

# Fundamental Principles of Innovation and Design Thinking



Cool Fact #1 : Malaysian

Hi, I'm Nicholas Ooi

Programme Manager of  
Lingnan Entrepreneurship Initiative

Faculty Innovation Fellow of  
Stanford d.School

Cool Fact #2 :  
I love Tuen Mun

Ask me about:  
#DesignThinking  
#LegoSeriousPlay



Why do we design?



**EMPATHIZE**

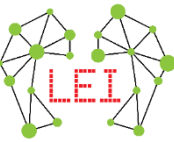
**DEFINE**

**IDEATE**

**PROTOTYPE**

**TEST**





**DT** is a team sport  
Venture together!

DO IT NOW

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REFLECT

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DO IT BETTER



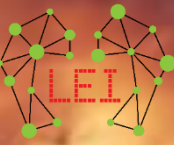
What a Design Challenge looks like?











Infer

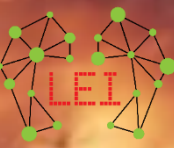
Observation

Insights

“It might be very far for people in rural area of Africa to carry water from the nearest river.”

Our observation: People can walk up to 3 hours to fetch water and the weight can cause muscle strain.





Infer

Observation

Insights

“It might be very far for people in rural area of Africa to carry water from the nearest river.”

Our observation: People can walk up to 3 hours to fetch water and the weight can cause muscle strain.

Carrying weight over long distance may strain the muscle and causes fatigue which may negatively affect their pregnancy

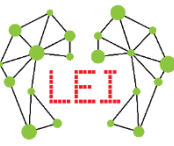






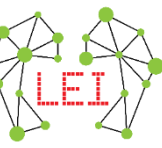
How do we apply Design Thinking?



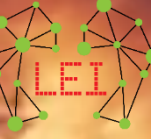


PERU









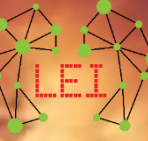
Infer

Observation

Insights

“Peru have experienced severe floods every year”

Our observation: Electricity will be cut off during flood season



Infer

Observation

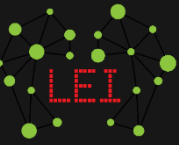
Insights

“Peru have experienced severe floods every year”

Our observation: Electricity will be cut off during flood season

This may affect the healthcare facilities in the flooding area





## SOLUTION:

We Care Solar Suitcase is invented as a healthcare facility that have adequate lighting and power to save lives.



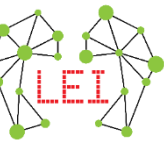
How we do that in Hong Kong?



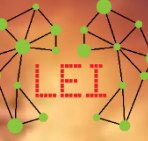


# Sub-divided households









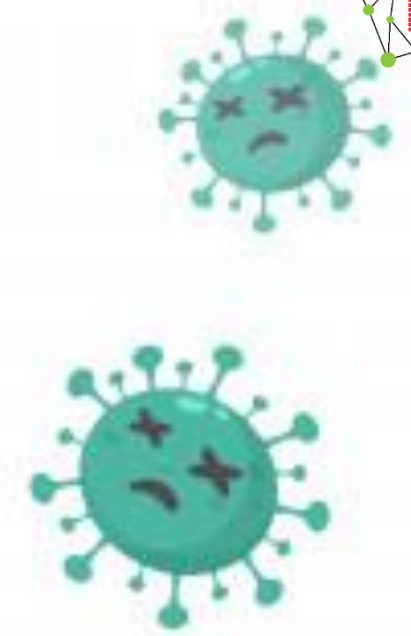
Infer

Observation

Insights

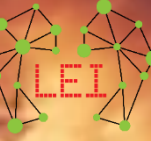
“Hong Kong has more than 100,000 people living in sub-divided unit”

Our observation: The spread of Coronavirus could be deadly



**COVID-19**  
DISINFECTION





Infer

Observation

Insights

“Peru have experienced severe floods every year”

Our observation: Electricity will be cut off during flood season

It may be difficult to disinfect viruses in such a complex space



**SOLUTION:**  
Project Ultra Violette  
- Helps 1,000 households to disinfect their sub-divided units.







# Empathy

If I would change one thing to improve after the pandemic, what would that be and why?





**1** NO POVERTY

A white icon of a family consisting of two adults and two children, standing together.

