Flashlight Powered by Body Heat
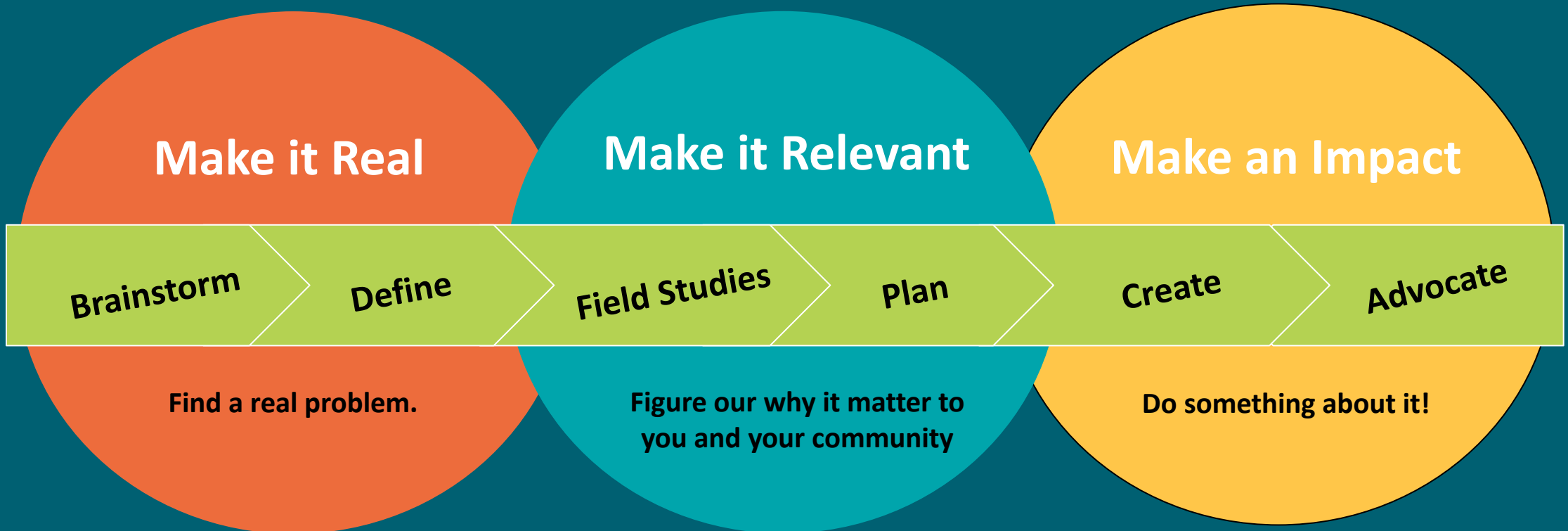
- 15 year old Ann Makosinski, a high school junior in Victoria, British Columbia.

- Ann Application to World Google Science Fair
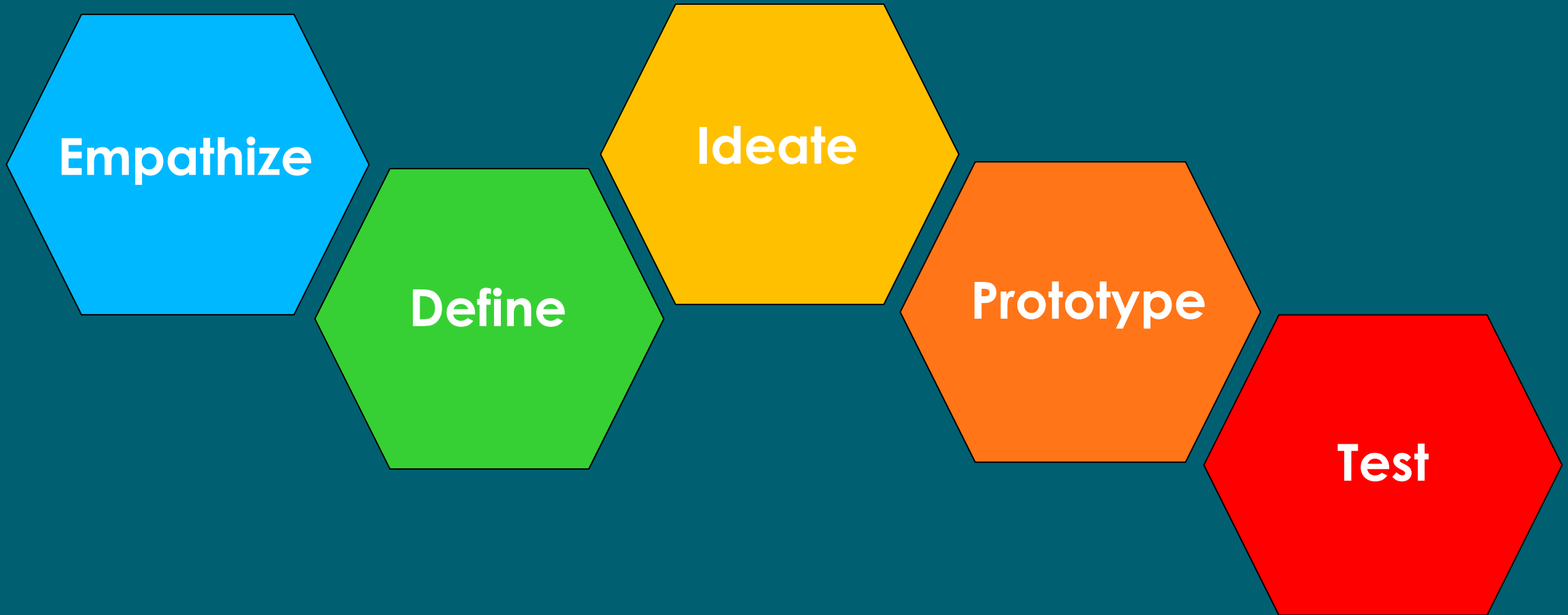
- Ann Makosinski Ted Talk (9:30 – 11:50)

