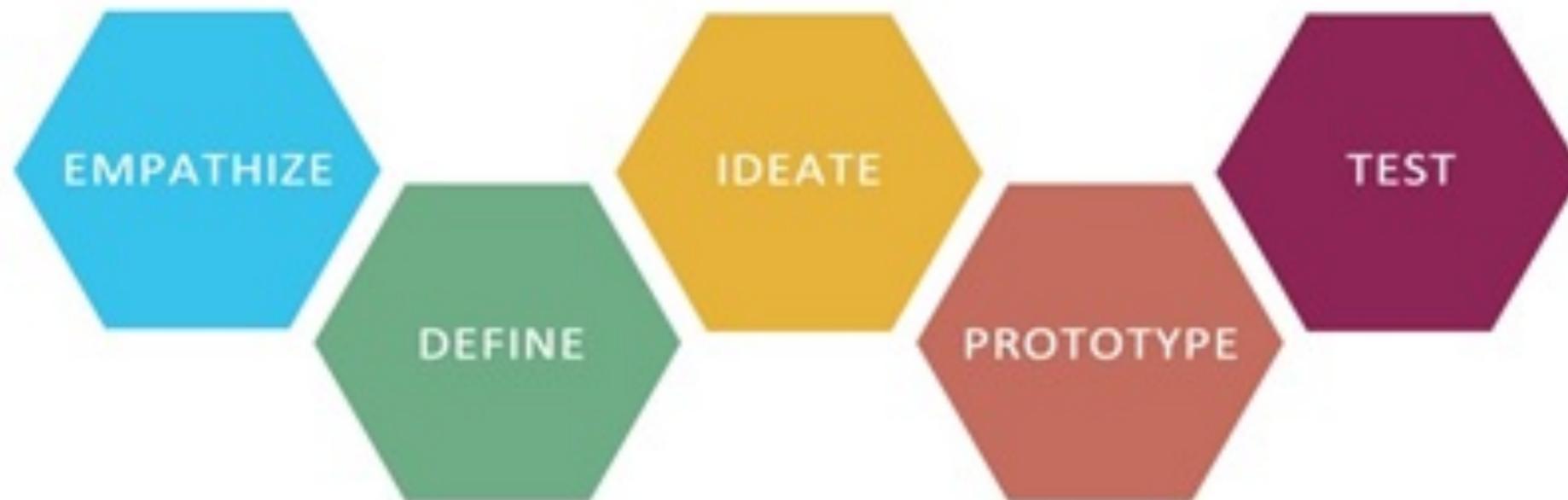
# TEST

Share your prototype with your partner

What worked?

What to improve?

# Design Thinking Steps that we will learn









# A Taste of Design Thinking II

# REDESIGNING the School Cafeteria Experience...



Imagine how you can improve the cafeteria experience at your school. AND, Jot your ideas of the ideal cafeteria experience in your design journal.

This is an example of problem solving. Now let's try a design thinking approach!

First, you learn a little about the  
problem space, in this case,  
Student needs for cafeteria  
time....

To solve your design challenge,  
**REDESIGNING** the  
**cafeteria experience**,  
you need to learn about your  
user by interviewing.

WHY???

TO

BUILD EMPATHY FOR

YOUR USER.

# Develop Empathy and Discover User Needs

- Let's **design** a solution based on real situations and people's needs.
- Interview your partner. Write notes in your design journal.

Circle the needs you think are the most urgent/important for your partner. Create a needs chart in your journal like the one below based on your interview.

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# Define

## Writing a **P**oint **o**f **V**iew Statement (**POV**)

Write a statement that captures your partner's needs:

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to \_\_\_\_\_ because \_\_\_\_\_  
\_\_\_\_\_ .



# Prototype

Use materials in the classroom to create a prototype to meet the needs of your partner

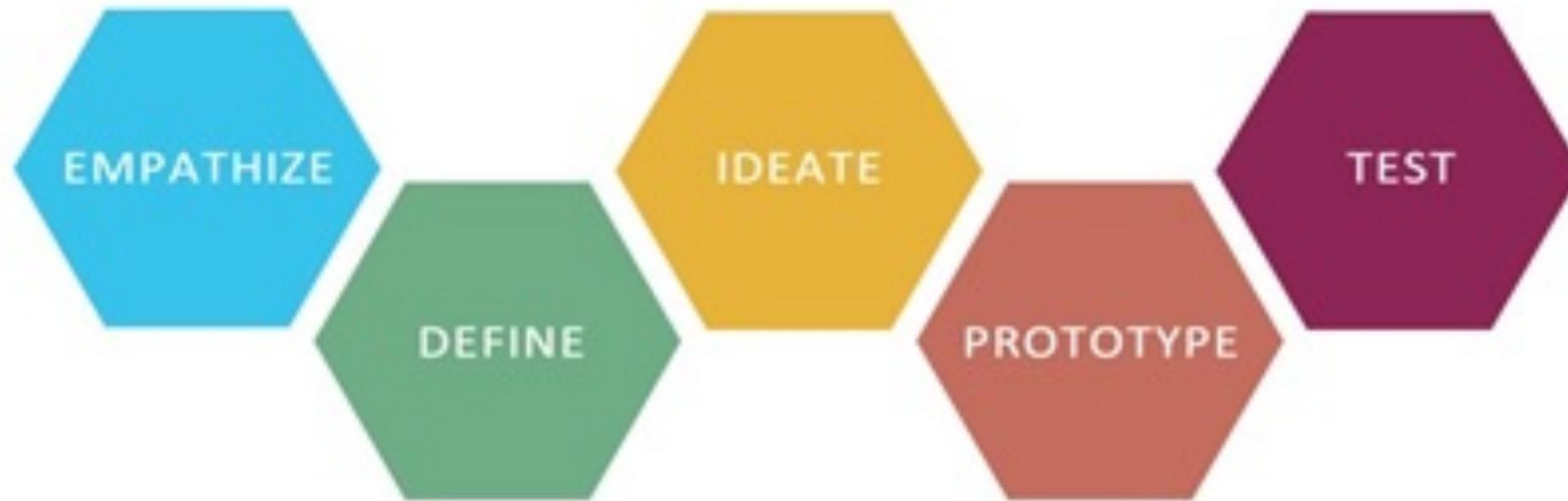
# TEST

Share your prototype with your partner

What worked?

What to improve?

# Design Thinking Steps that we will learn









# Milk Fracking

<http://dangersoffracking.com/>

*What goes in and out of*

## HYDRAULIC FRACTURING

DIVE DOWN



# Coal Extraction

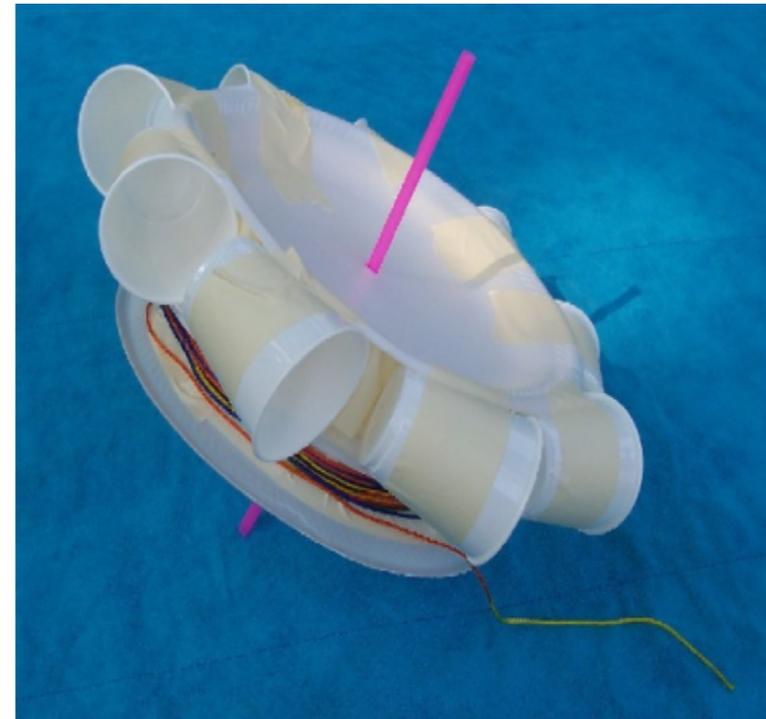
Coal in the earth and how it is extracted

- <http://videos.howstuffworks.com/science-channel/34261-how-do-they-do-it-coal-mining-video.htm>

# How Coal Pollutes the Environment

- [COAL POLLUTING PUGET SOUND?](#)
- [60 Minutes, Powered by Coal](#)

# Harnessing Water for energy



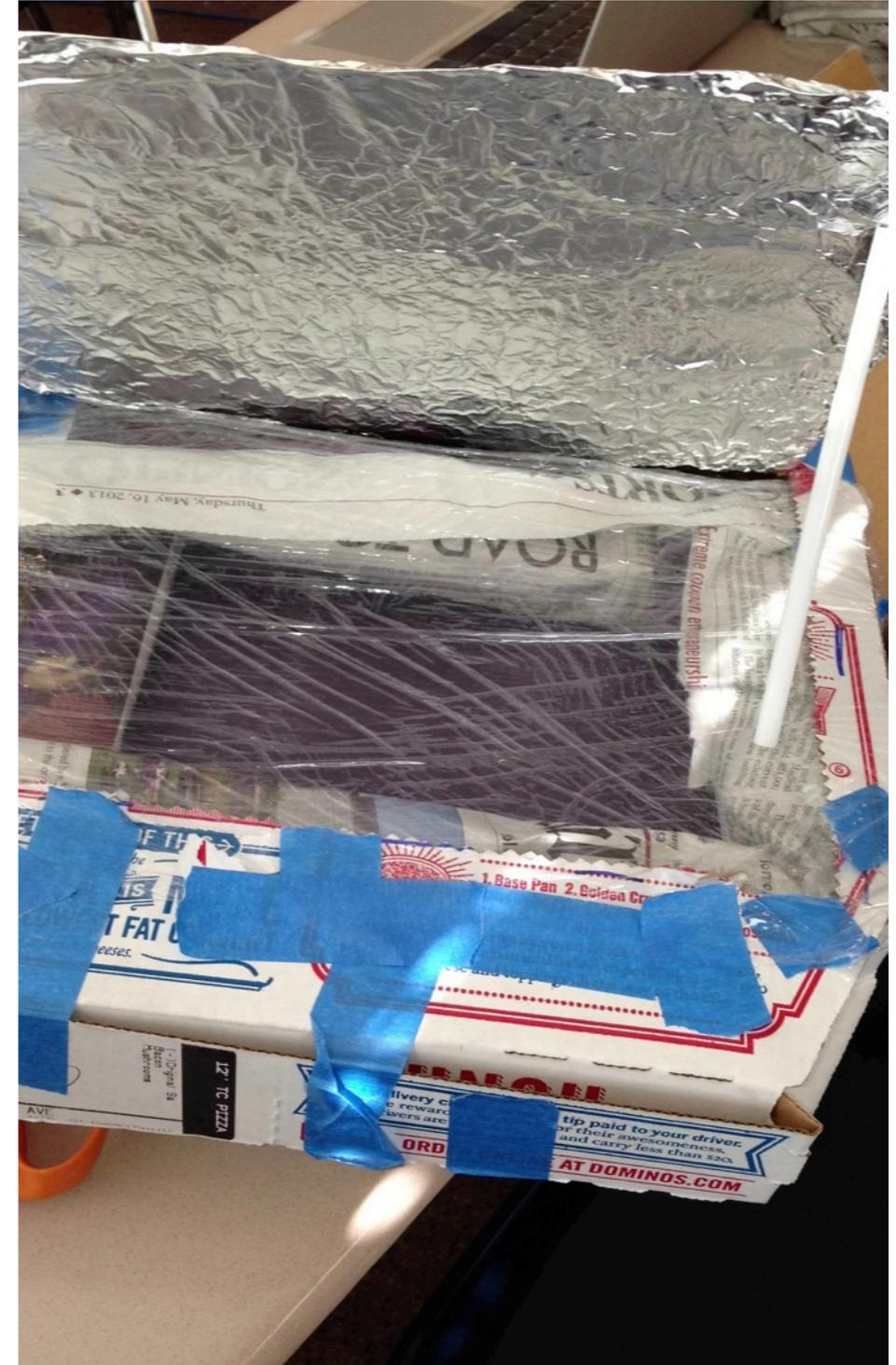
<http://www.youtube.com/watch?v=tpigNNTQi>  
x8

# Falling Water to Energy



[http://www.youtube.com/watch?v=A4UaWt\\_pReY](http://www.youtube.com/watch?v=A4UaWt_pReY)