**2** ZERO HUNGER

A white icon of a bowl with three wavy lines above it, representing steam or food.

**3** GOOD HEALTH AND WELL-BEING

A white icon of a heartbeat line with a heart symbol at the end.

**4** QUALITY EDUCATION

A white icon of an open book and a pencil.

**5** GENDER EQUALITY

A white icon of a female symbol with an equals sign inside.

**6** CLEAN WATER AND SANITATION

A white icon of a water tap with a single drop of water falling from it.

**7** AFFORDABLE AND CLEAN ENERGY

A white icon of a sun with a power button symbol in the center.

**8** DECENT WORK AND ECONOMIC GROWTH

A white icon of a bar chart with an upward-pointing arrow.

**9** INDUSTRY, INNOVATION AND INFRASTRUCTURE

A white icon of three stacked cubes.

**10** REDUCED INEQUALITIES

A white icon of an equals sign inside a circle.

**11** SUSTAINABLE CITIES AND COMMUNITIES

A white icon of several city buildings of different heights.

**12** RESPONSIBLE CONSUMPTION AND PRODUCTION

A white icon of an infinity symbol.

**13** CLIMATE ACTION

A white icon of an eye with the Earth as the pupil.

**14** LIFE BELOW WATER

A white icon of waves and a fish.

**15** LIFE ON LAND

A white icon of a tree and two birds flying.

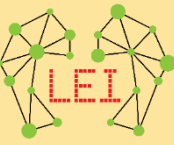
**16** PEACE, JUSTICE AND STRONG INSTITUTIONS

A white icon of a dove holding an olive branch and a gavel.

**17** PARTNERSHIPS FOR THE GOALS

A white icon of four interlocking circles.





## Define

How would you make an assumption of what they need?