http://www.dailymail.co.uk/news/article-2351791/Ann-Makosinski-Canadian-girl-invents-flashlight-powered-body-heat-earns-spot-Google-Science-Fair-finals.html
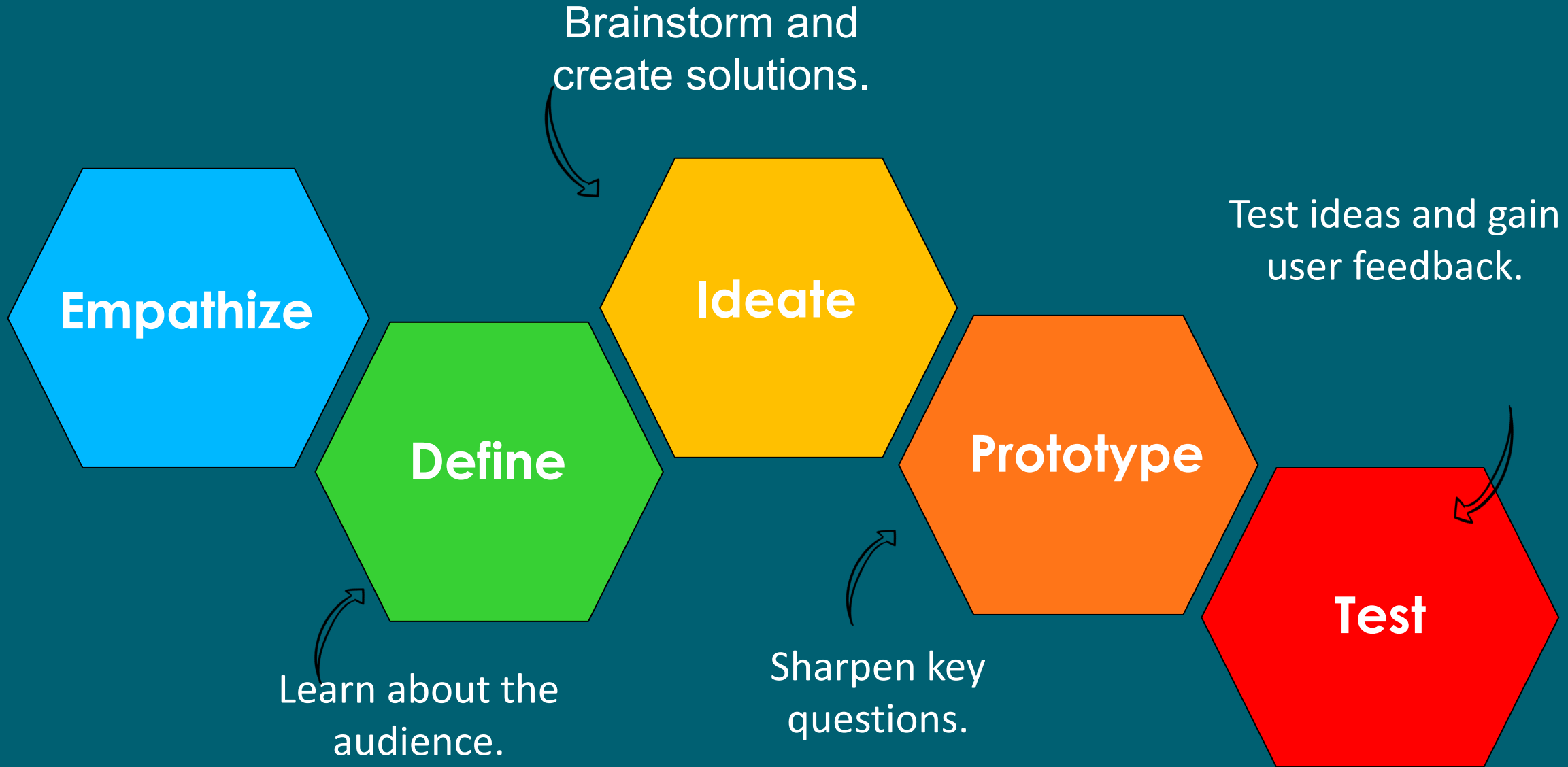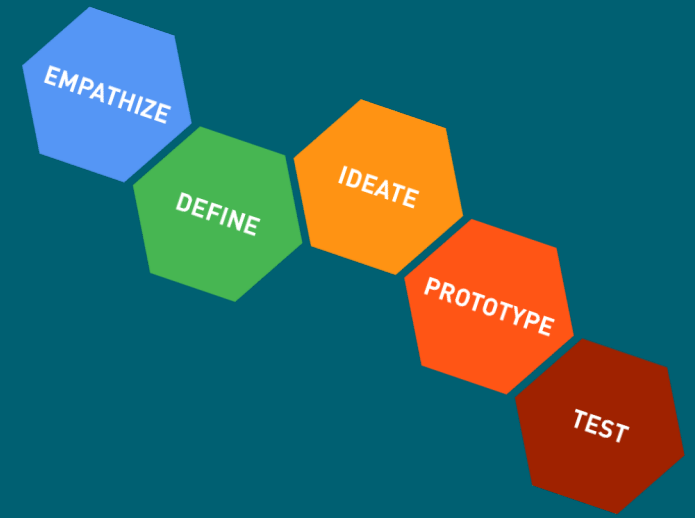

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Design Thinking

Make it Real

Make it Relevant

Make an Impact

Brainstorm → Define → Field Studies → Plan → Create → Advocate

Find a real problem.

Figure our why it matter to you and your community

Do something about it!

Image: https://sadcdessources.com/category/innovation/

Design Thinking Process

Empathize

Define

Ideate

Prototype

Test

Brainstorm and create solutions.

Test ideas and gain user feedback.

Empathize

Define

Ideate

Prototype

Test

Learn about the audience.

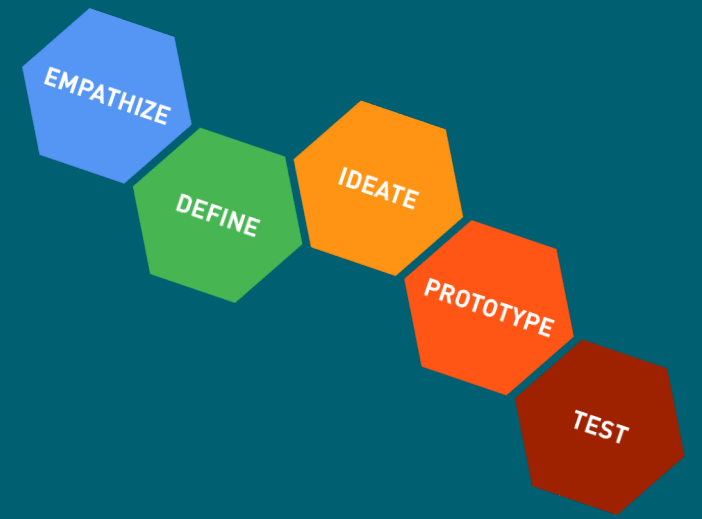Sharpen key questions.

Design Thinking

*** *Teacher Notes*

- ▶ Very powerful process
- ▶ Once learned can be completed in a half day
- ▶ First few times through you'll want to ensure some skills are in place with your students
  - ▶ Empathizing
  - ▶ Note Taking
  - ▶ Interview skills, probing questions
  - ▶ Peer Critiquing
  - ▶ Ideating

EMPATHIZE

DEFINE

IDEATE

PROTOTYPE

TEST

Design Thinking

*** *Teacher Notes*

▶ Today we'll move quickly through a design challenge.

▶ We have added some teacher notes to the slide show — some things to consider during or before taking your student through a challenge.

▶ Note Design Thinking frameworks all have in common core, but not all have to follow this framework. We are following one developed by Susan Crichton.

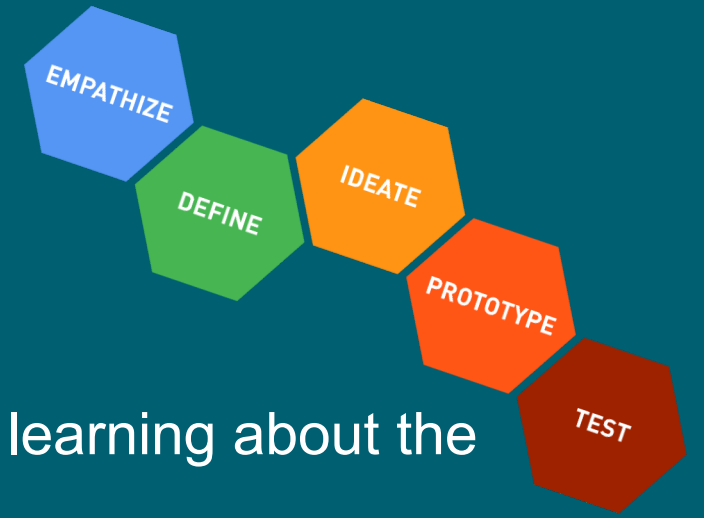▶ Feel free to take this framework and make it your own.