# Solar Cookers





<http://www.youtube.com/watch?v=TIjuKpbDS44>



<http://www.youtube.com/watch?v=4Zolfh0DWdl>



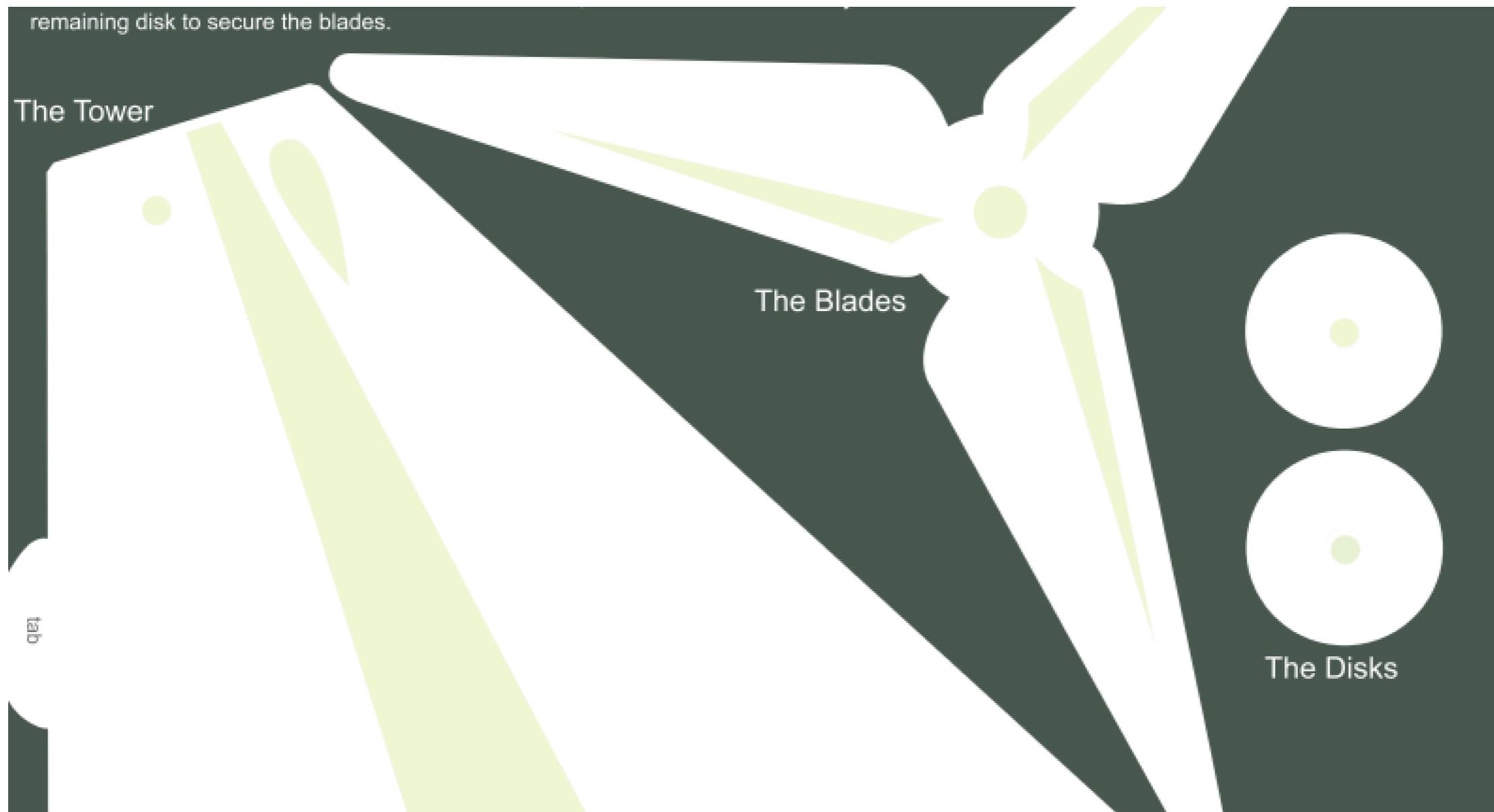
<http://www.youtube.com/watch?v=MajofbAijsl>



<http://www.youtube.com/watch?v=KMNnmv4zGnc>

# Wind Turbine

## How a Wind Turbine Works



# Energy Efficient House



# Tour of Zero Gravity Home

[http://www.youtube.com/watch?v=ZoKYStFy4  
GY](http://www.youtube.com/watch?v=ZoKYStFy4GY)

# Stanford students build zero energy home

- <http://abclocal.go.com/kgo/video?id=9050662&pid=9050661&syndicate=syndicate&section=>

# Hydroelectric dams

<http://www.youtube.com/watch?v=tpigNNTQi>  
[x8](#)







# The International Design Challenge

Designing Access to Energy Sources  
in the developing world



Design thinkers solve

**BIG**

**PROBLEMS.**

But instead of  
designing  
solutions for  
**EVERYONE...**

THEY DESIGN  
SOLUTIONS  
FOR  
ONE PERSON.

THAT PERSON

IS CALLED

THE USER.

To solve your design challenge,  
**DESIGNING ACCESS TO  
ENERGY SOURCES IN  
DEVELOPING WORLD,**  
you need to learn about your user  
by observation and interviewing.

WHY???

TO

BUILD EMPATHY FOR

YOUR USER.

THAT is an important

part of becoming

a people-centered problem solver-

**A DESIGN THINKER.**

Your goal is to develop empathy for  
your user,  
which means putting yourself in  
their shoes.

# What is Empathy?



Empathy is **NOT**

~feeling sorry for someone

~a sense that you have had  
a similar feeling

~being compassionate



A close-up photograph of a wave crashing, showing white foam and blue water. The text "Empathy means..." is overlaid on the left side of the image.

Empathy means...



looking closely....



and listening closely.

and sensing connections that need no words.



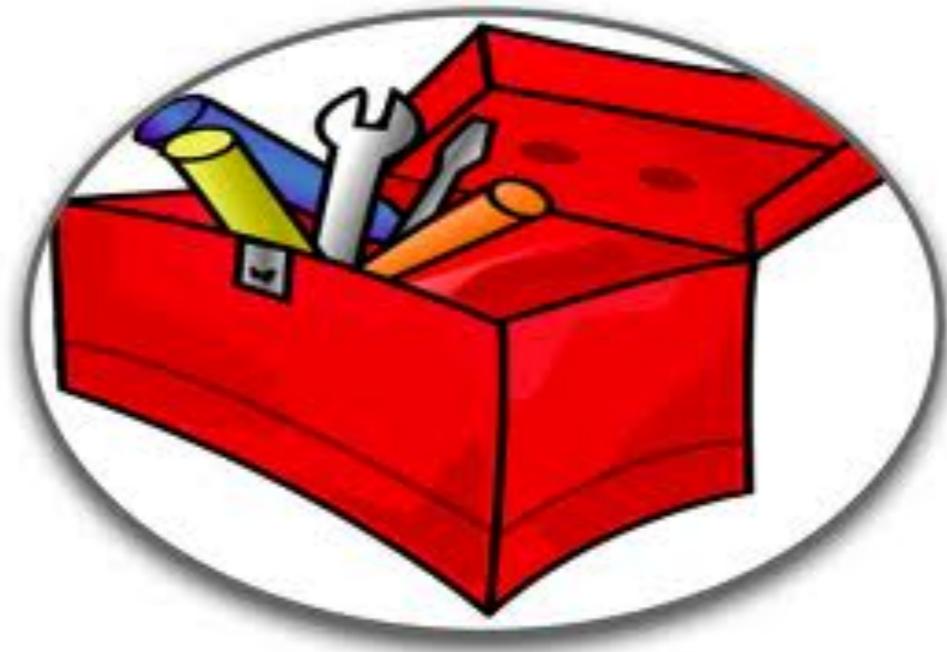
Empathy is feeling what  
someone else feels...





and asking questions about  
what you **THINK** you see.

HOW do you develop  
EMPATHY?



**Your toolbox**



You have to become a GREAT observer!

Your have to observe with fresh eyes.



# How good an observer are you?

Source: <http://www.youtube.com/watch?v=ubNF9QNEQLA>

Describe what you observe in the following pictures.





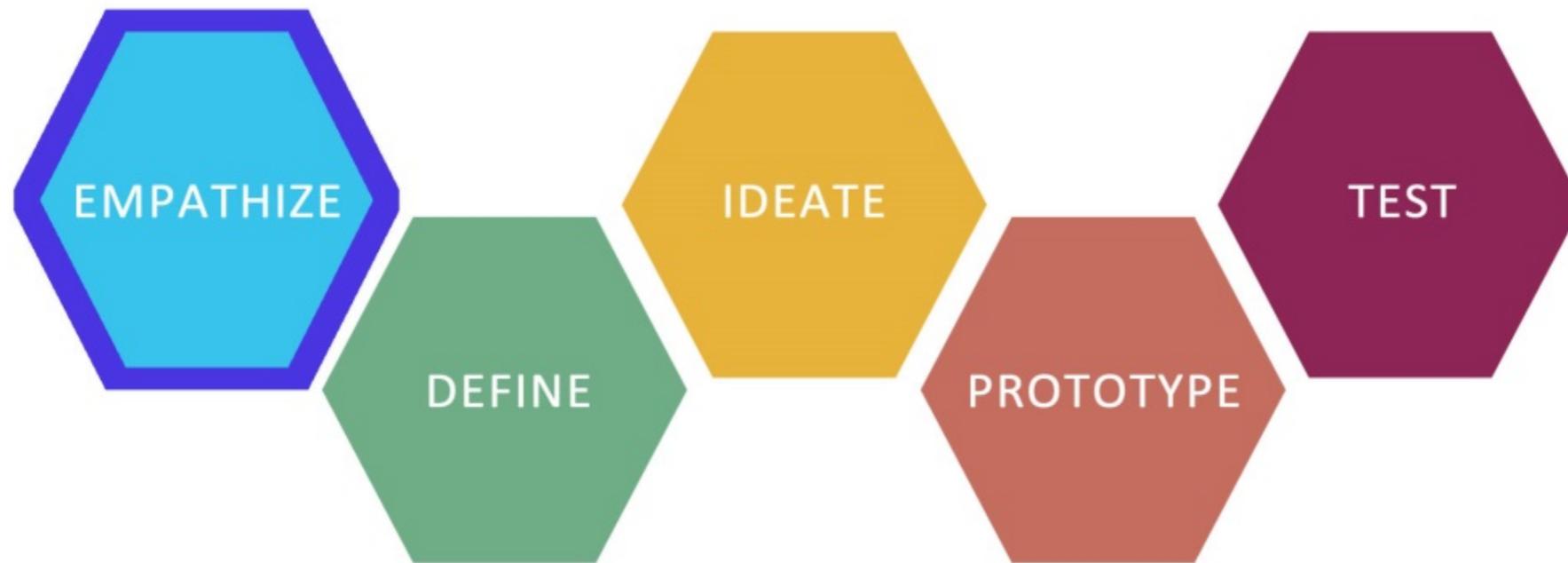




**Summing Up:**

**What makes a good observer?**

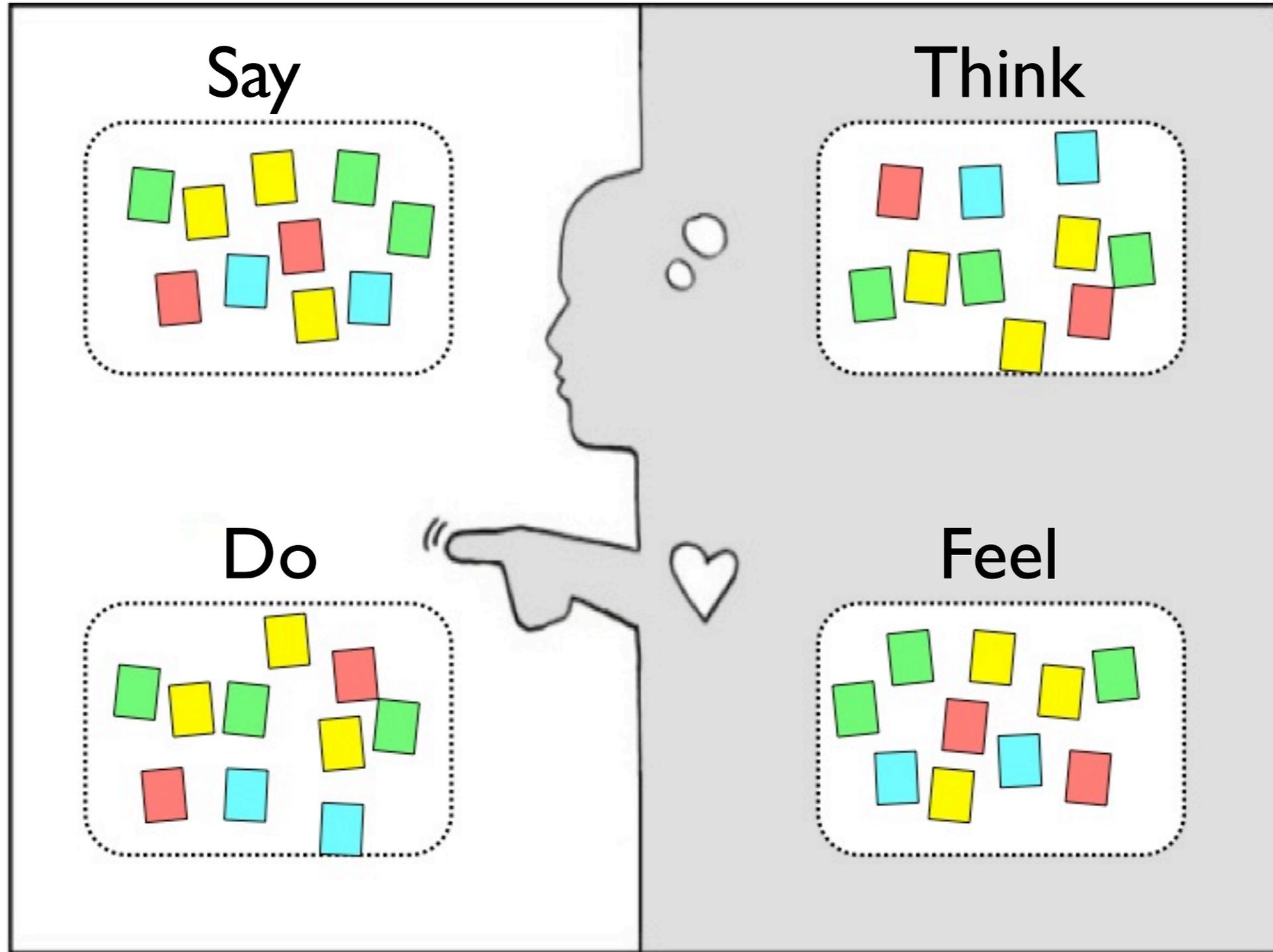
# First step—Building Empathy for the User



# Living Without Lights



# Construct an Empathy Map



# Gana – Life Without Lights

The image is a screenshot of a YouTube video player in a browser window. The browser's address bar shows the URL [www.youtube.com/watch?v=NfSxTa-DGcs](http://www.youtube.com/watch?v=NfSxTa-DGcs). The search bar contains the text "living without lights ghana". The video player itself shows a video with a black screen and a "G TV" logo. Below the video, the title "Life Without Lights" is displayed, along with the channel name "greentvgreentv" and "1,598 videos". The video has "559 views" and "6 likes". The video description reads: "Uploaded on Feb 20, 2012. In Ghana the sun sets at 6pm and rises at 6am which means many communities lacking electricity live half their lives in darkness." To the right of the video player, there is a list of recommended videos, including "How to thrive off the grid with no electricity, car, internet, TV or" by Ka Sundance, "Sustainable Energy for All" by greentvgreentv, "What is IUCN?" by greentvgreentv, "Bridge The Gap, A Global Stoop" by greentvgreentv, "#2thePole: Josefina Skerk" by greentvgreentv, "1ST WORLD PROBLEMS AT SEPHORA" by grav3yardgirl, "LIFE WITHOUT ELECTRICITY/ ЖИЗНЬ БЕЗ ЭЛЕКТРИЧЕСТВА" by Viktoryia Kolchyna, and "Nikola Tesla The Master of Electricity" by timolov.

