makedo® STEAM DESIGN CHALLENGE

‘CONNECTING PEOPLE’

THE PROBLEM

A local community needs your help!

A bad storm has destroyed the only bridge into their town. The river is very deep so there is no hope of being able to swim, wade or drive across. The river is too wide for just one piece of material to reach across and you and the townspeople need to get many things safely across the river.

Armed only with your trusty Makedo tools and cardboard, can you design a structure to bridge the gap?

YOUR GOAL	Use Makedo tools and recycled cardboard to create a bridge big enough to span a gap of 1 meter (3 feet) or more.
YOUR ROLE	You are the bridge engineer trying to get people safely across a dangerous bridge.
YOUR AUDIENCE	The bridge should be designed for cars, trucks buses and people.
THE SCENARIO	An isolated community is cut off from others and needs help.
THE PRODUCT	The product will be a prototype of a self-supporting bridge created using Makedo tools and recycled cardboard.

HOW TO USE THIS PROJECT SHEET

- As a class, inquire into the design problem. Use this sheet to guide students through the Makedo design thinking process to create your designs.
- Work with students to inquire, generate ideas, create prototypes and test their designs.
- Depending on your group’s age and ability use the “Go Further” section to extend the challenge.

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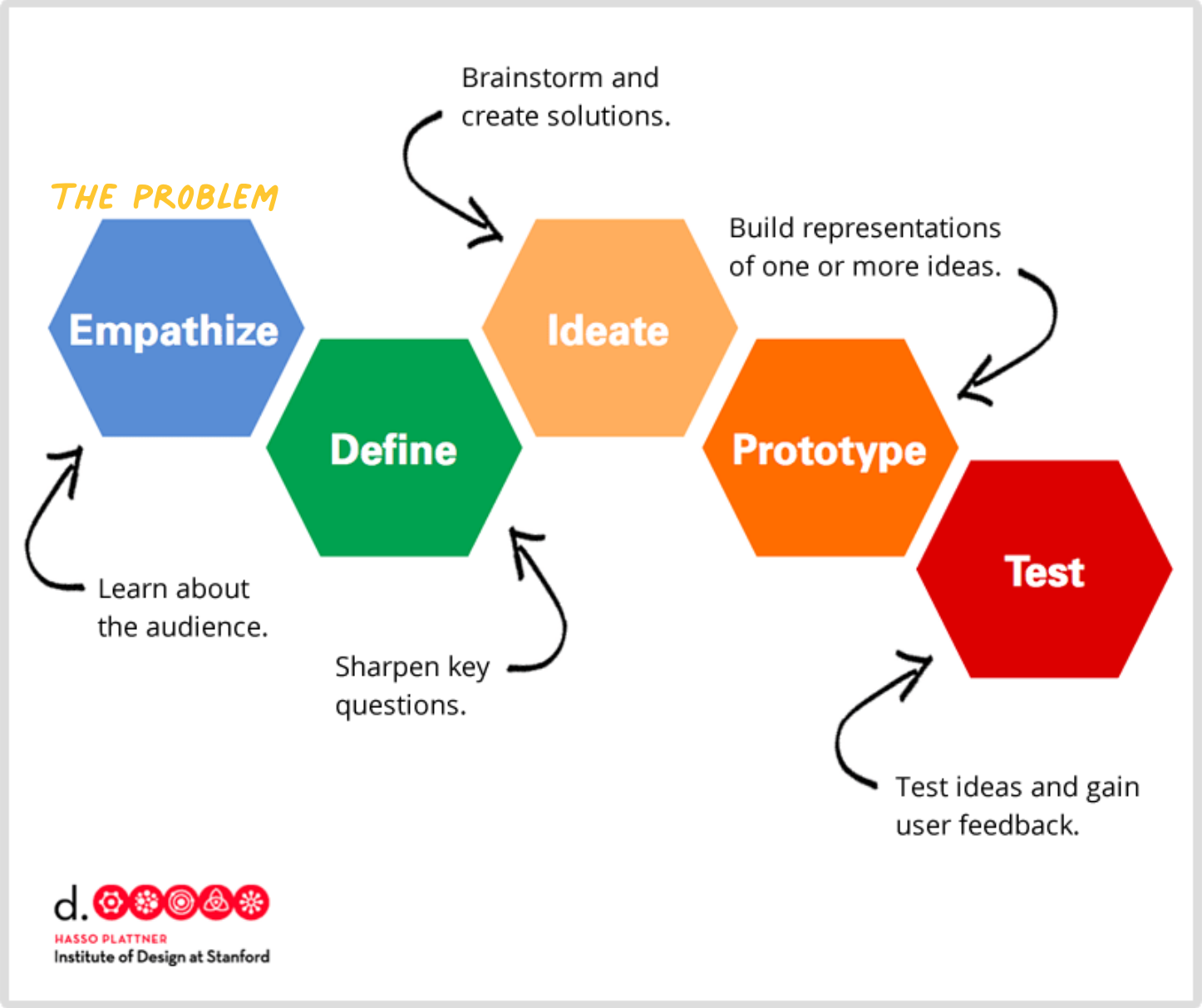
THE DESIGN THINKING PROCESS