**CORONAVIRUS: FACE MASKS  
A GROWING POLLUTION PROBLEM**



# 八月旺季如淡季

旅遊業點樣重新出發？



**疫情期間遊人增加  
山野垃圾隨之增加**





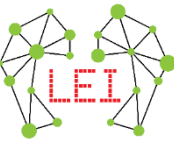
# 長者疫下無街出無社交 近6成人情緒變負面



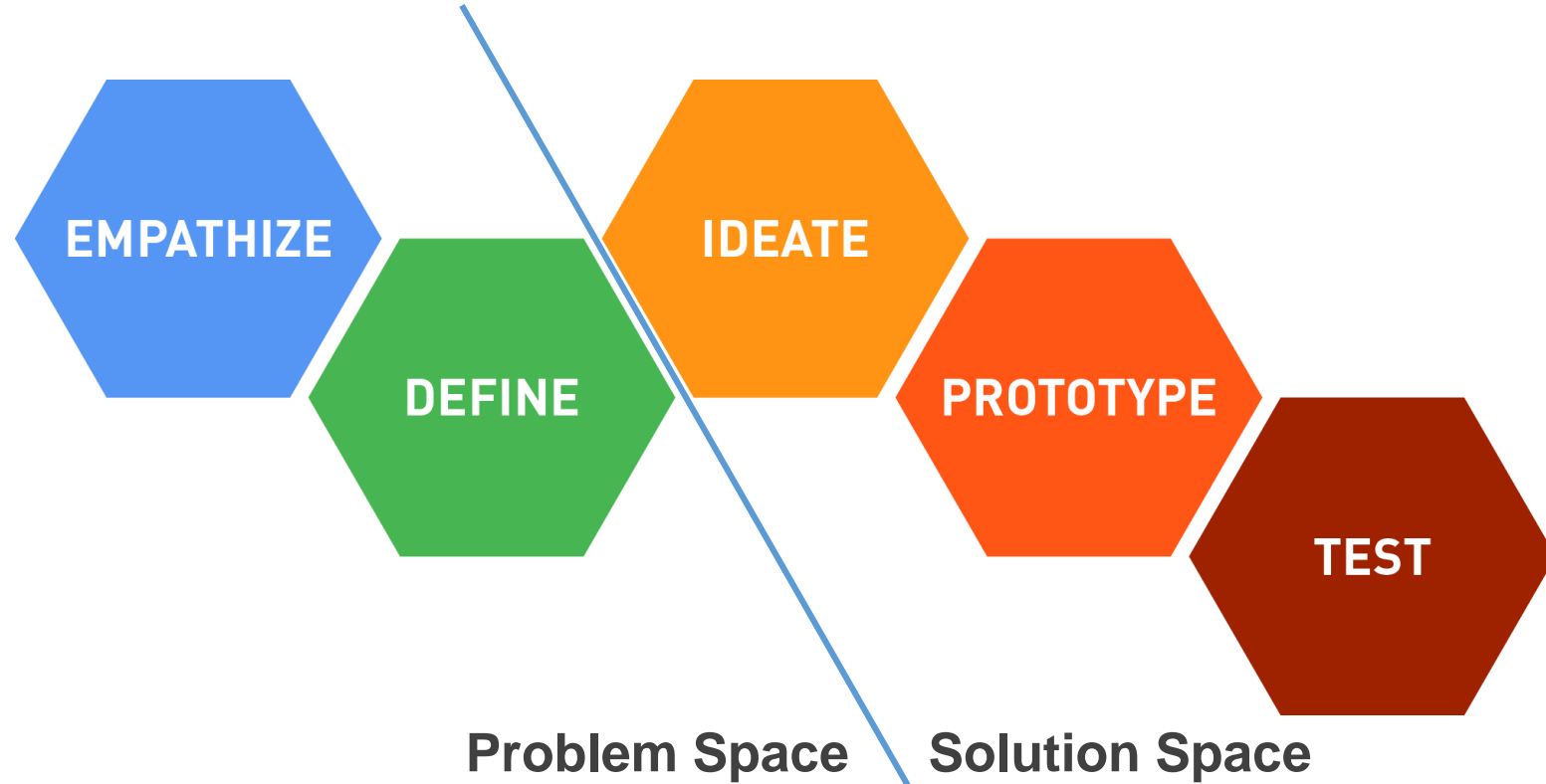
# 長時間網上授課 疫情期間家長憂兒童視力會因而受損



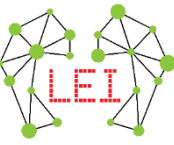
# HK NEEDY STUDENTS SIDELINED BY ONLINE LEARNING



# From PROBLEM SPACE to SOLUTION SPACE



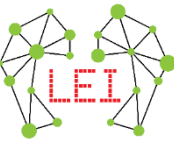




# Problem Statement



**HOW  
MIGHT WE ... ?**



## HOW MIGHT WE

Promote concept of Active Ageing  
to elders at Kowloon Districts?

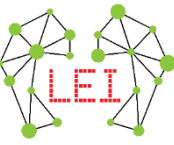
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## HOW MIGHT WE