# India – Kerosene Lamps

The image is a screenshot of a YouTube video player within a browser window. The browser's address bar shows the URL [www.youtube.com/watch?v=CWjwpEc8q4g](http://www.youtube.com/watch?v=CWjwpEc8q4g). The video title is "Solar lighting in India with d.light design" by the channel "thischristianaid", which has 694 videos and 1,023 views. The video player shows a woman in a sari standing in a room with a brick wall and a white bucket. The video progress is at 1:54 out of 7:58. Below the video, there are options to Like, About, Share, Add to, and a description: "Uploaded on Aug 4, 2011. This video shows the long-term benefits that sustainable lighting brings to school children and others." To the right of the video player is a list of recommended videos, including "London to Paris Bike Ride 2011 with Christian Aid", "Christian Aid: Creating unity in post conflict Burundi", "Christian Aid Week 2011: The Barista Bishop", "Christian Aid: A different view of poverty", "Assemble Your Own Solar Lantern (India)", "Solar Powered Lights (d.light)", "D.light Design, solar lanterns lighting up the world - Ashden", and "D.light's Customers in India Love Solar Lanterns with Mobile".

# Solar lights in India

QuickTime Player File Edit View Share Window Help Stop Recording (100%) Mon Apr 29 12:27 AM

Solar lighting in India with x

www.youtube.com/watch?v=CWjwpEc8q4g

Stanford Coursework Gmail News ServiceSpace ZenHabits CCARE TED Mint SparkTruck Greater Good Somewhere Over Th Other Bookmarks

YouTube d.light presentation india Upload Tim Huang 1

GUIDE

MORE RESULTS  
d.light presentation in...



1:54 / 7:58

### Solar lighting in India with d.light design

thischristianaid · 694 videos 1,023

Subscribe 669

Like About Share Add to

Uploaded on Aug 4, 2011  
This video shows the long-term benefits that sustainable lighting brings to school children and others.

London to Paris Bike Ride 2011 with Christian Aid  
by thischristianaid 1,025 views 1:34

Christian Aid: Creating unity in post conflict Burundi  
by thischristianaid 453 views 5:34

Christian Aid Week 2011: The Barista Bishop  
by thischristianaid 545 views 1:34

Christian Aid: A different view of poverty  
by thischristianaid 333 views 4:52

Assemble Your Own Solar Lantern (India)  
by belfaltechnologies 17,624 views 4:52

Solar Powered Lights (d.light)  
by Rishi Gangoly 711 views 3:22

D.light Design, solar lanterns lighting up the world - Ashden  
by AshdenAwards 10,250 views 6:13

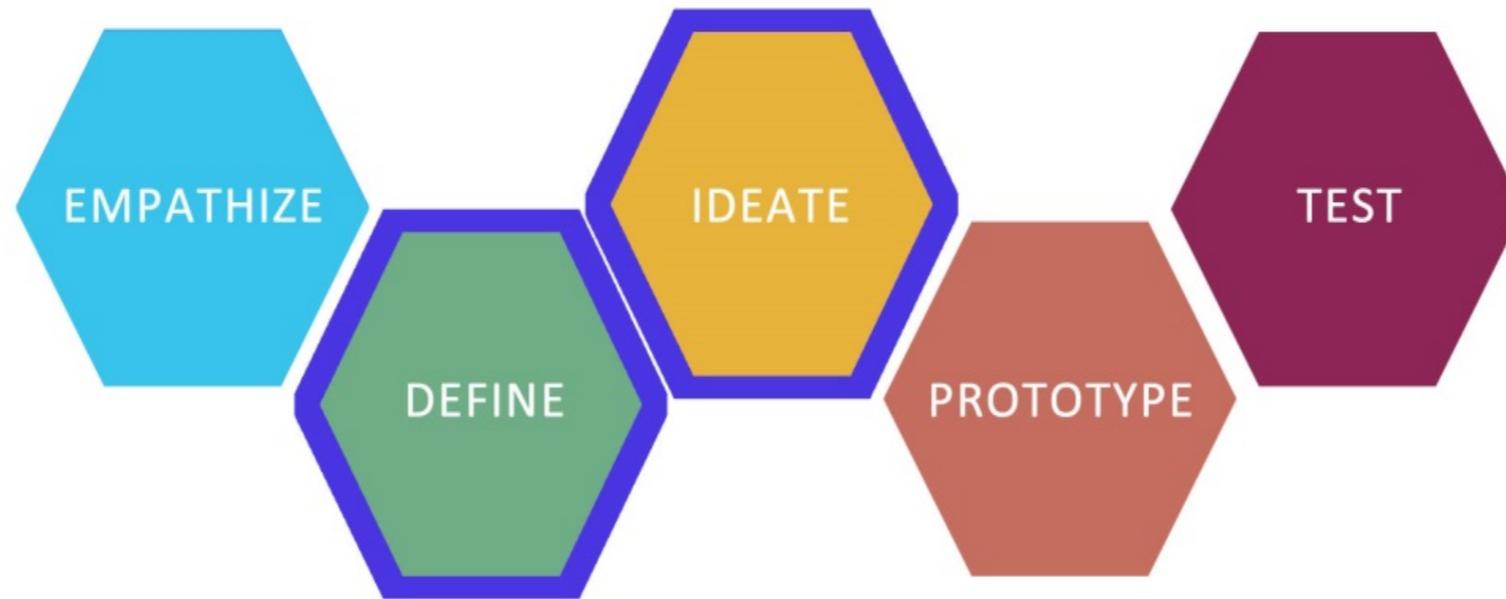
D.light's Customers in India Love Solar Lanterns with Mobile  
by quipacourusam

# Ghana and India Videos Debriefing Worksheet – Your Empathy Map

Think

Feel

# Part 2: Point of View Statement and Ideation



# WHAT DO YOU DO WITH YOUR INTERVIEW DATA?

**Create a Point of View Statement.**

# POINT OF VIEW STATEMENT

\_\_\_\_\_ needs a way to \_\_\_\_\_  
(User name) (Verb)

because \_\_\_\_\_.  
(Surprising Insight)

# Neema: New Teacher



Source: <http://i.pinimg.com/3144538-hd.jpg>

<http://www.youtube.com/watch?v=ewlHN9SGuv0>  
(0:47-1:18)

# POINT OF VIEW STATEMENT

\_\_\_\_\_ needs a way to \_\_\_\_\_  
(User name) (Verb)

because \_\_\_\_\_.  
(Surprising Insight)



Shanda: First Year Teacher

<http://www.youtube.com/watch?v=kcfD0GDKYiA&feature=related>

(0:27-1:22)

# POINT OF VIEW STATEMENT

\_\_\_\_\_ needs a way to \_\_\_\_\_  
(User name) (Verb)

because \_\_\_\_\_.  
(Surprising Insight)

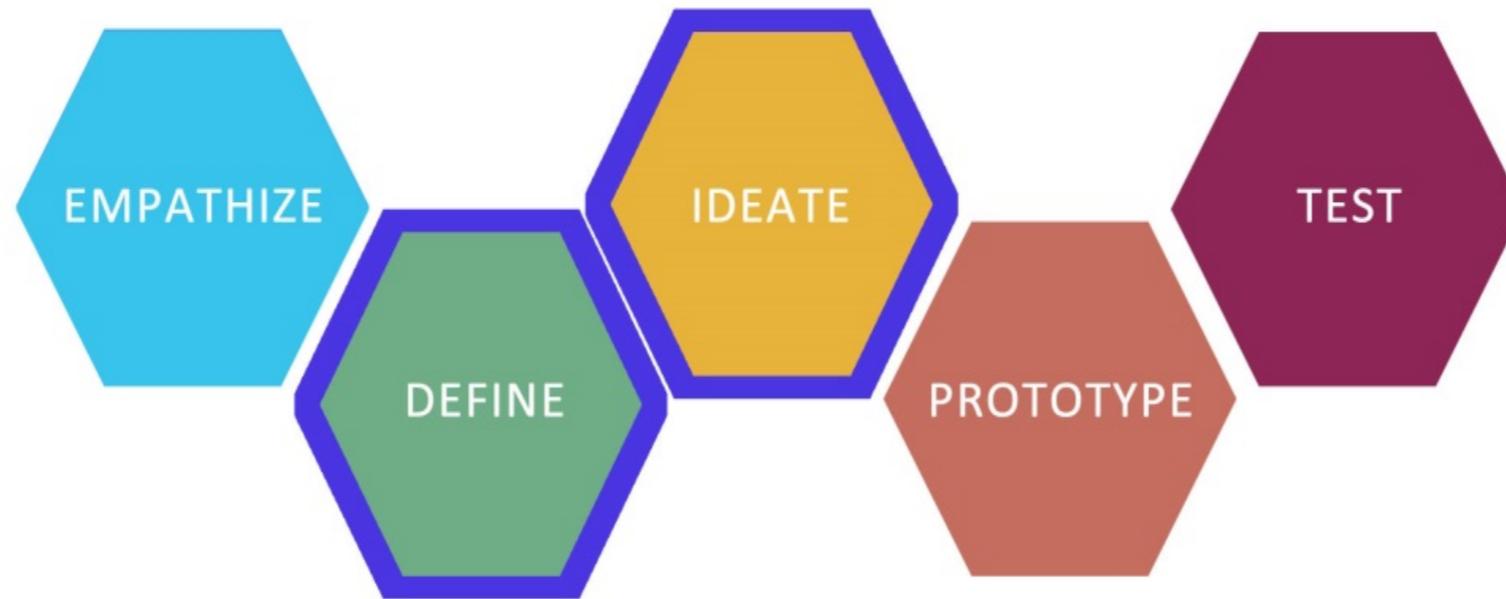
Design thinkers

are

PEOPLE-CENTERED

PROBLEM SOLVERS.

# Ideation



# IDEATE Slide Here

- Ideation/brainstorming having many ideas that could be solutions for meeting the needs of your users

# BRAINSTORMING MINDSETS

# Build on the ideas of your team!



Source: [http://www.childrenofbukati.com/photos/photo\\_2010\\_gymnastics\\_pyramid2.jpg](http://www.childrenofbukati.com/photos/photo_2010_gymnastics_pyramid2.jpg)

Go for wild ideas!



Source: <http://sdzsafaripark.tumblr.com/post/13176848753/cheetah-cub-on-flickr-cheetah-cubs-have-a-long>

Don't judge other's ideas... or your own!



Source: <http://www.pbs.org/newshour/rundown/2011/07/health-care-reform-marches-closer-to-supreme-court.html>

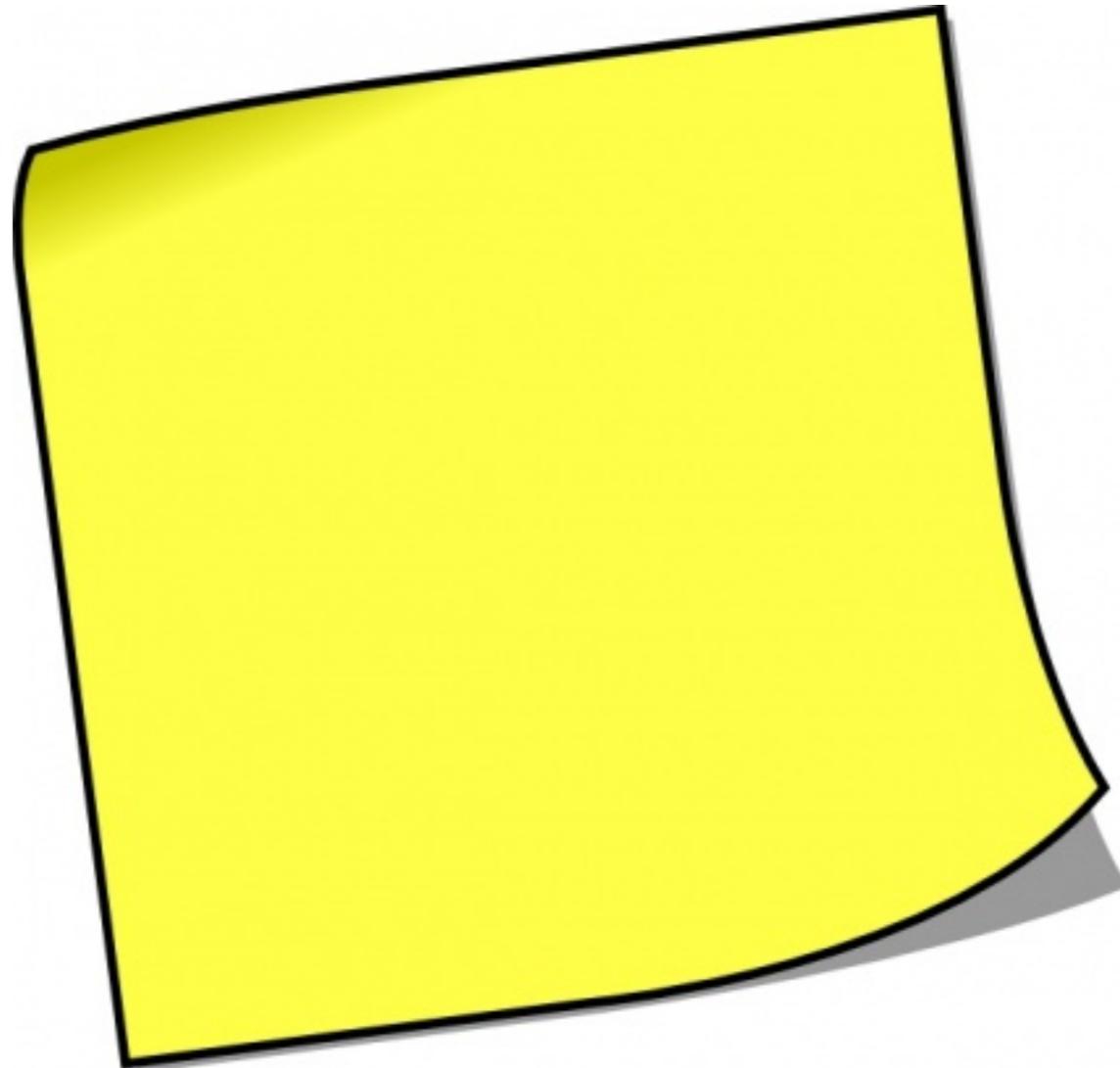
Go for quantity!