Design Thinking

***Teacher Notes
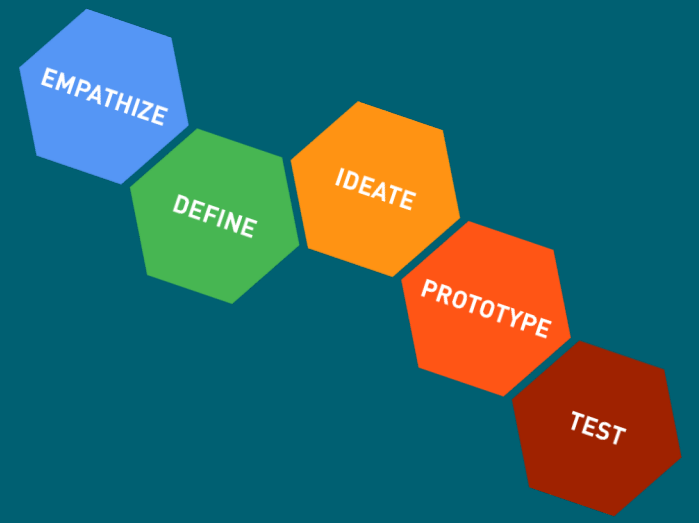
▶ Groups of 4 are best. As you run through a few challenges you may want to adjust this.

▶ Start with partners for steps 1 to 5

▶ Could do A/B partners or do A/B and C/D then switch to A/C & B/D
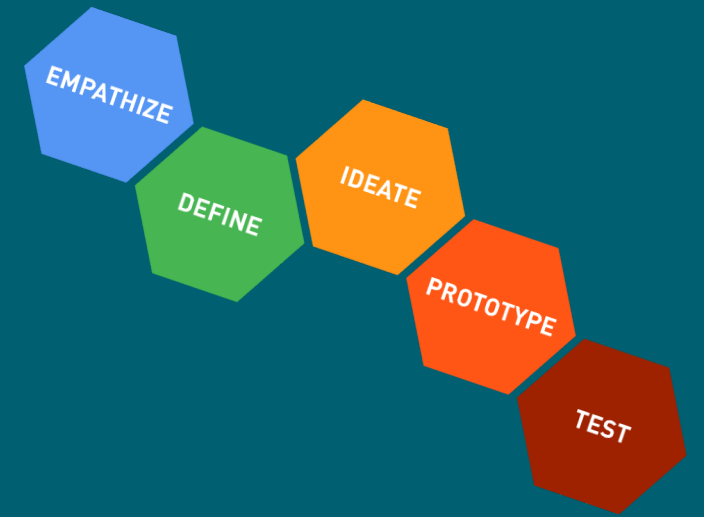
1. Interview Notes

*****Teacher Notes*

▶ Before doing the Empathy stage you want to do some learning about the topic.

  ▶ Ie: Refugee challenge … learn about what a refugee is, what make them a refugee, what are the challenges they will encounter when trying to leave their country.

▶ Design thinking could be a good culmination to a unit.

▶ Note that this process with beginners could take days or even weeks.
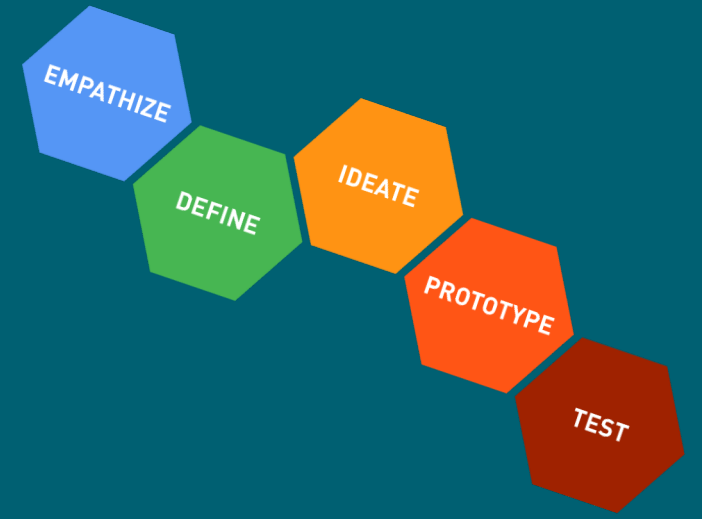
1. Interview Notes
(Empathy) – 2 x 4 mins

- ▶ 1 person Speak to the problem for 4 minutes
- ▶ You listen and take notes in box 1
- ▶ Speaker talks to:
  - ▶ What is your problem?
  - ▶ How do you know?
  - ▶ Who is impacted / target group?
  - ▶ Who do you have to consider?
  - ▶ Why should you solve the problem?

# 2. Detailed Interviews
*** *Teacher Notes*

- ▶ This step can be very tough for students.

- ▶ May want to do some modeling for the class.

EMPATHIZE
DEFINE
IDEATE
PROTOTYPE
TEST

2. Detailed Interviews
(Empathy) 2x3 mins

▶ Opportunity to delve deeper and question

▶ Ask probing questions to gain more information from first set of notes.

  ▶ Tell me more about…

  ▶ Tell a story …

  ▶ Tell me about a time when …

EMPATHIZE

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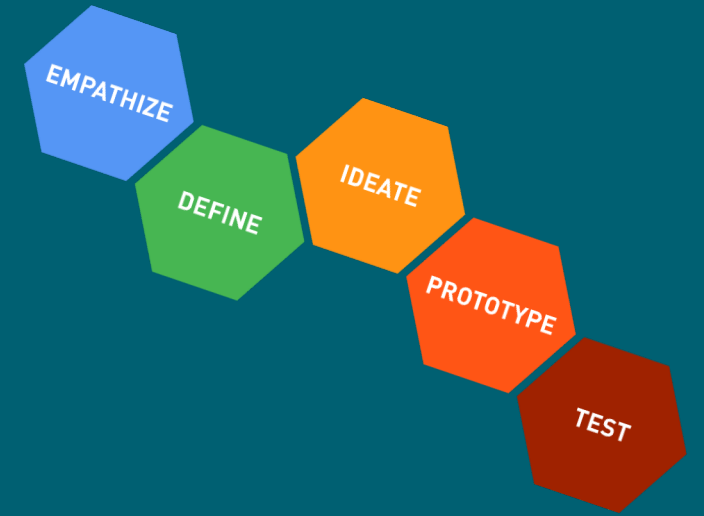
3. Defining the Issue
*** *Teacher notes*

▶ Box #3 - Define

▶ Time to define the issue in the students' words

▶ Completed silently

▶ Younger grades may need to either sketch a picture of the issue or buddy with an older class?
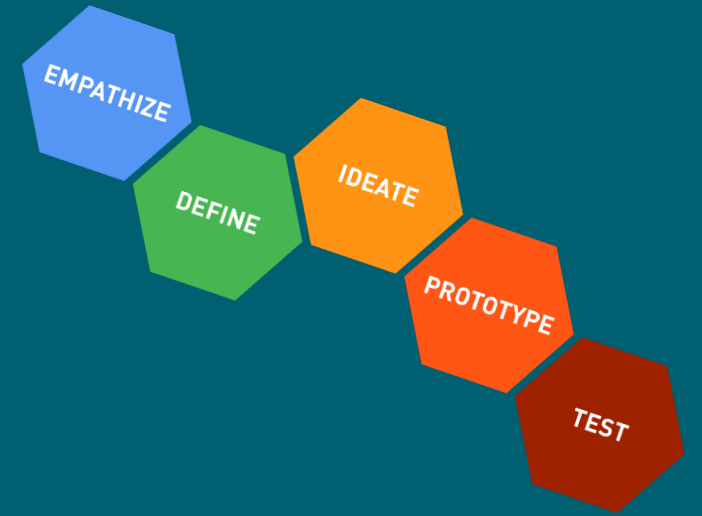
3. Defining the Issue
(3 mins)

▶ Box #3 - Define - 3 mins on your own

▶ Take note and define the issue.