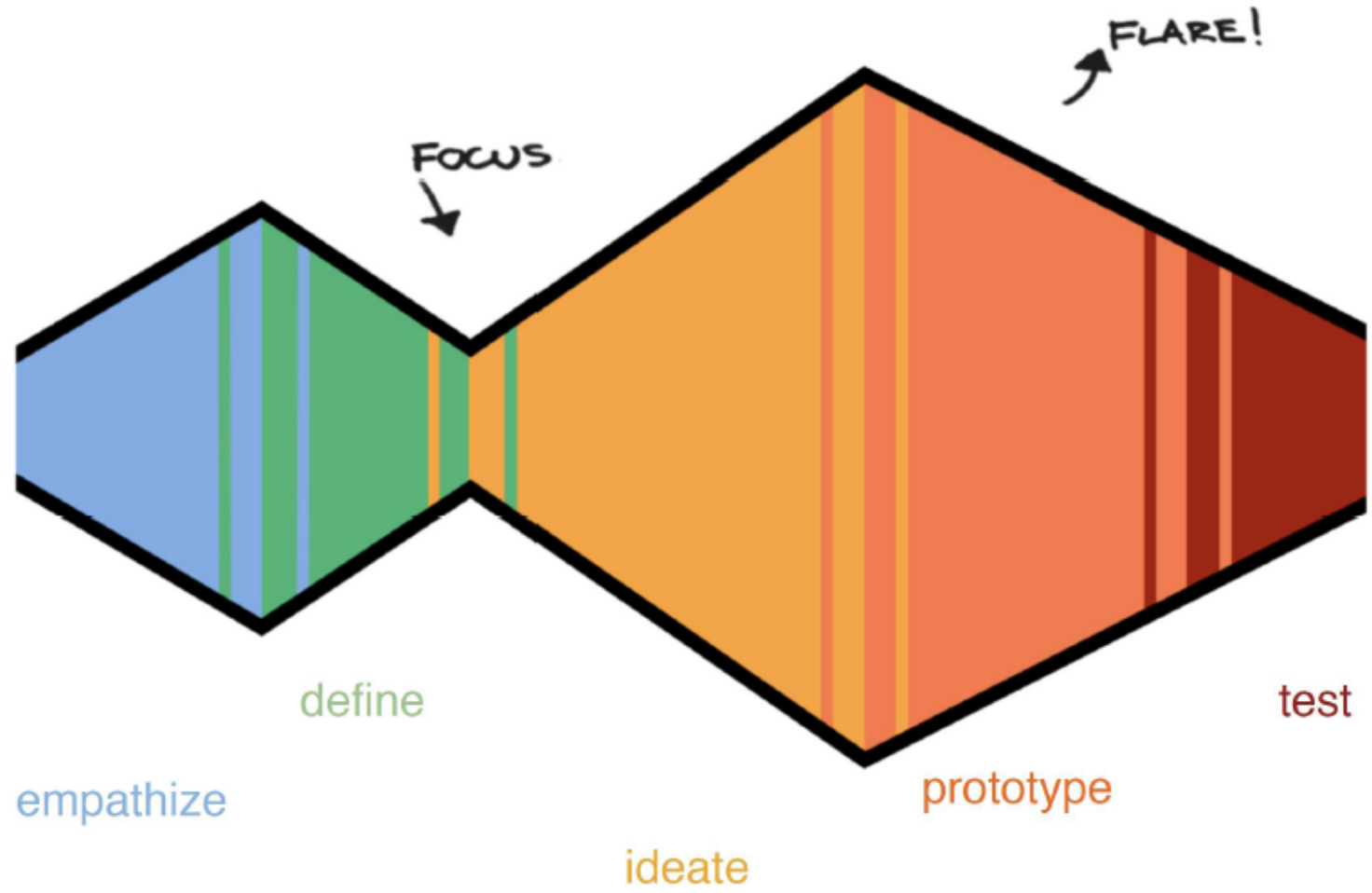
Create an age-friendly environment  
at Tuen Mun District?

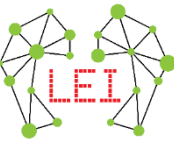
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# Ideation





Yes~

BUT





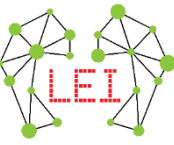


What should a good brainstorming look like?



**YES  
AND**





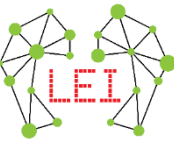
Creative, bad,  
undeveloped  
and crazy ideas



Evaluate **Feasibility**



FAMILIAR AND  
INCREMENTAL  
RESULTS



Creative, bad,  
undeveloped  
and crazy ideas



Evaluate for  
**Potential**

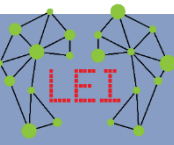


Can be  
developed  
for feasibility

"Can explore  
further"?  
Or  
"Can move to  
feasibility study"?

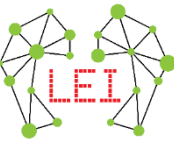


# I HAVE AN IDEA WITH POTENTIAL... NOW WHAT?



**Transparent  
Mask for the  
people who  
use sign  
language**



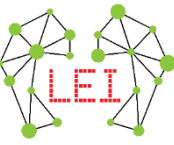


# Transparent Mask

- Safe
- Protection
- Able to read lips
- No fog
- Transparent







# Transparent Mask

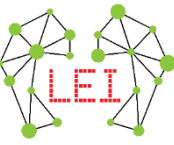
- Safe
- Protection
- Able to read lips
- No fog
- Transparent