**Listen to others:  
only 1 person talks at a time!**



Keep your idea short-  
it has to fit on a post-it note!



Capture **EVERY SINGLE IDEA!**



# HOW MIGHT WE?s

Neema, a nervous first year teacher, needs a way to feel confident, because he wants to do a good job as a new teacher.

**How might we help Neema feel confident?**

Neema needs a way to remember his lessons, because he gets confused when everyone is staring at him.

**How might we help Neema remember his lessons?**

Shanda, a new teacher, needs a way to make her students enjoy learning because she wants them to have as much fun as she did when she was a student.

**How might we help Shanda find a way to make learning fun for her students?**

Shanda needs a way to feel prepared for her first day of teaching because she is nervous about having her first class of students.

**How might we help Shanda feel better prepared for her first day?**

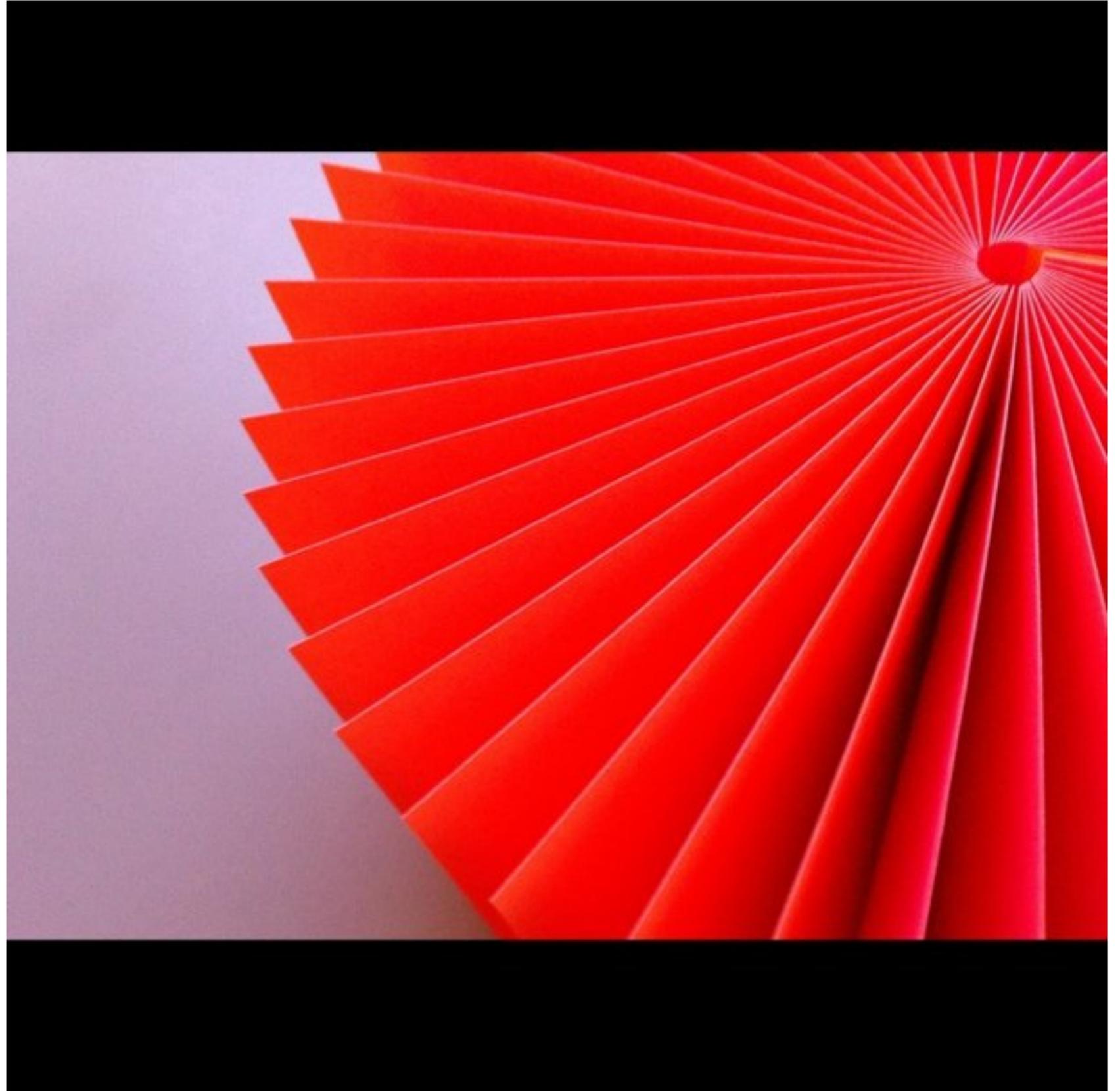
# HOW TO BRAINSTORM

1. Say your idea.

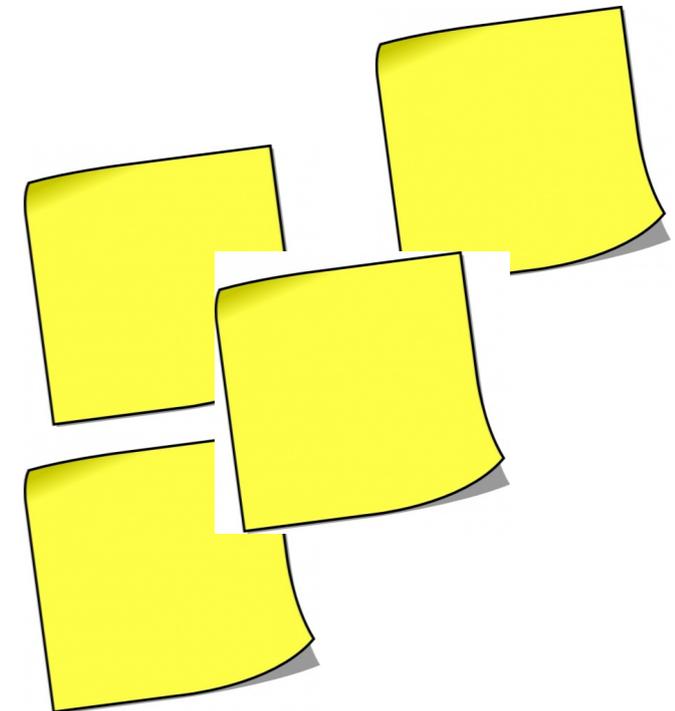
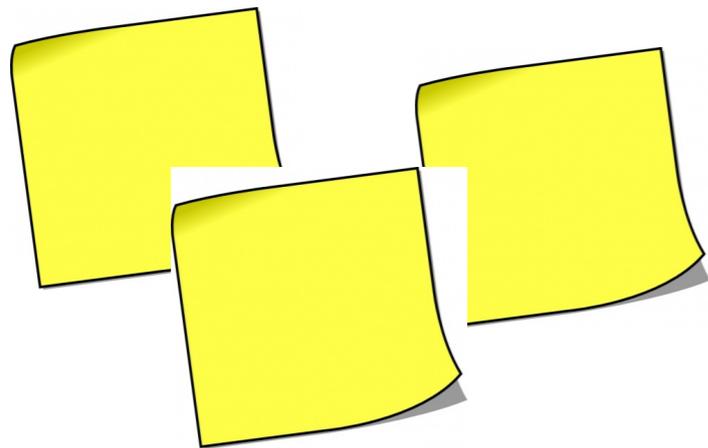
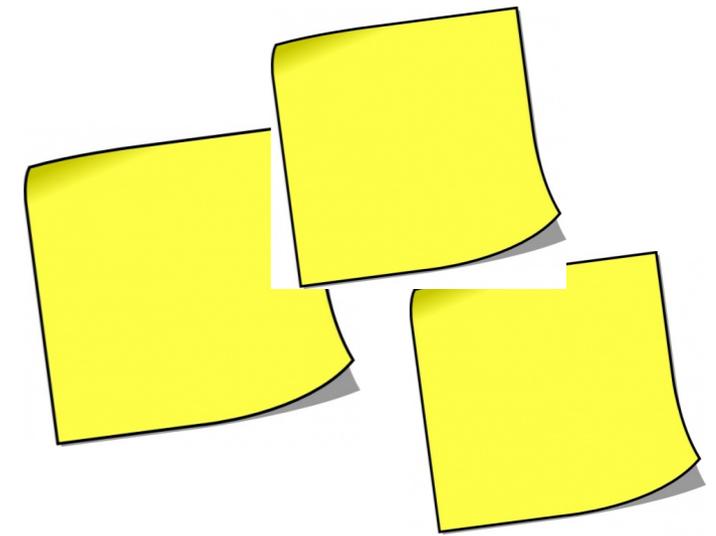
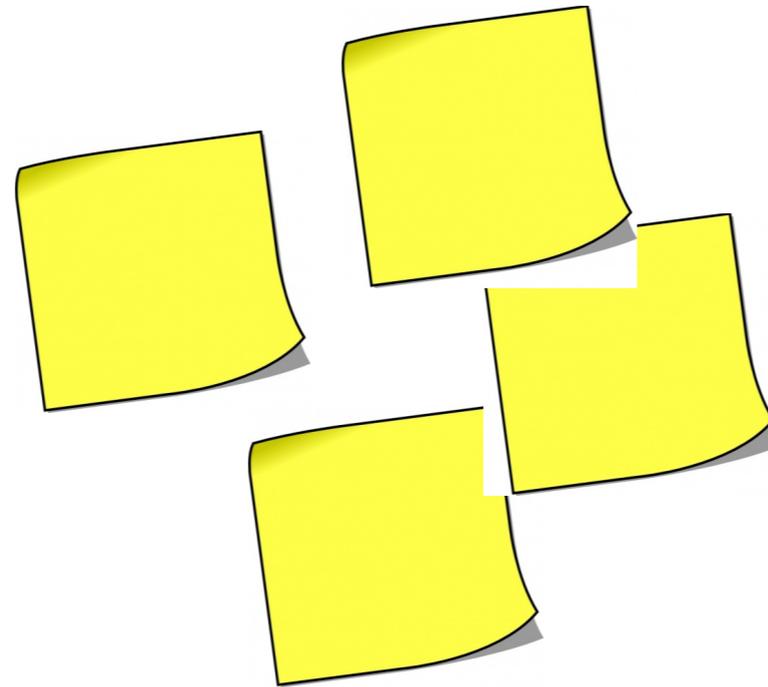
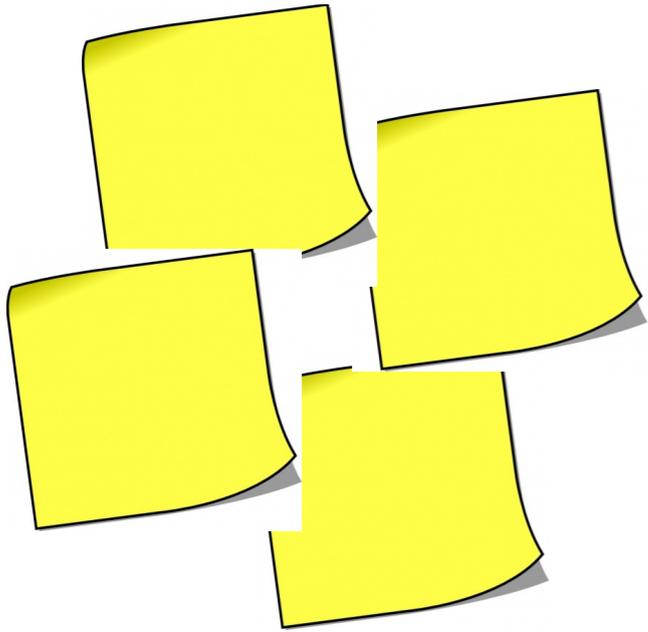
2. Write your idea on a post it note.

3. Stick it on a wall.

# Idea Clustering



Rearrange your post-it notes into clusters by themes.



## Idea Selection

Place a check mark  
next to your 3  
favorite ideas.

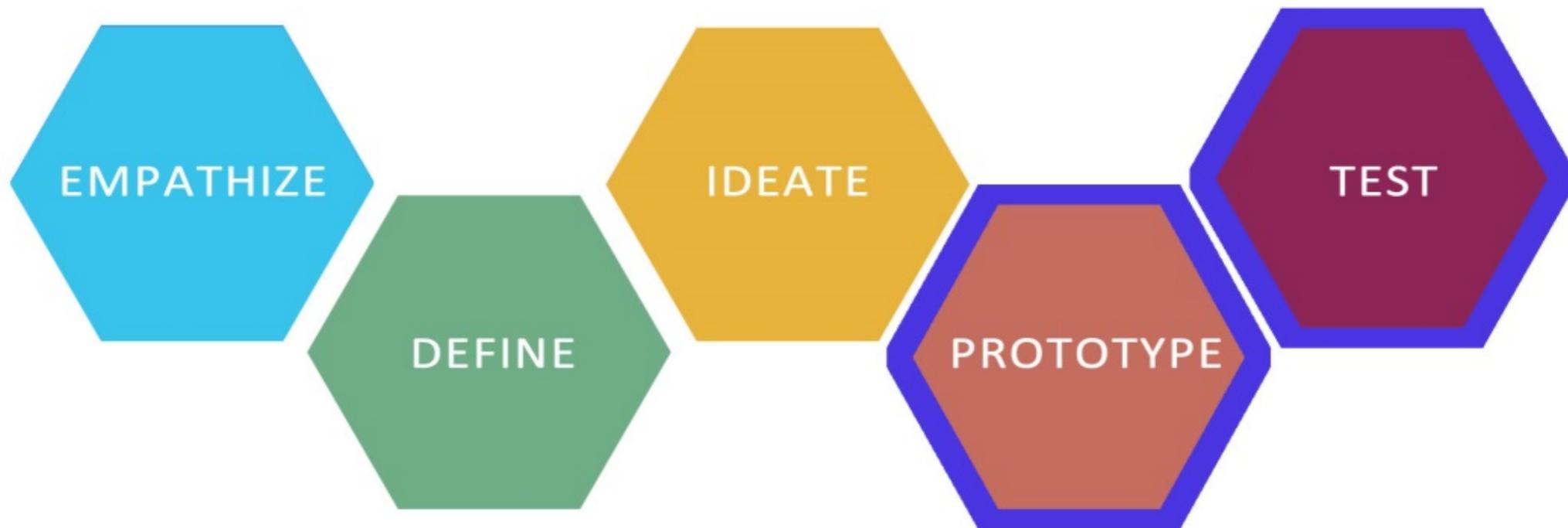


# Idea Sharing

A photograph of a beach with waves crashing onto the sand. The water is a deep teal color, and the foam is white and frothy. The sand is a light brown color. The text "Share your group's top 3 ideas." is overlaid on the bottom part of the image.