▶ What are your Goals and Wishes

▶ Insights

   ▶ Objectives of your bigger goal(s).

      ▶ Ie. I want a covered area big enough for 20 people to gather with space for cooking should someone bring a bbq
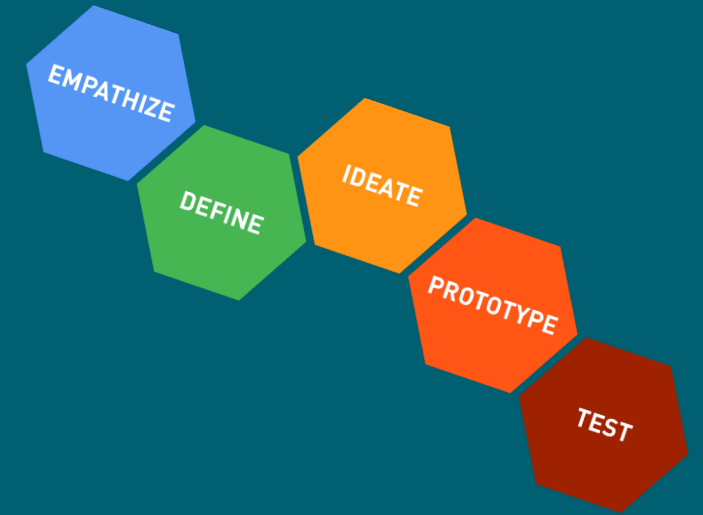
4. Ideate – 5 ideas
– *Teacher notes*

- ▶ Remind students … no limits.

- ▶ Could take 10 mins or stretch this out over days or weeks

- ▶ Students need to work through this part quietly

- ▶ One idea should be a crazy and wild idea

  - ▶ No time constraints, money and resources are unlimited.

  - ▶ Help them get their creative juices flowing

EMPATHIZE

DEFINE

IDEATE

PROTOTYPE
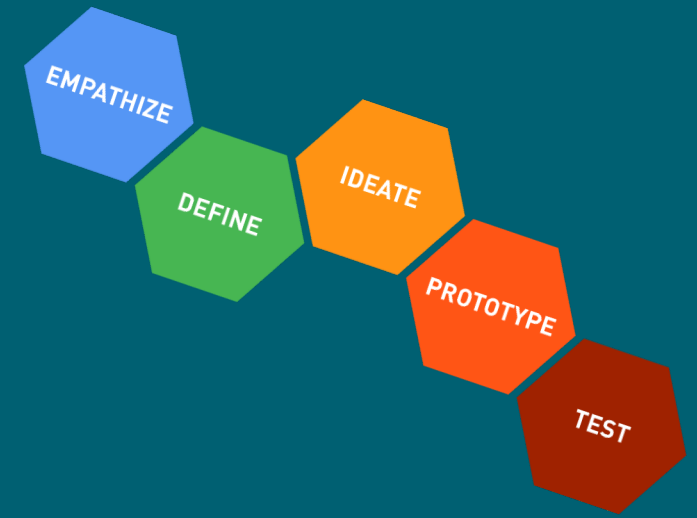
TEST

4. Concevoir des idées
(10 Mins)

- ▶ REMEMBER … As you are ideating, no limits.

- ▶ 10 mins timed on your own quietly

- ▶ Sketch out 5 ideas
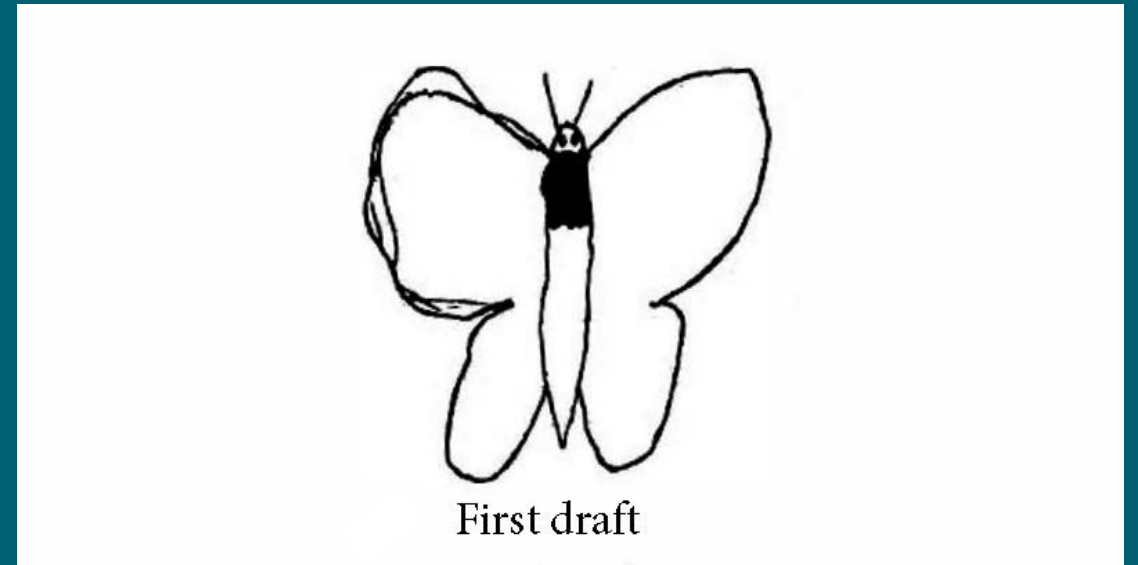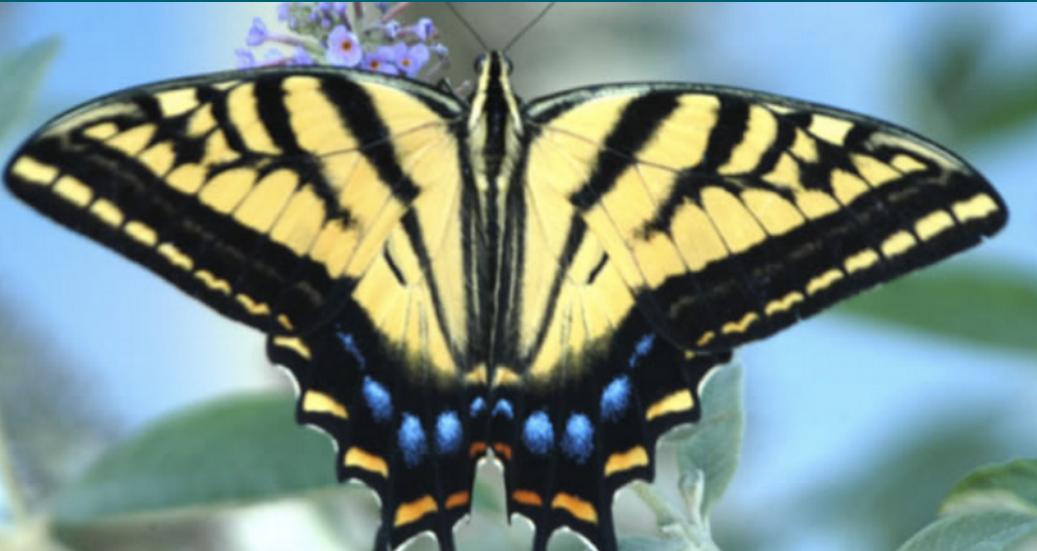
- ▶ One idea needs to be a crazy and wild idea