*What are other ways we can provide these attributes?*

# Plastic Mask + Coffee Filter



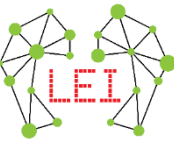




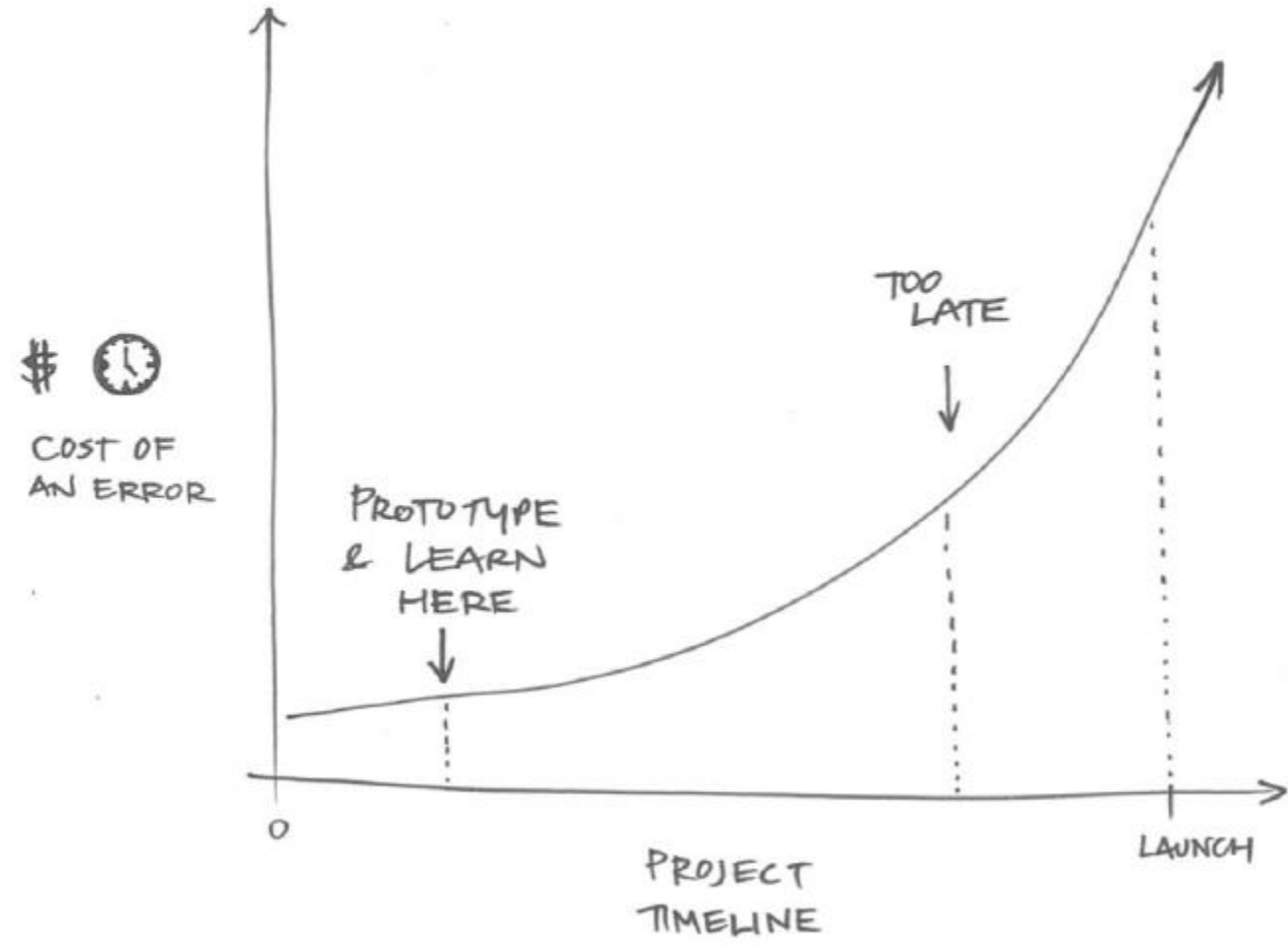
# Don't be shy!

*Don't shy away from radical ideas- use them as inspiration for a solution! (that's where innovation is usually found!)*