Share your group's top 3 ideas.

# Part 3: Prototyping & Testing



# A PROTOTYPE

...is **NOT** a model.

...does not have to **LOOK** or **BE** perfect.

...does have to give your user something to **INTERACT** with.

...does have to be something that gives your user an experience.

**BUILD YOUR  
PROTOTYPES.**

# TEST

- Share your prototype with your partner

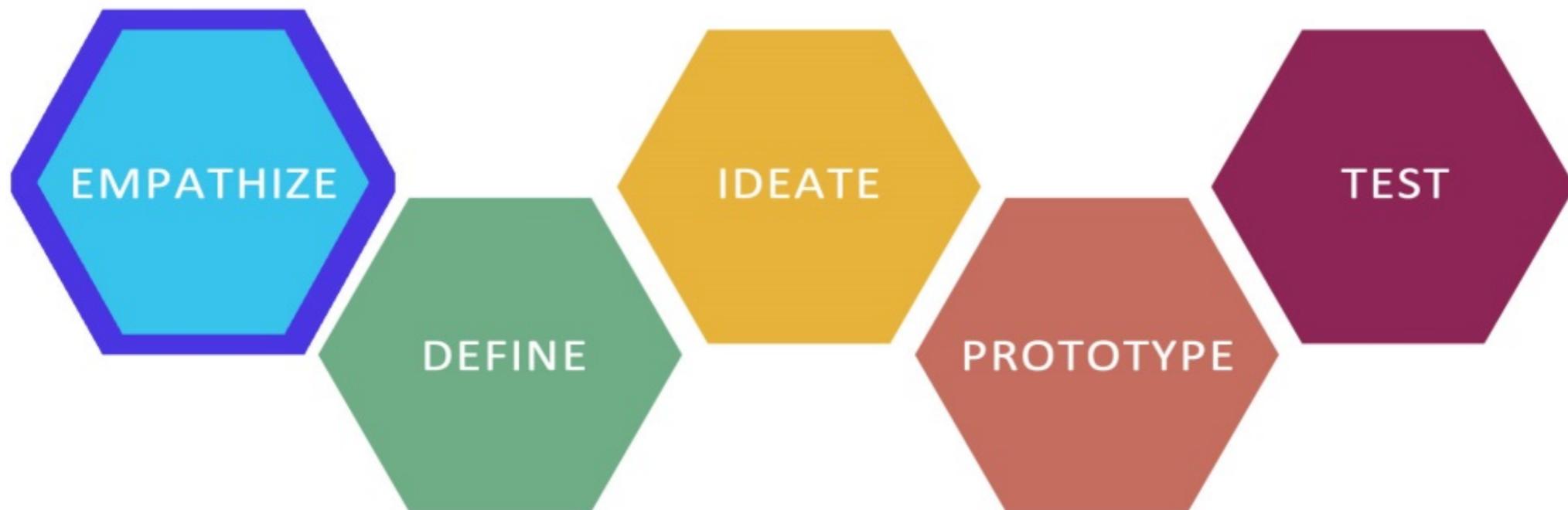
What worked?

What to improve?

# Presentation of Prototypes



# Part 4: More on Empathy and Learning how to Interview



Each team should come up  
with a list entitled:

**“HOW TO BE A GREAT  
INTERVIEWER!”**

You are going to use what you learned now as you  
**INTERVIEW YOUR USERS.**

Let's practice by doing some

**ROLE PLAYING.**

# GALLERY WALK DIRECTIONS

**EACH PERSON has 3 stars.**

**Walk around the room and read each  
group's list.**

**Draw a star on YOUR 3 FAVORITE  
IDEAS.**

# Practicing Observation Skills

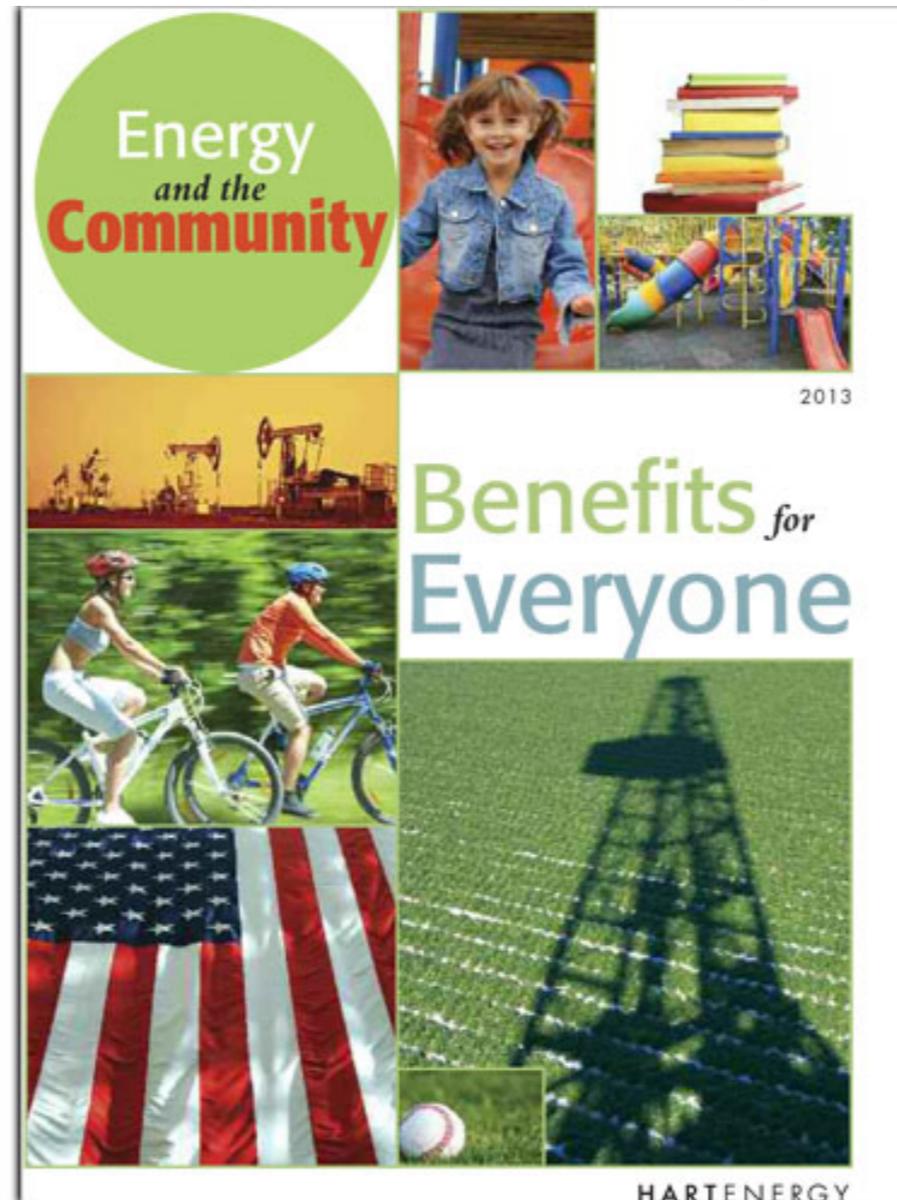
- <http://www.youtube.com/watch?v=vJG698U2Mvo>







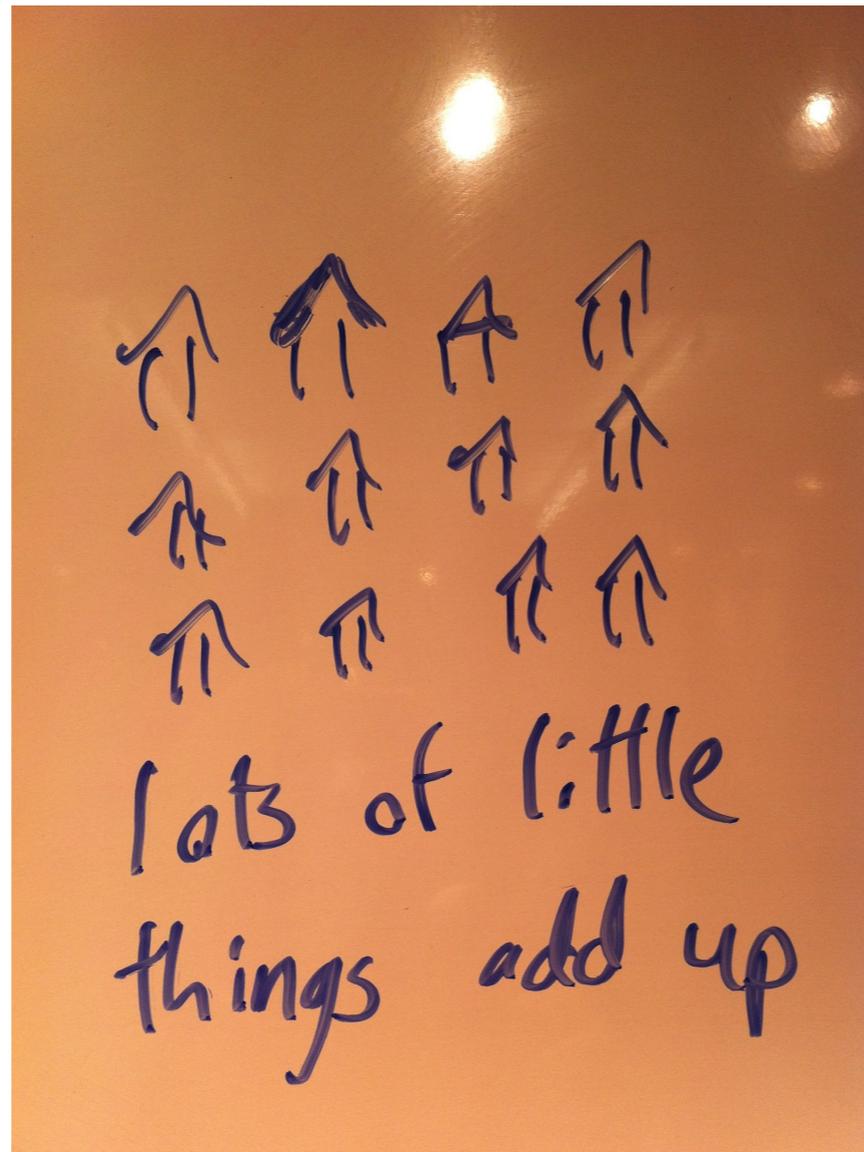
# The Community Design Challenge



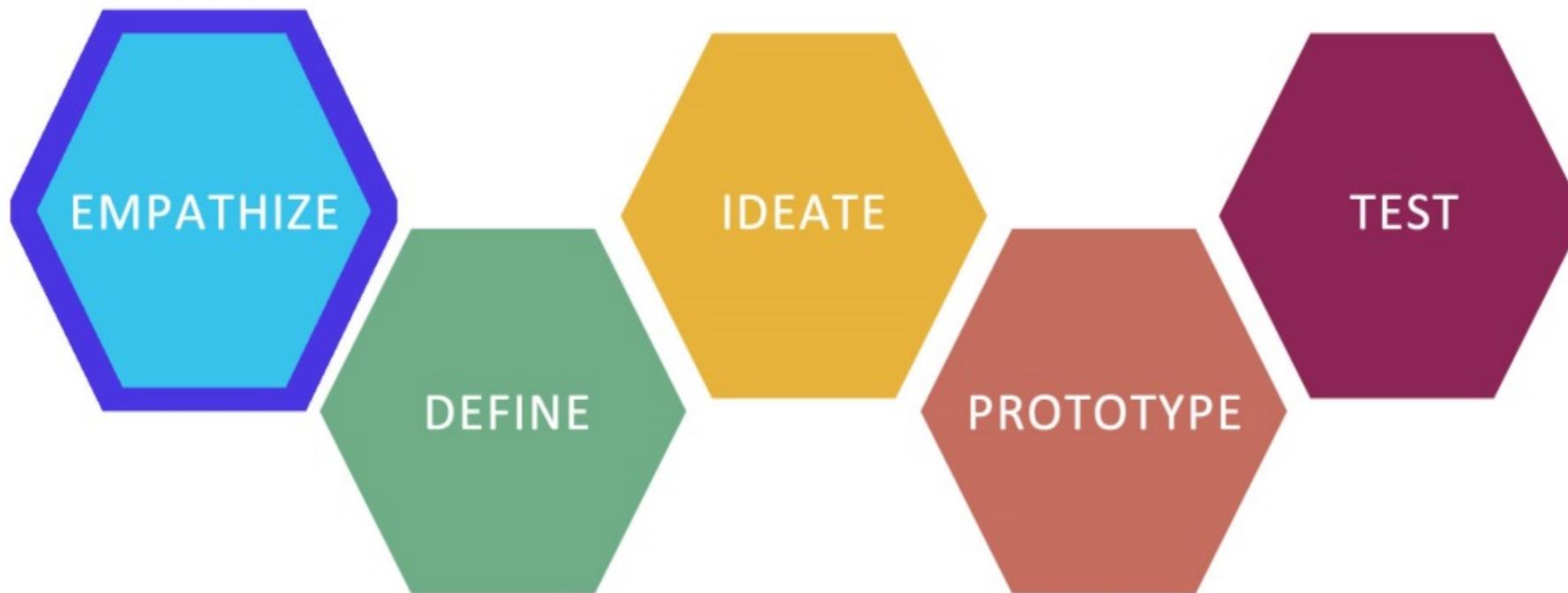
Your DESIGN CHALLENGE is...