EMPATHIZE

DEFINE

IDEATE

PROTOTYPE
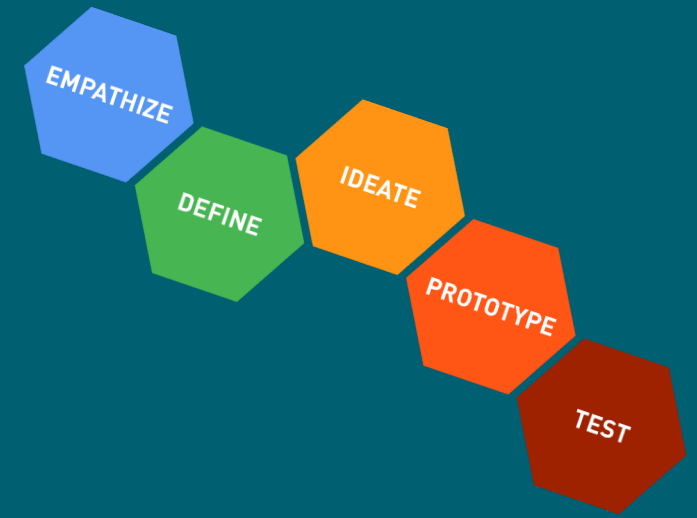
TEST

5. Feedback
*** *Teacher Notes*

- This is the peer critique part

- "I like, I like, I wonder"

- Could do a lesson on peer critiques first

  - Austin's Butterfly

- You'll also find that during this process (hearing about your partner's ideas) you will further develop your own ideas

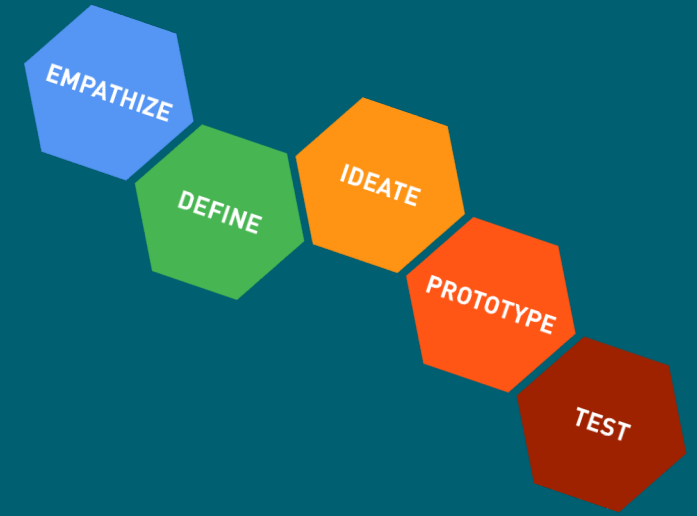- Encourage borrowing of ideas and refining your ideas with elements of your partners

EMPATHIZE

DEFINE

IDEATE

PROTOTYPE

TEST
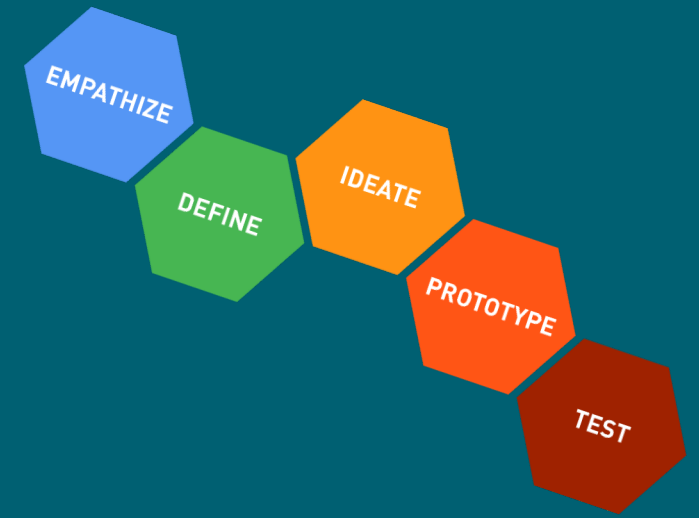
Austin's Butterfly

Resource to help with peer Critique

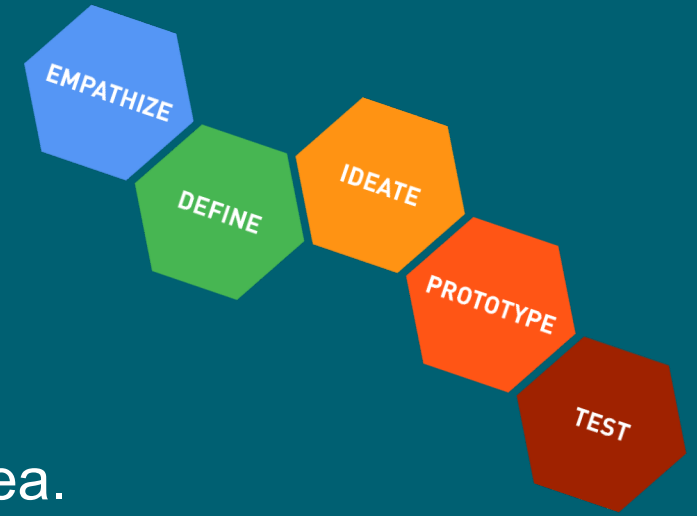First draft

https://www.youtube.com/watch?v=dOSiU42P8Gc

5. Feedback
(2x5 Mins)

▶ I like, I like, I wonder

 ▶ Identify some things you like about your partners ideas

 ▶ Ask any clarifying questions

 ▶ Opportunity to make suggestions (make the wings less pointy – Austin's Butterfly)

▶ Peer critique

▶ Take notes as your partner gives you feedback

EMPATHIZE

DEFINE

IDEATE

PROTOTYPE

TEST

6. Redesign

▶ Students will need to narrow their idea down to one idea.