# WHY WE PROTOTYPE AND TEST







# Prototype to figure out the details

Algemeten batton

BOVEN

1,2 cm

1,2 cm

4 mm

3 mm / 4 mm

Plaatje framework binnen

2 mm

2 mm

4 mm

3,3

5,4 cm

binnenkant cub

1,2

1,2

2,1

3,3

5,4

5,4 cm

lange plaat

1,5 cm

3 cm

5,4 cm

Dikte plaat

3 mm

Dikte fake breadboard

2 mm

0,5

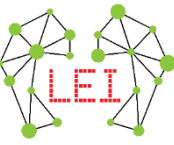
5,4 - 1,2 = 4,2 / 2 = 2,1

late plaat

1,5

4,3





**CREATE AN  
IMAGINARY  
WORLD  
ANOTHER  
PERSON  
CAN STEP  
INTO**

# Use improvise to figure out the details





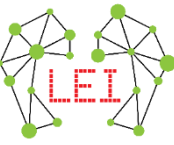
CLOSED for ALTERATIONS ~ OPENING SOON ~  
*THE FIRST ONE IN AMERICA !!!!*

# DRIVE-IN HAMBURGER BAR

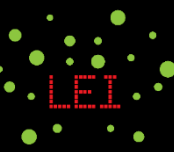
CREATED and OPERATED by MCDONALD BROS



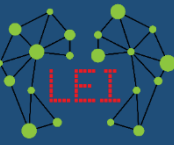
# LEGO Prototype





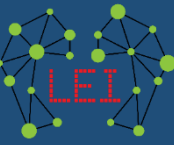


# Prototype to Test Assumptions

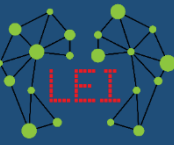


**TESTING = EMPATHY**

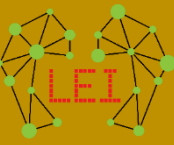




Do Not Sell, Explain or Convince  
But...



# Test Your Assumption With other 3 groups



# Re-evaluate Your Idea



**Love**

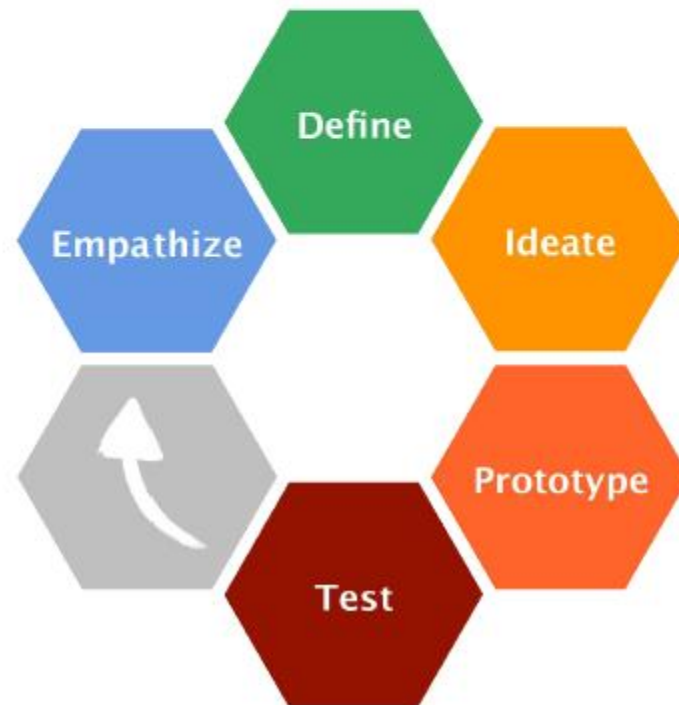
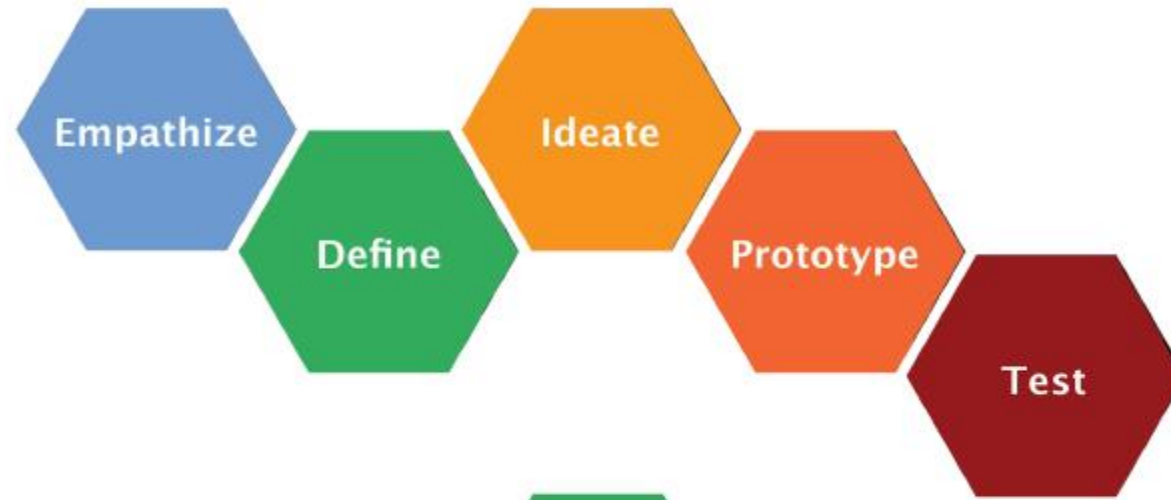
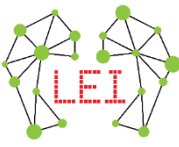