Redesigning Energy Conservation  
Locally

Because, small energy  
conservation actions by many  
can have large impacts



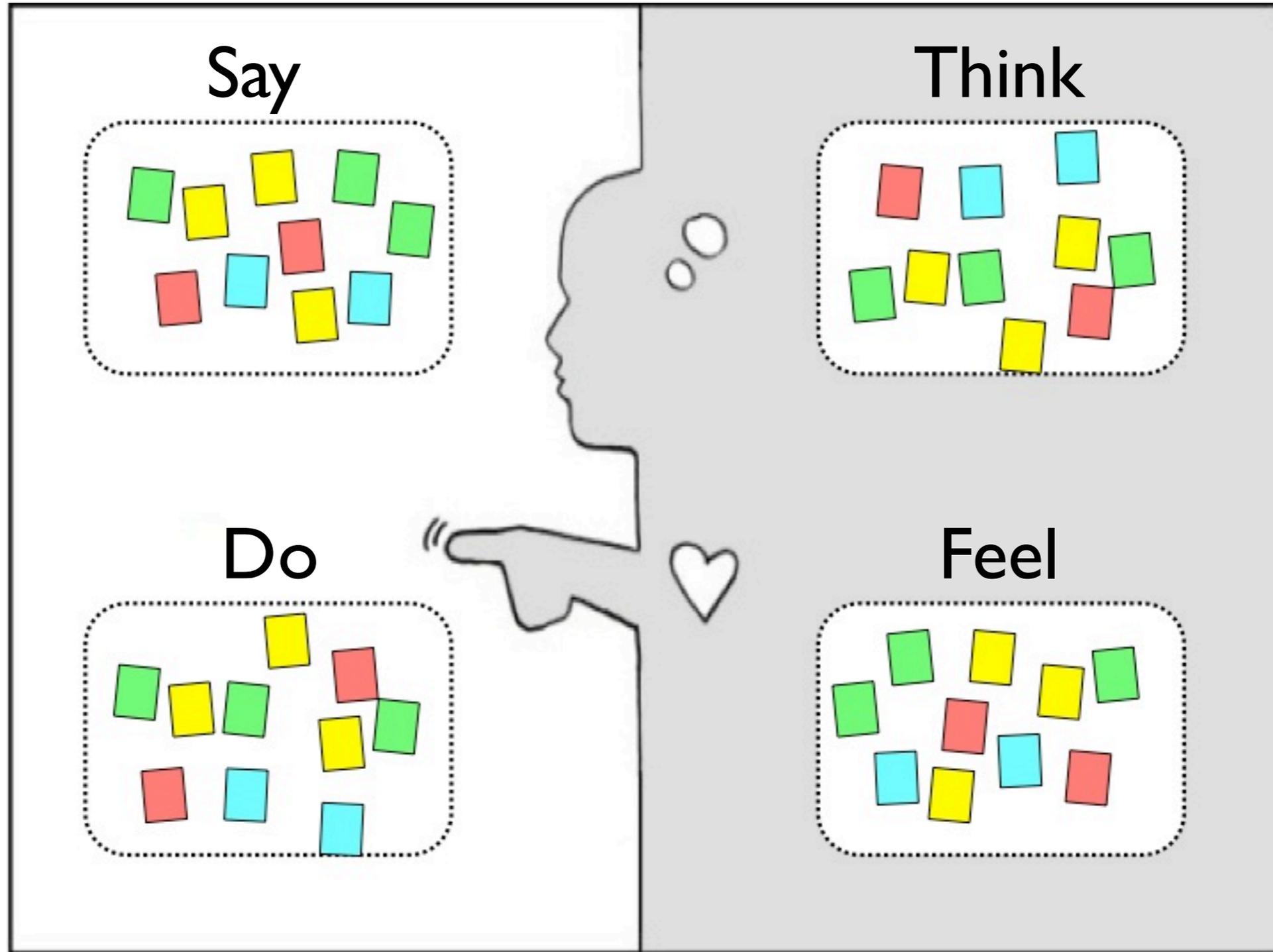
# Empathy



# Interview Practice

<http://www.youtube.com/watch?v=YwY9I38ouxE>

# Construct an Empathy Map



It is time to  
**INTERVIEW**  
**YOUR USERS.**

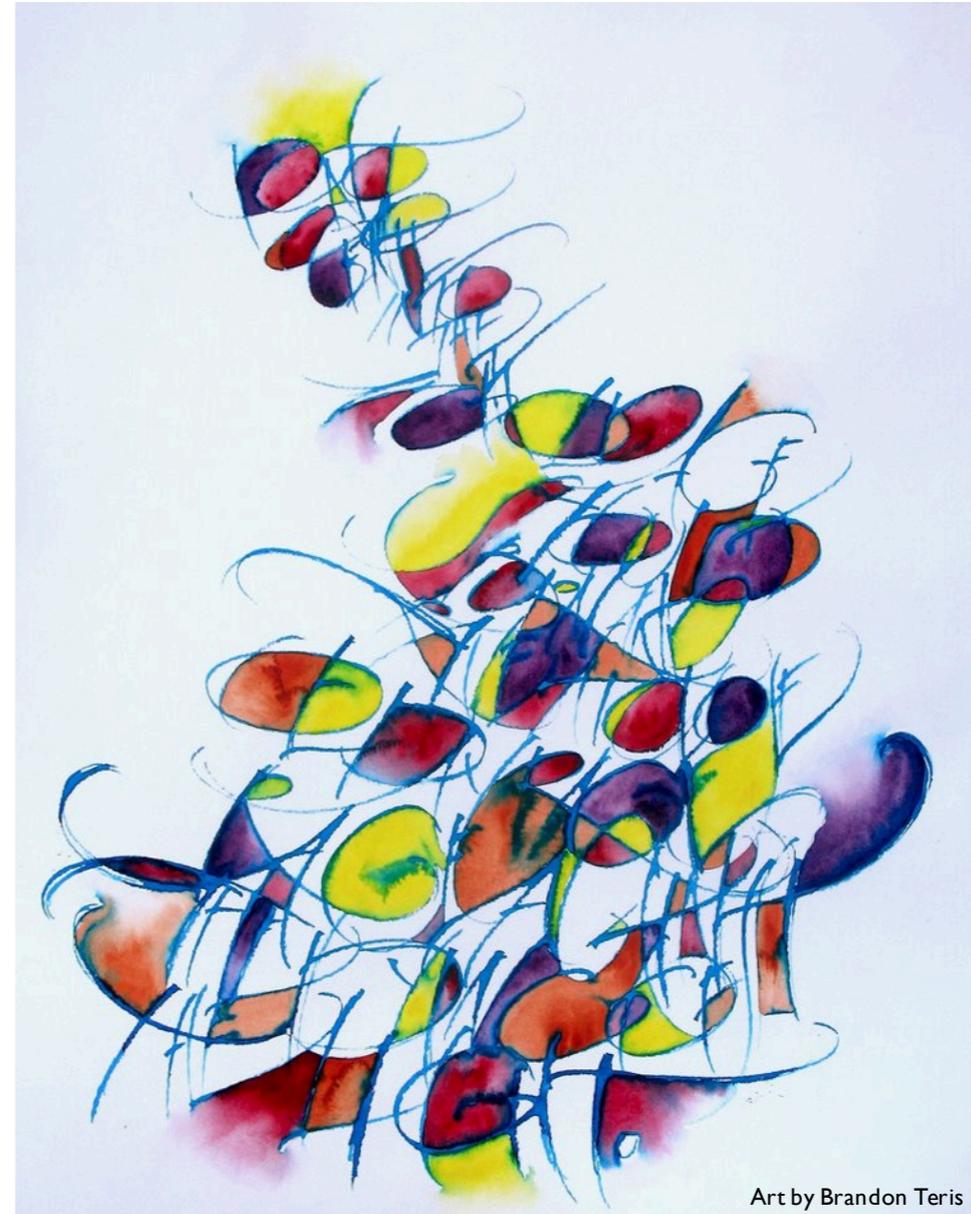
# START YOUR INTERVIEWS!

Remember:

Go for stories!

Ask open-ended questions.

Ask why.

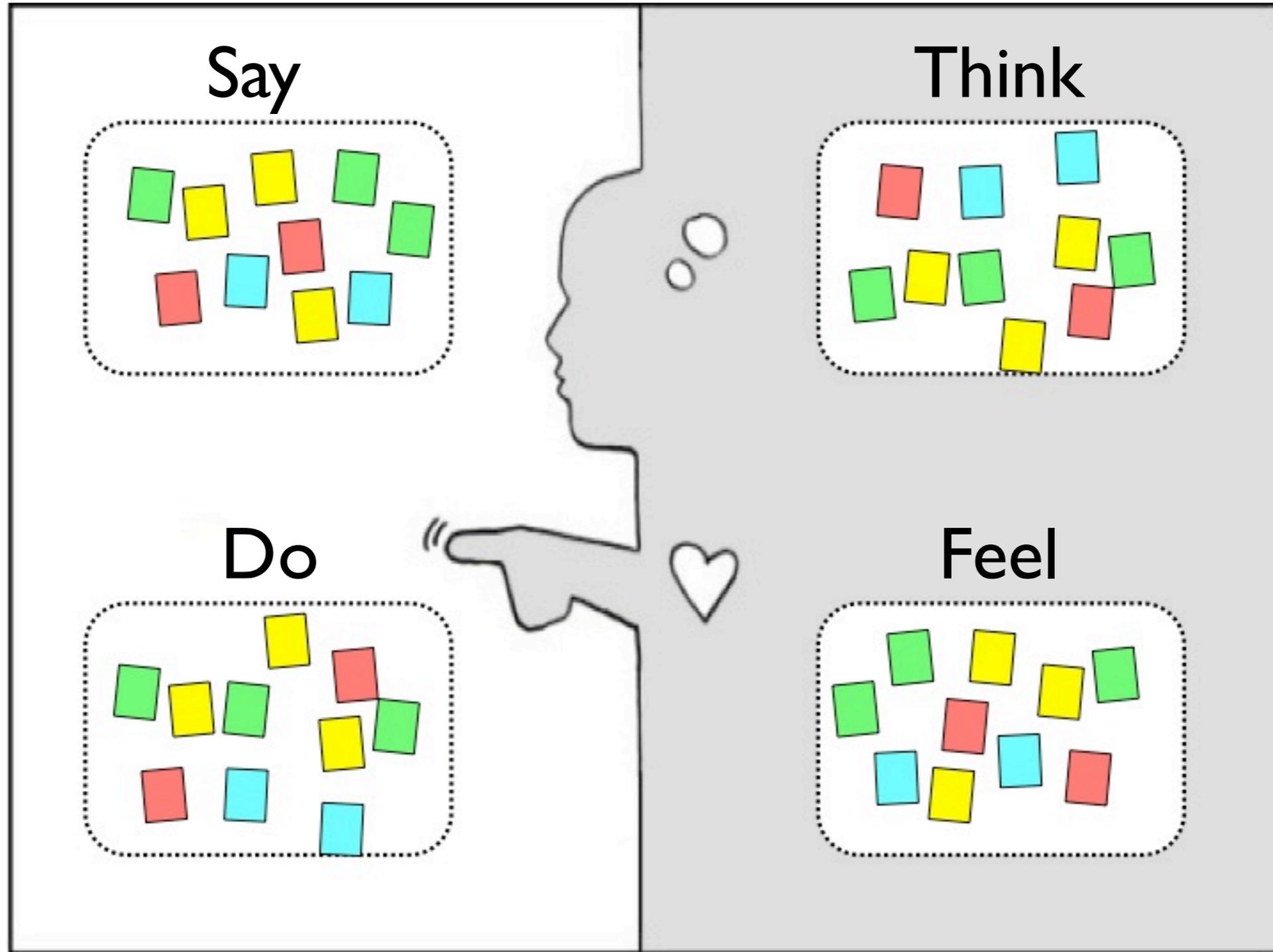


Art by Brandon Teris

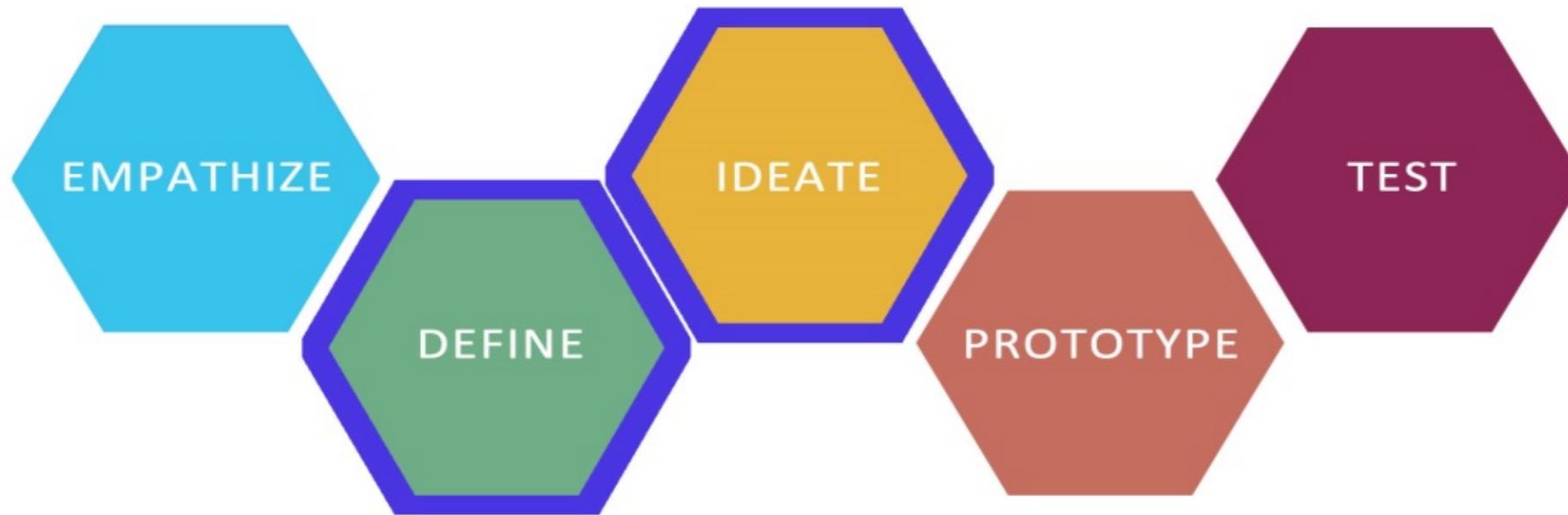
# Taking Interview Notes

Jot notes about what the person being interviewed says and does. Pay attention to what they say the feel.