▶ Add, remove, change anything you like to create one idea they will soon be sharing with their group.
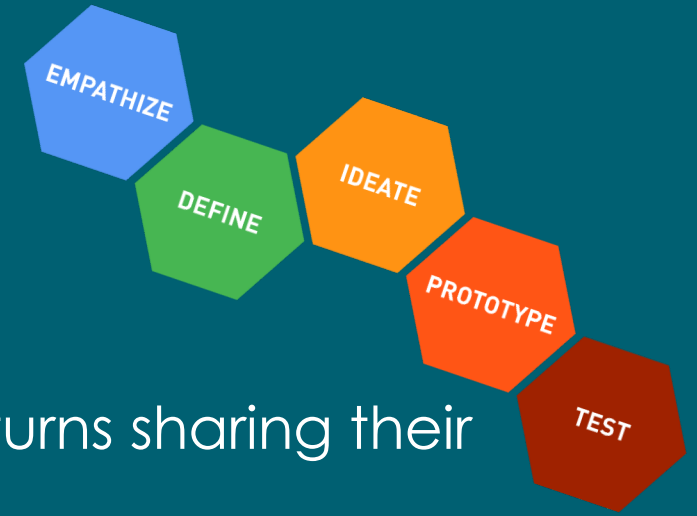
6. Redesign

(5 Mins)

▶ 5 mins on your own quietly, redesign an idea in box 6.

▶ Incorporate some of the feedback you got from your partner.

▶ Next stage will be sharing with your group.

EMPATHIZE

DEFINE

IDEATE

PROTOTYPE

TEST
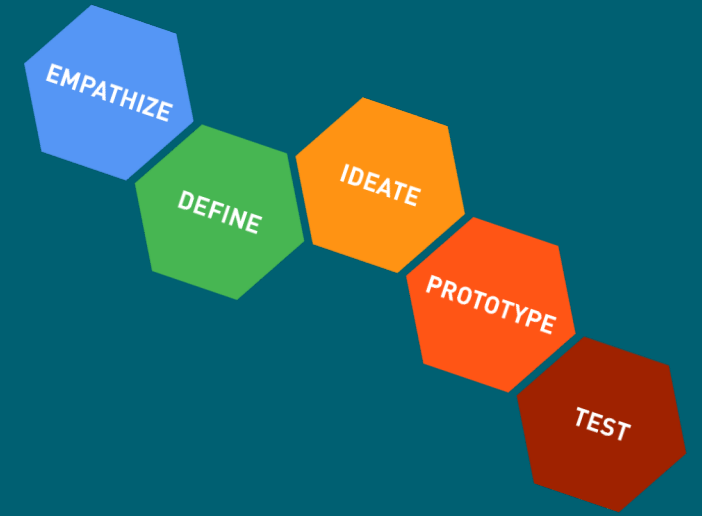
7. Group Idea

*** *Teacher Notes*

- In groups of 4, each member of the group takes turns sharing their idea

- Consider the first time you go through the process skipping this stage and letting the students build a prototype of their idea

- 2nd Design Challenge maybe 2 people negotiate one idea

- Eventually get to a place where the group of 4 students come up with one idea

- Everyone needs to fill in Box 7. That's your ticket to lunch!

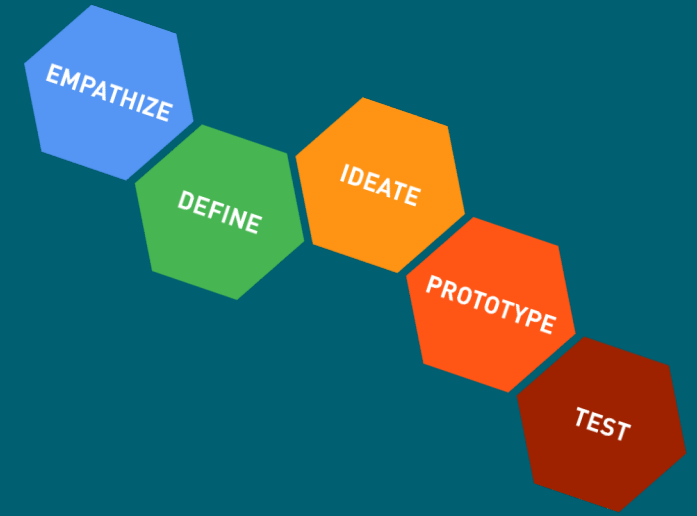 - Pushes the students to buy into the group.

7. Group Idea
(set time limit to match needs of group)
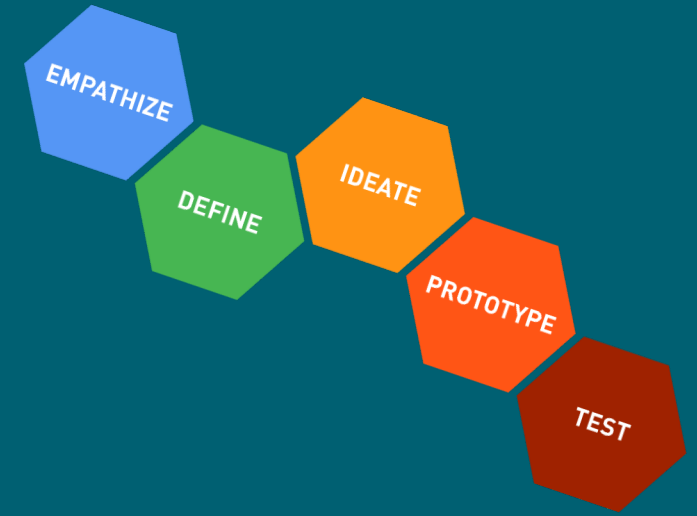
- In groups of 4, each member of the group takes turns sharing their idea
  - Or in partners negotiate one idea
  - Or after sharing build your own idea
- Eventually get to a place where students come up with one idea
  - Lots of negotiating

Prototyping
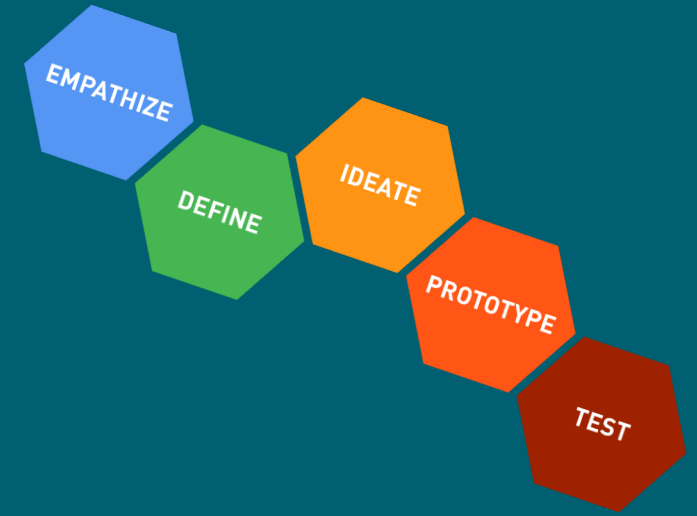*****Teacher Notes*

▶ This is the creation part

▶ Can stop after ideating though

▶ Doesn't have to have a time limit. May choose to do this over multiple classes

▶ Can be done individually, in partners or in groups

▶ Can have parameters on what and how much participants are to use.