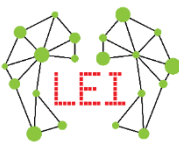
**Like**



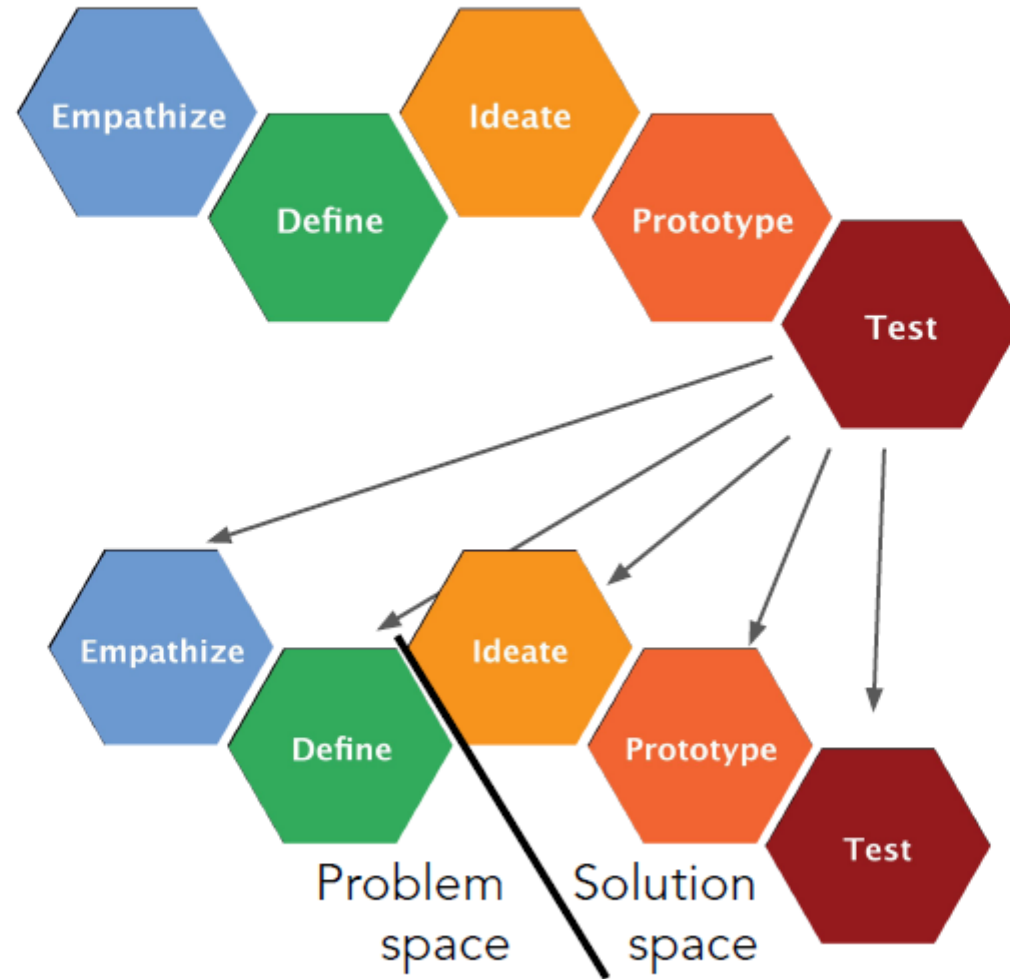
**Dislike**

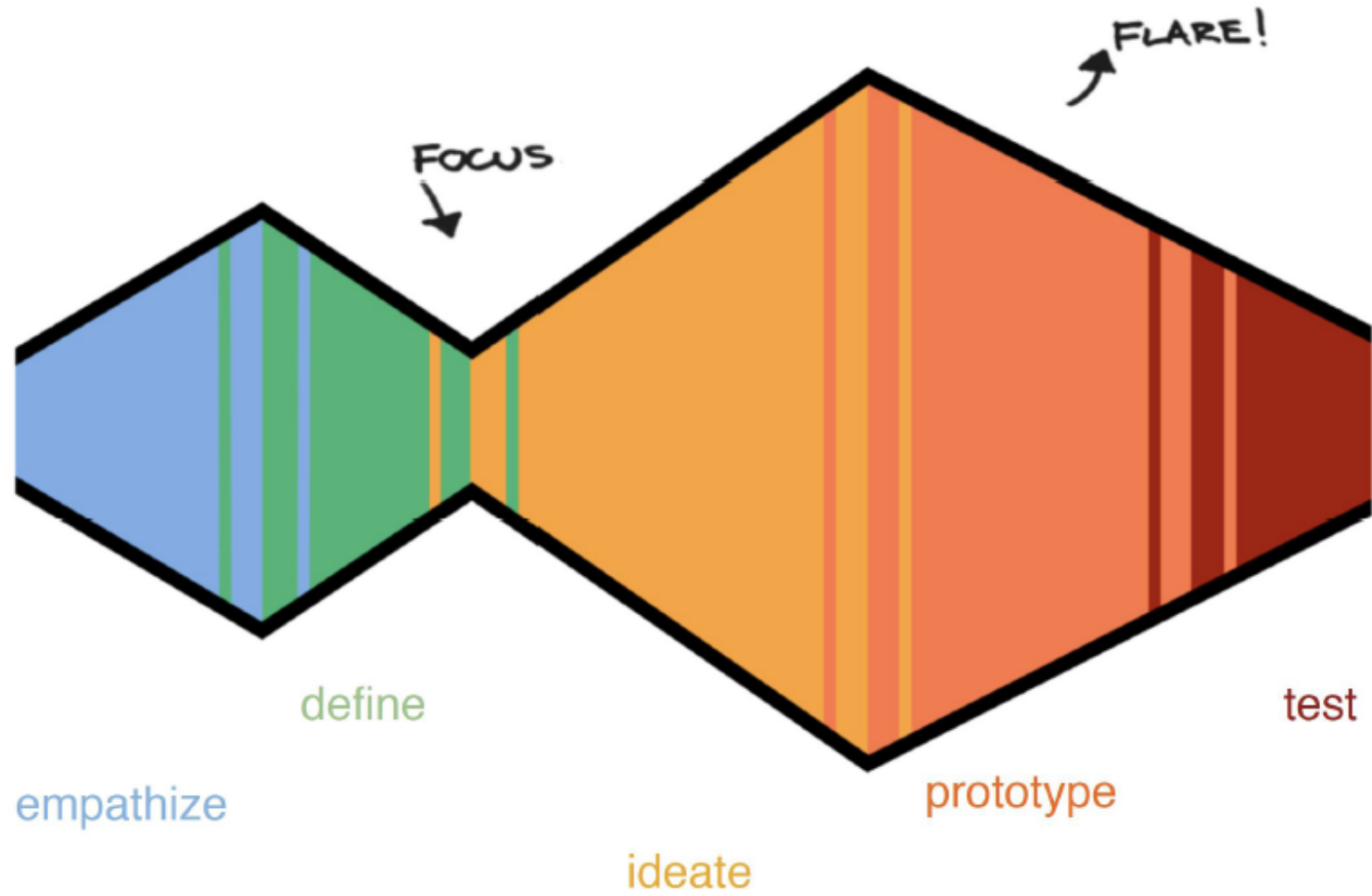
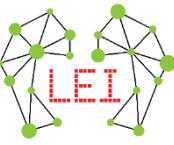




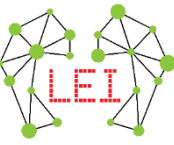


# Testing helps you decide what to do next.









— THE DESIGN THINKING PROCESS —

DO IT NOW

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REFLECT

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DO IT BETTER

Everything is Design.  
EVERYTHING!  
(Paul Rand)