# Construct an Empathy Map



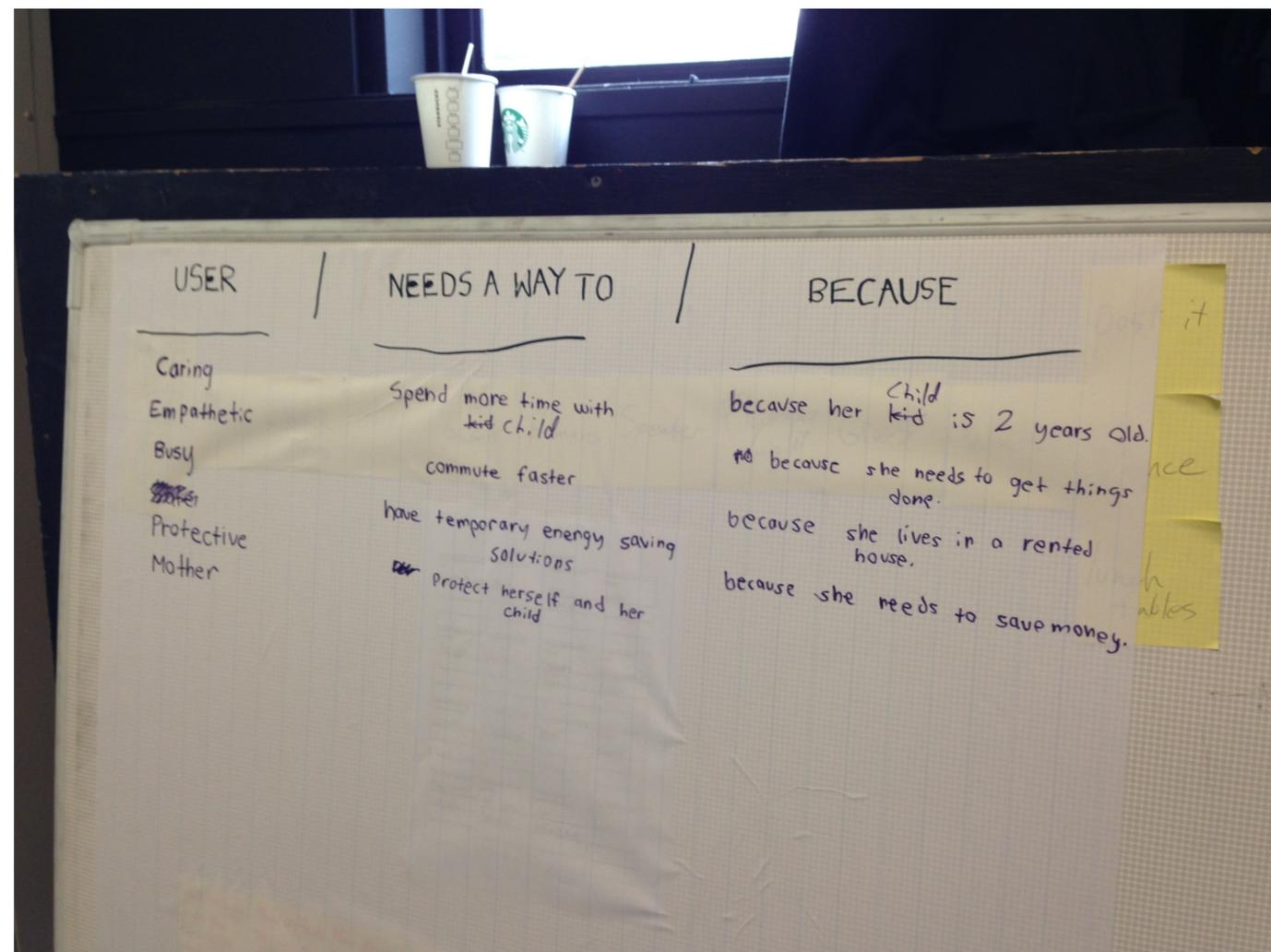
# Part 2: Point of View Statement and Ideation



# Set up a way to create a POV by making a chart.

---

Your User                      Needs a way to                      Because



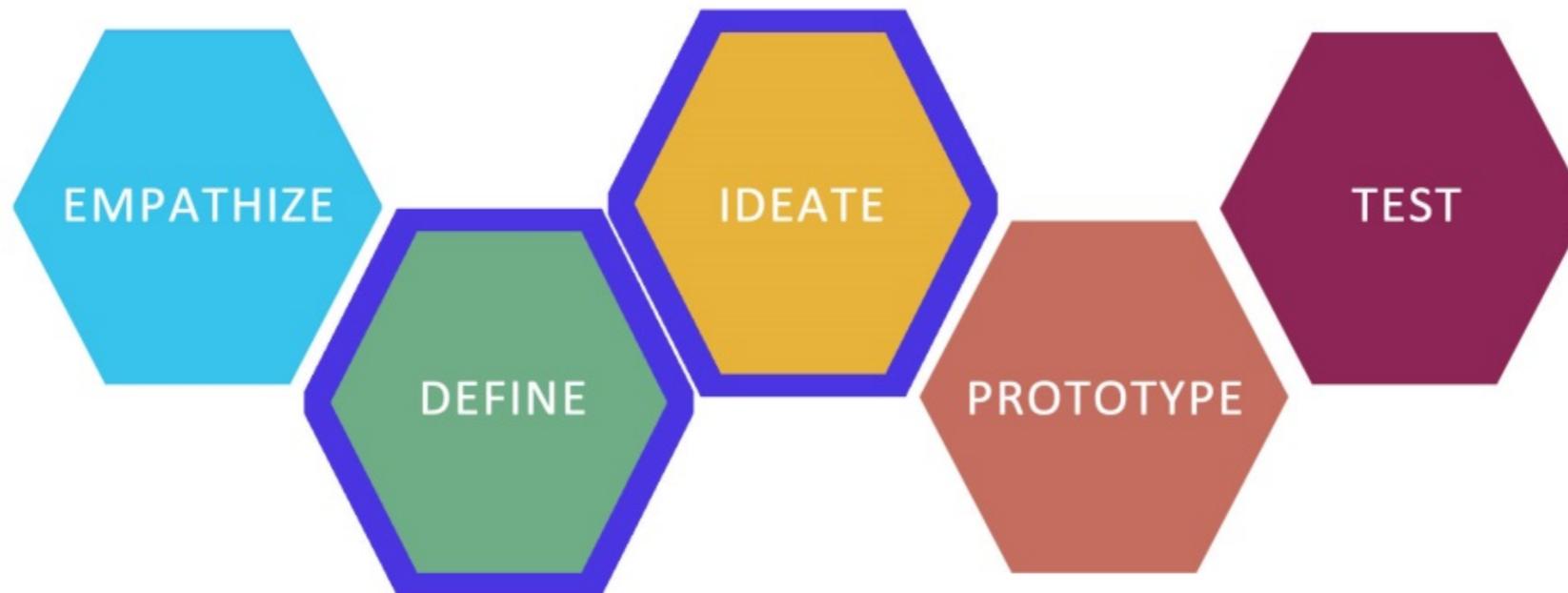
# Point of View Statement

\_\_\_\_\_ needs a way to \_\_\_\_\_  
(User name) (Verb)

because \_\_\_\_\_.  
(Surprising Insight)

# IDEATE

## (Brainstorming)



# BRAINSTORMING RULES & MINDSETS

# Build on the ideas of your team!



Source: [http://www.childrenofbukati.com/photos/photo\\_2010\\_gymnastics\\_pyramid2.jpg](http://www.childrenofbukati.com/photos/photo_2010_gymnastics_pyramid2.jpg)

# Go for wild ideas!



Source: <http://sdzsafaripark.tumblr.com/post/13176848753/cheetah-cub-on-flickr-cheetah-cubs-have-a-long>

Don't judge other's ideas... or your own!



Source: <http://www.pbs.org/newshour/rundown/2011/07/health-care-reform-marches-closer-to-supreme-court.html>

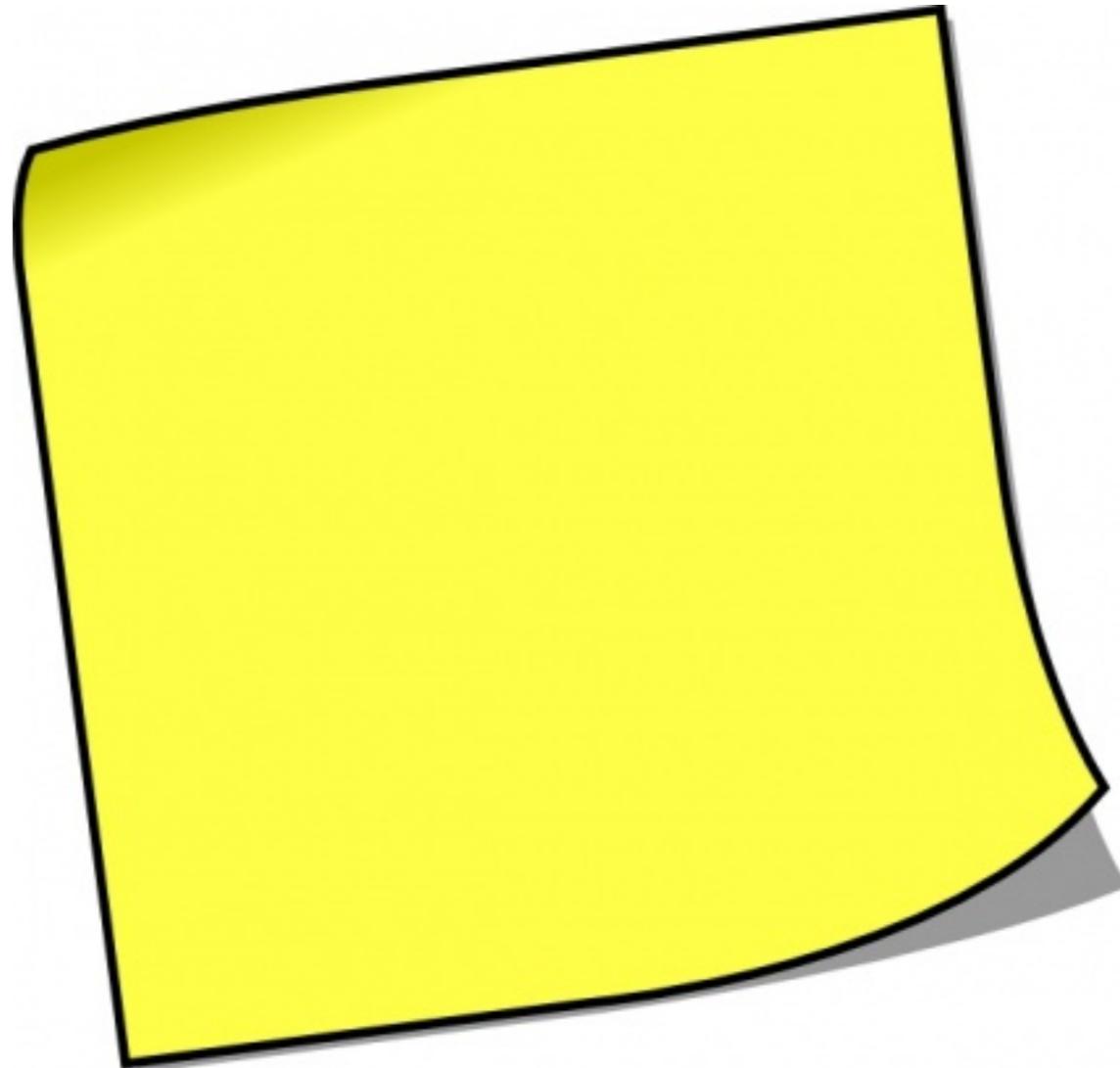
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Capture **EVERY SINGLE IDEA!**