USING THE DESIGN THINKING PROCESS

- When starting out you can work through each section step by step.
  As you become more experienced, you can rearrange the sections or jump back and forth between stages for a more authentic design experience.
  For example you could test an idea before making the final prototype!

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EMPATHISE

OBSERVE: What are the different parts of the problem?
Where is the problem happening?
What can we observe that will help us to design our own solution to the problem?
Who is involved; the users, clients and designers. These people are our stakeholders.

ENGAGE: Ask questions and learn everything you can about the design problem.
Why are we solving this problem?

CONNECT: What connections did you make between what you have found out and what you observed?
Talk to other designers about the problem.

DEFINE

FOCUS: What exactly is the problem we will solve?
How could we begin to solve the problem?
What things do we need to be aware of as we move forward?

PATTERNS: What connections did we make between what we found out and what we observed?
Talk to other designers about the problem.

NEEDS: What do our stakeholders need from a solution?
What are the essential things our solution must have?
How will we know if we have succeeded in solving the problem?

IDEATE

CREATIVITY: How can we represent different parts of the problem or initial ideas for solutions?
Are some ideas best represented with... Mind-maps? Sketches? Models?

FLEXIBILITY: How many different ideas can we come up with to solve the problem?
Do our ideas need to solve all aspects of the problem or just some?
How can we get feedback on our ideas?

DEVELOPMENT: How can we move from our first idea to the final design?
What rationale will we use to choose the best idea(s)?
How can we represent our final idea(s)?

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PROTOTYPE

BUILD: Even if you are not sure of all of the details, begin to create your design using recycled cardboard and Makedo tools. Using Makedo tools allows you to work with all kinds of recycled cardboard.

OPTIONS: Make sure to create multiple options or different versions of your ideas.
Remember these are prototypes, not final products.

RESOURCES: Using Makedo tools allows you to work with any kind of recycled cardboard and paper.
What can you find to work with?

USERS: Remember who you are designing for.
What are the needs and preferences of the users we identified earlier?

TEST

SHOW, DON'T TELL: Will we learn more about our prototypes by describing them to others or by showing them off?
What different perspectives will users have of our prototypes?
What can you learn from observing and listening to users while they experience your prototypes?

EXPERIENCES: Does your prototype create an experience for the users that explains how the product would work?
Is it okay if our prototype breaks or fails during testing?

COMPARE: Did you create multiple prototypes which can give users multiple options to compare and contrast?
Can we compare to other designers' prototypes to assess our own success?
Can we compare our prototype to existing real products?

KEYWORDS

Here are some keywords and terms you can explore to help you understand the design thinking process.

Design	**User**	**Span**
Empathise	**Engineer**	**Observation**
Define	**Structure**	**Solution**
Ideate	**Sketching**	**Perspective**
Prototype	**Modeling**	**Force**
Testing	**Resources**	**Load**

GO FURTHER!

LEVEL 1: Can you design a bridge that can hold more weight than any other design?

LEVEL 2: Could you make this design so it can be taken apart and reassembled for use in another emergency?

LEVEL 3: Can you build a bridge that builds itself or a mechanism that makes it easy to assemble?

SHARE YOUR CREATIONS!

Share your Makedo Design Challenge adventures with our Makedo community!

Upload here to be considered for our HUB

Post on Instagram and tag us @makedo

SCAN ME