▶ Usually a scaled version and/or metaphoric

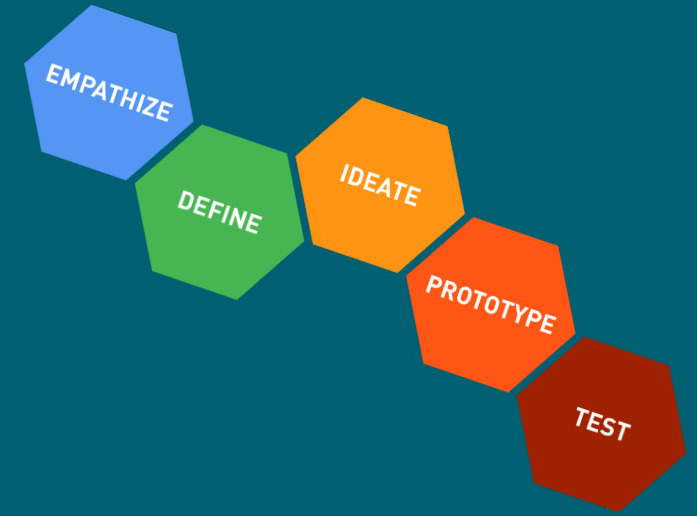▶ Could start as a scaled version and then full scale

Prototyping
(30 mins)

▶ With your group build a prototype of your idea

▶ Must use items in the bag

▶ Will be presenting your idea to your peers at the end of the day

Sharing with Class

*****Teacher Notes**

► Lots of flexibility on how the sharing is done.

  ►Gallery tour

  ►Present as group

  ►Have poster board with prototype on display for class and/or school

  ►Etc.

EMPATHIZE

DEFINE

IDEATE

PROTOTYPE

TEST

Sharing with Class
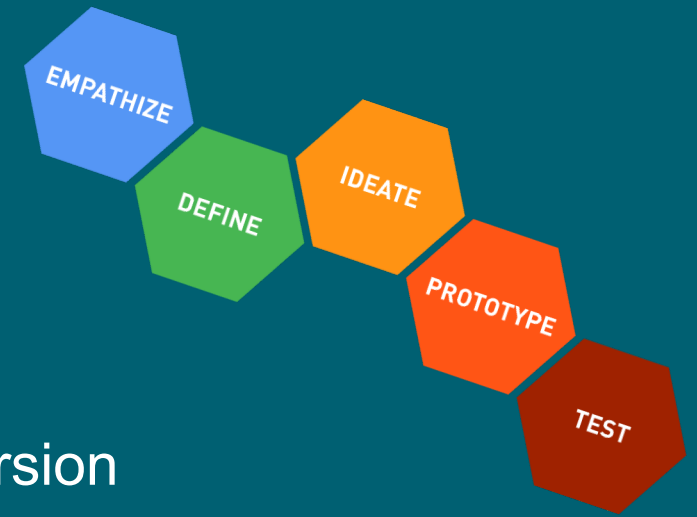
(30 mins)

▶ Each group present their prototype

▶ Be prepared to speak to the process / evolution of your idea

▶ Any comments about the design thinking process

▶ 5 minutes to prepare. 25 for presentations

EMPATHIZE

DEFINE

IDEATE
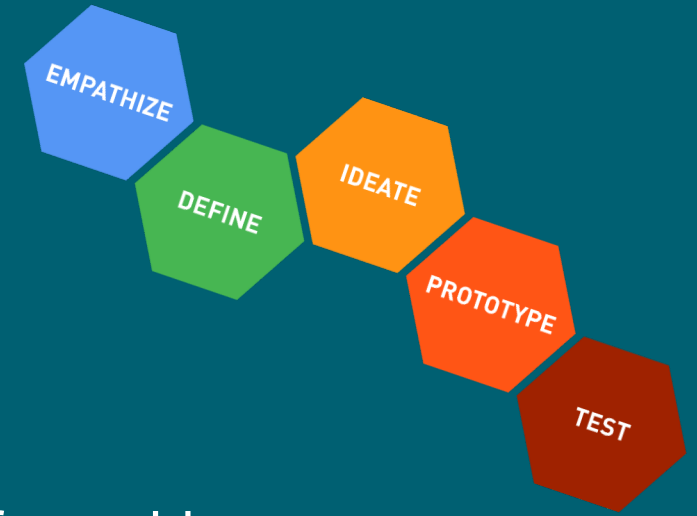
PROTOTYPE

TEST

Fabricating

*** *Teacher Notes*

► This is taking your prototype straight to a full size version

► May take multiple days or weeks depending on the complexity

► Can skip the scaled prototyping and skip straight to full scale prototype
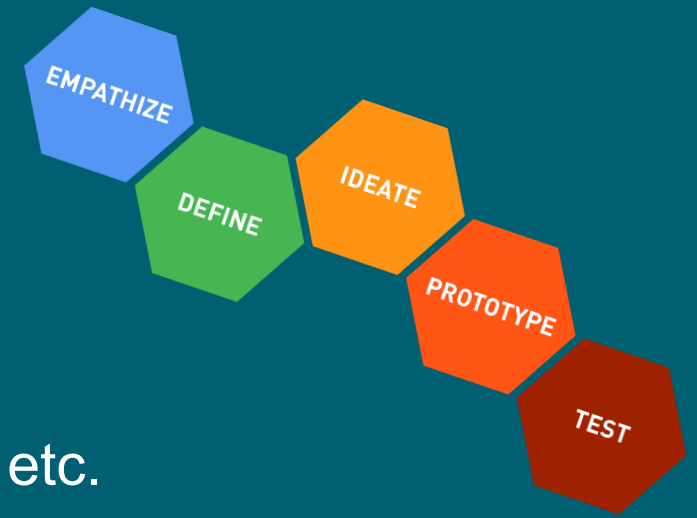
Test and Refine

*****Teacher Notes*

- ▶ This is where you take your fabricated project and test it
- ▶ Make adjustments / Refine
- ▶ Re-test
- ▶ Like the gravity cars

EMPATHIZE
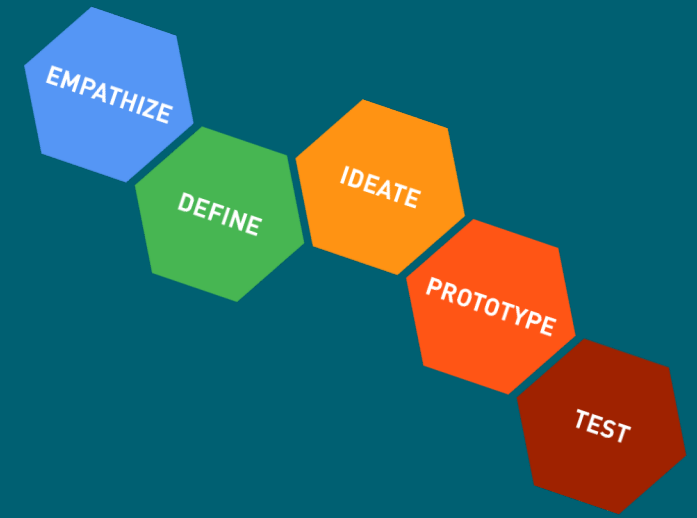DEFINE
IDEATE
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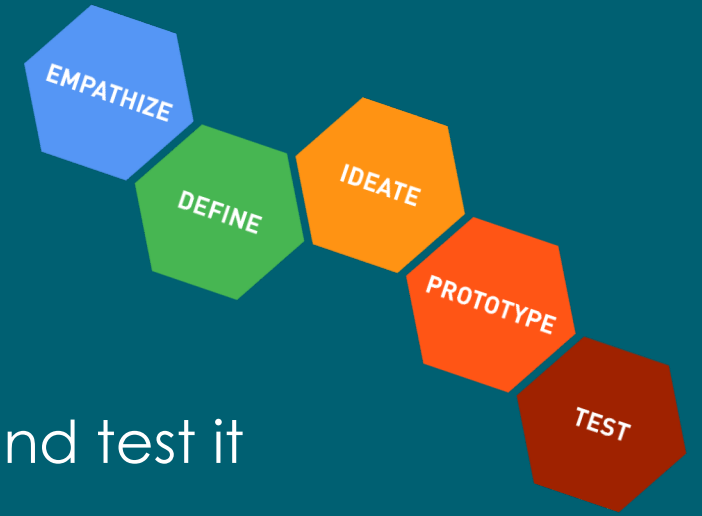
8. Reflection

*****Teacher Notes*

- ▶ Reflect on the process, team work, collaborating, etc.