# BRAINSTORMING HOW-TOs

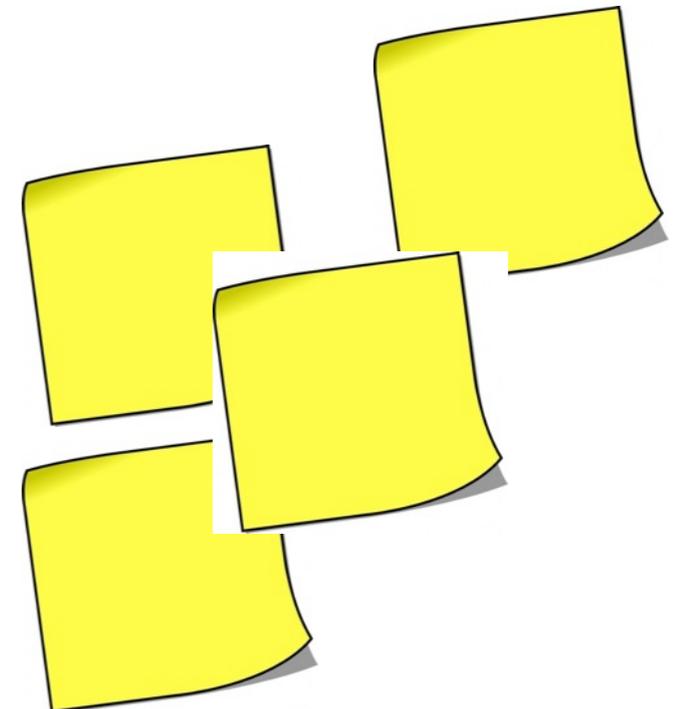
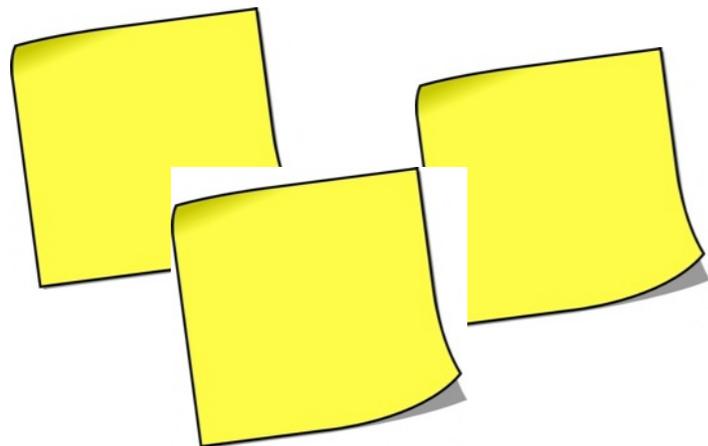
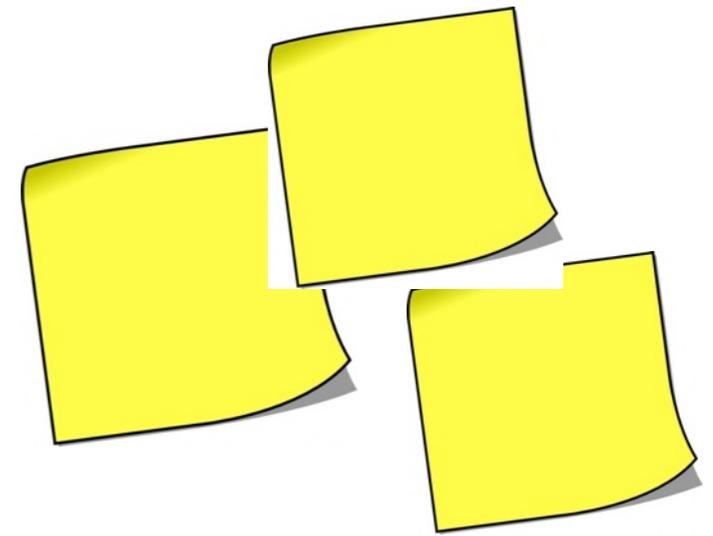
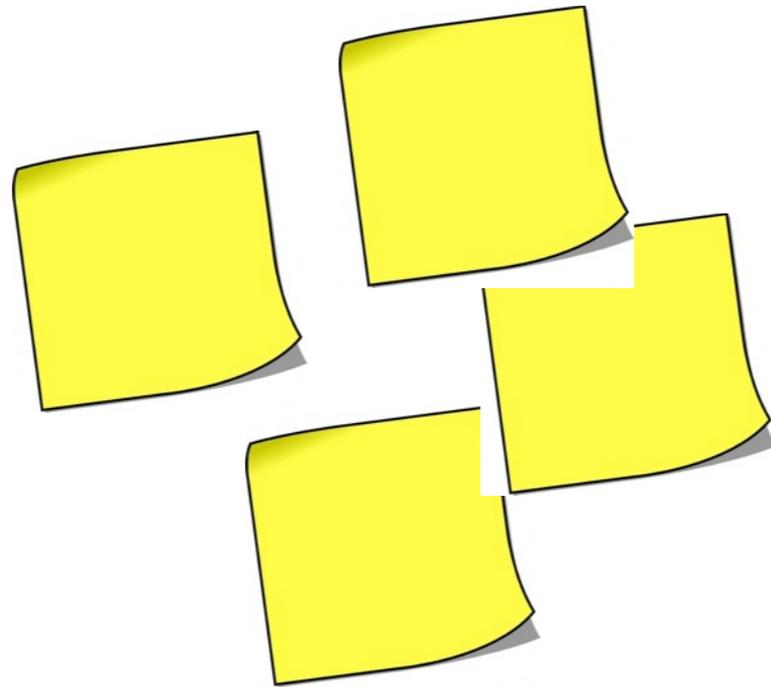
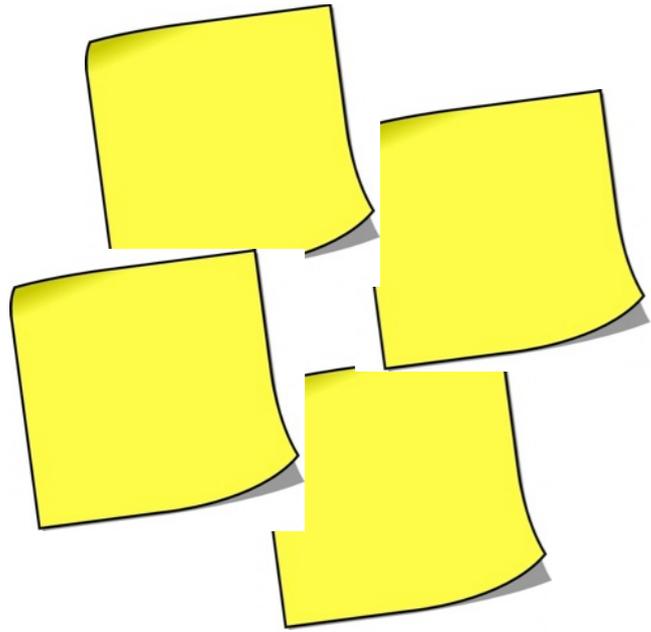
1. Say your ideas.

2. Write them on a post-it note.

3. Stick it up with others

4. Generate many, many ideas

Rearrange your post-it notes into themes.



## Idea Selection

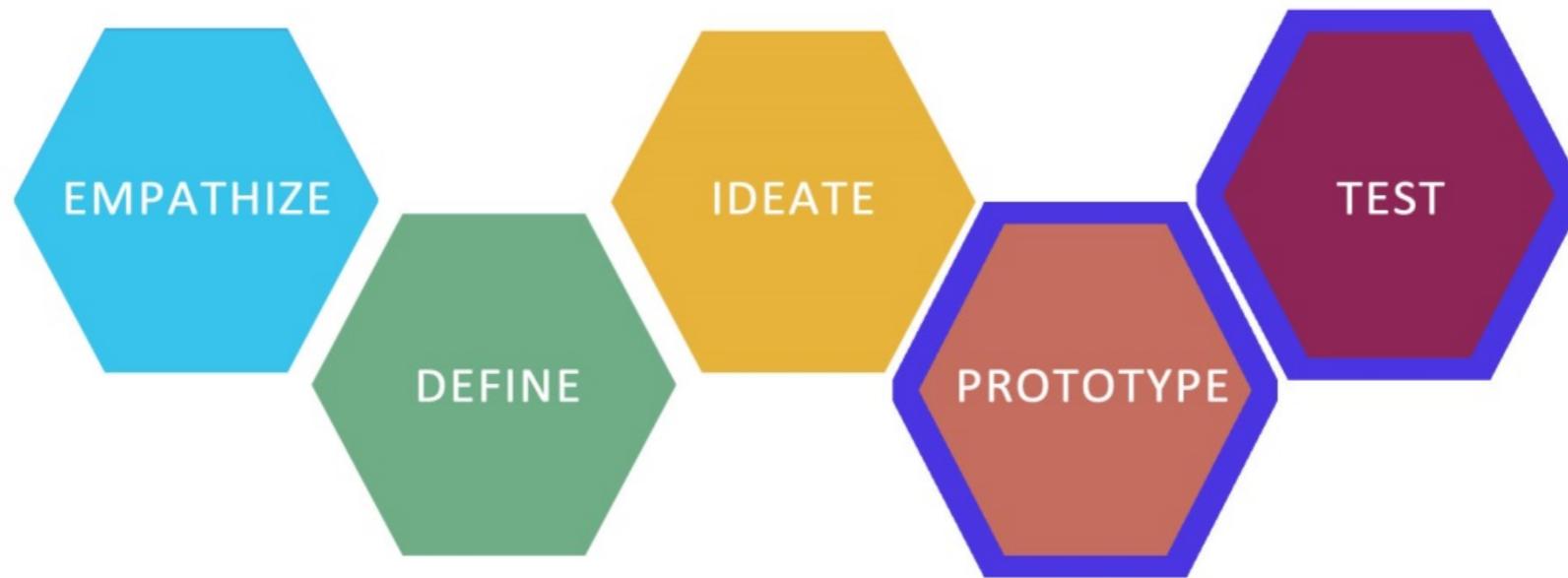
Place a check mark  
next to your 3  
favorite ideas.



As a team, choose your favorite idea to move forward to prototyping.



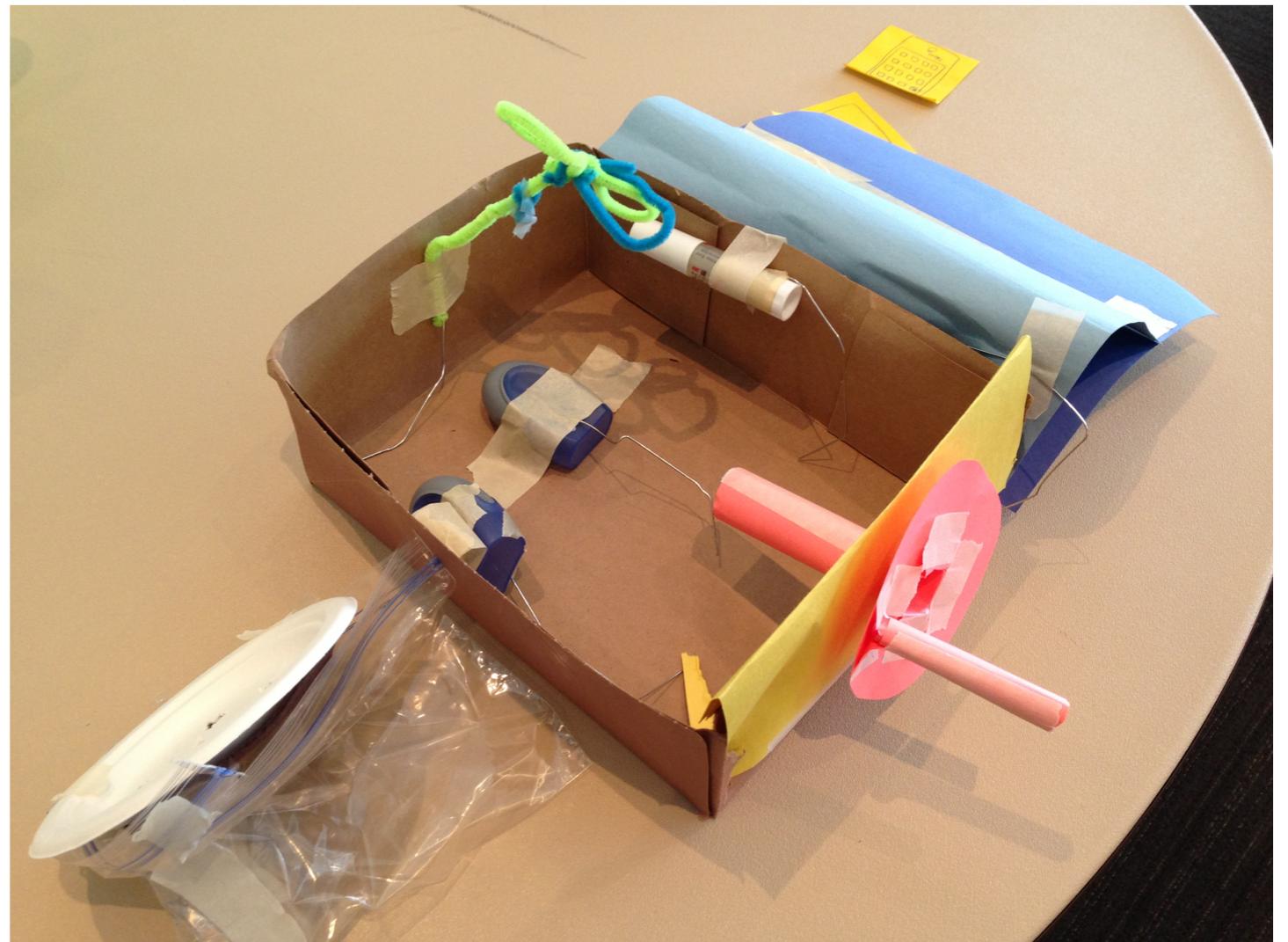
# Prototyping



**BUILD TWO  
PROTOTYPES PER  
TEAM**

# Testing/Feedback

Show your prototype and get feedback so you can make it even more valuable to the user



# Capture User Feedback

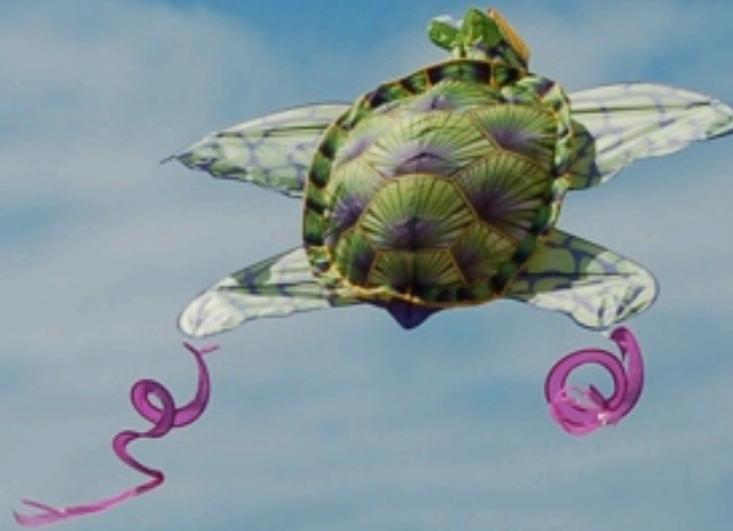
What worked?

What didn't?

What could be improved?

What would you do next?

Now you are design thinkers who will change  
the world...



# The Marshmallow Challenge

Your goal is to build a structure that can extend off a table top with the materials provided.



See next Slide for extra video:

Cain's Arcade. This is for inspiration and can be shown at any time.

One boy's prototyping  
story:

## Caine's Arcade