- ▶ Think pair share

- ▶ Report out
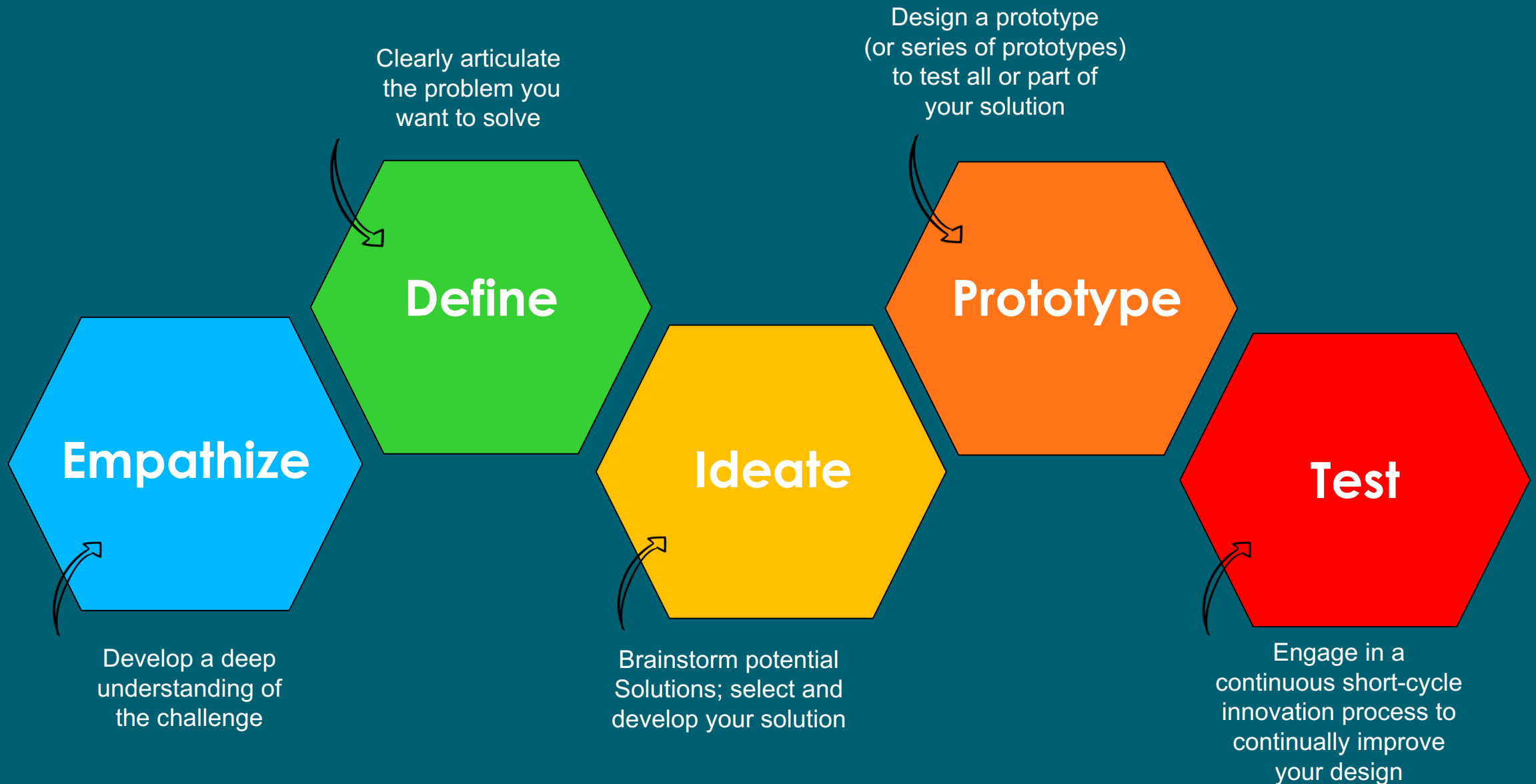
- ▶ Poster board
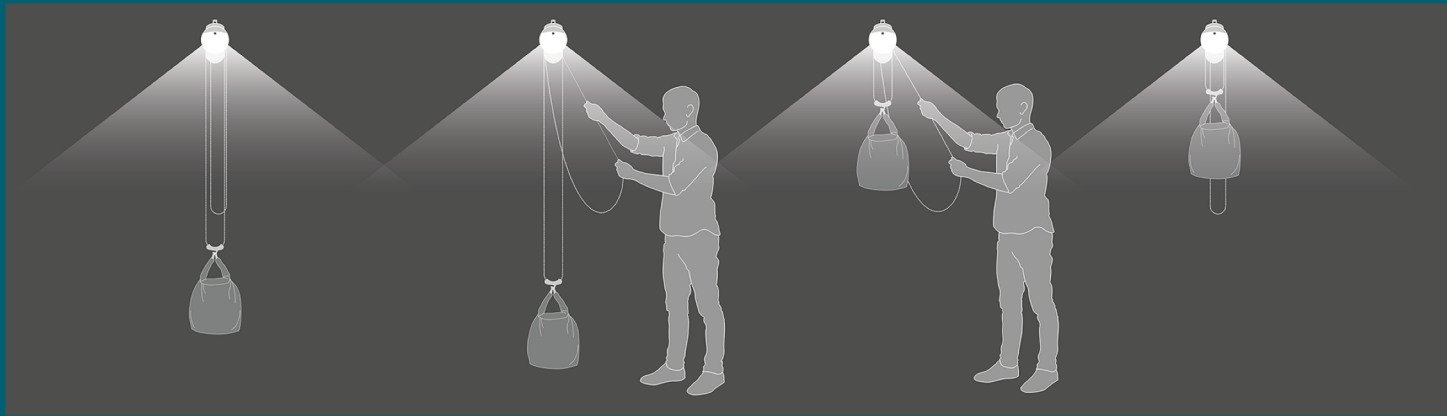
EMPATHIZE
DEFINE
IDEATE
PROTOTYPE
TEST

Conclusion

(Last 8 mins)

▶ Design Thinking can be applied to any problem.

▶ This is one variation

▶ Feel free to adapt it to meet the needs of your class

▶ Does not require a space. Design thinking can occur anywhere

▶ Try to hold onto key components

Key Components of Design Thinking

Empathize

Develop a deep understanding of the challenge

Define

Clearly articulate the problem you want to solve

Ideate

Brainstorm potential Solutions; select and develop your solution

Prototype

Design a prototype (or series of prototypes) to test all or part of your solution

Test

Engage in a continuous short-cycle innovation process to continually improve your design

Ideas, however outrageous, have changed the world, and they will again.

Rutger Bergman

https://www.wired.com/2017/04/dont-despair-big-ideas-can-still-change-world/?mbid=social_twitter