

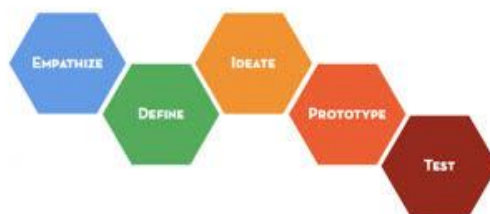
## Creative Problem Solving: Lesson 2

### Design Thinking

*Design Thinking originated in the tech industry and is used by innovators looking for ways to solve problems, make changes, and improve life for people around the globe. This process can be used to design any type of solution. Engineers use Design Thinking to assess the root problems of their end users and design solutions that work. Some educators use Design Thinking to design lesson plans. Even families could use Design Thinking to design a morning routine that gets everyone out the door prepared and happy in the morning.*

***In other words, Design Thinking is not just for engineers, inventors, and app developers. It is for all of us!***

*Design Thinking (also known as Human Centered Design) can be broken down in to a series of steps that help identify a design challenge and address it quickly. This packet explains the steps in greater detail and takes you through the steps to solve a problem for someone else in your class.*



#### **Empathize (Interview):**

The Empathize step begins by getting face to face with people and usually consists of interviews with all of the stakeholders. For this activity, your partner is the stakeholder. Your job as the designer is to put yourself in the stakeholder's shoes. Work to fully understand the challenges and resources that your partner has.

While you may have an idea of the problem– and maybe even a few ideas for solutions – be sure to interview your partner with an open mind and gather lots of information. Look for what the real issue might be. In the interview, you are looking for underlying issues or problems – and resources.

Use the space on the following page to record your interview notes.

**Interview and Empathize – 8 minutes**

- *Ask questions about the last time they did something related to the problem.*
- *Ask questions about why the issue is important to them.*
- *Look for: motivations, daily pressures, other needs.*
- *Think about: how their perspective makes them see the problem and other ways to see it.*
- *Try to dig a little deeper and look for aspects of the problem that aren't immediately obvious.*
- *Dig a little deeper and try to get to stories and emotions around the problem.*
- *Use open-ended questions that require responses that go beyond "yes" or "no".*
- *Ask "Why?" a lot.*

**Notes:**

**Define (the Problem):**

The Define phase steps back and looks at all of the information that has been gathered to determine what the design challenge really is. To define the problem, consider all of the information that you gathered during the Empathize step. *What does your partner need? What are some interesting insights that you have into the problem? What are some insights you have about resources that may help solve the problem?*

Additional research can sometimes help to better understand the resources and problem. You will probably not have time to conduct research this time. That's okay. This is practice!

You may identify several potential needs or problems. Reframe one need into a design problem. Choose one that you are excited to solve.

Define the Problem – 5 minutes	
Needs	Insights
	<i>Discoveries that may be useful when designing solutions</i>
<b>Problem Statement:</b>  _____ needs a way to _____ <i>(person or group)</i> <i>(user's need)</i> <b>Surprisingly /because/ but...</b> (circle one) _____	

*(insight)*

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**Ideation/Brainstorming:**

For many people, ideation is the fun part. It is the creative brainstorming of all of the possible solutions to the problem or design challenge. In Ideation, anything goes. Ideas can range from the seemingly obvious to the wildly impractical or even wishful thinking. Elements of impractical ideas may end up as part of a final solution, so don't edit yourself at all!

Be careful not to box yourself in to just brainstorming new inventions as solutions. Consider what other designs might do the trick. A new routine? A new process? A new habit? A training or lesson? What else???

Use the chart on the next page to sketch or write out at least 5 ideas for solutions to the problem you defined. If you have time after sketching five, keep going. You don't have to be an artist. Just get your ideas down on paper.

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After the Ideation step, your teacher will give you time to get feedback from your partner.

- What do they like about each of the solutions? Why?
- What do they not like about each of the solutions? Why?
- Dig deeper with why questions.
- Fight the urge to defend your ideas. Listen to their perspective to gain more empathy.

Use the chart on page 6 to write down notes about your partner's feedback.

Ideation/Brainstorm – 10 minutes	
<b>Idea 1</b>	<b>Idea 2</b>
<b>Idea 3</b>	<b>Idea 4</b>
<b>Idea 5</b>	<b>Idea 6</b>
<b>Idea 7</b>	<b>Idea 8</b>

<b>Idea 9</b>	<b>Idea 10</b>
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<b>Break for Feedback – 5 minutes</b>	
<b>Idea 1 Notes</b>	<b>Idea 2 Notes</b>
<b>Idea 3 Notes</b>	<b>Idea 4 Notes</b>
<b>Idea 5 Notes</b>	<b>Idea 6 Notes</b>



<b><i>Idea 7 Notes</i></b>	<b><i>Idea 8 Notes</i></b>
<b><i>Idea 9 Notes</i></b>	<b><i>Idea 10 Notes</i></b>

Reflect on the feedback from your partner. Which solution, or solutions, did they like best? Does one seem to rise to the top of the list? Could elements from one or two solutions be combined? Sketch out a detailed solution that you would like to prototype in the next phase.

**Sketch a Solution – 5 minutes**

**Prototyping:**

Prototypes are models that can be manipulated or tried out. If the prototype is a process, it may be a complete list of steps. If it is a product, it will be a physical object. Prototypes are NOT final products. They should be made quickly and cheaply to give an idea of how the product will work. They do not need to be perfect. For example, if you are trying to solve the problem that you partner drops their phone too often, your solution may be a special size and shape that fits better in their hand. Your prototype doesn't need to be a functioning phone. Just build a model phone in the size, shape, and feel that you think will not slip out of your partner's hand.

Prototypes may not be physical at all. Here are some other examples of prototypes that can be used to test a solution:

- Prototype a new process or action by drawing a series of numbered pictures or writing instructions.
- A new business could be prototyped first as a draft of a business plan.
- Early prototypes of a website or app could be several sketches of "screen shots". Later prototypes might be created with PowerPoint using hyperlinks to simulate buttons to move between slides/screens.

Create a prototype of your solution.

**Testing:**

In the Test phase, the prototype is put directly into the hands of the people who will use it (your partner) for feedback. Designers take notes and may go back to the prototype phase over and over again until the final product or process provides a satisfactory solution.

Failure in this phase is not only expected, but important! Use the feedback to think critically about why a prototype doesn't provide the perfect solution and to come up with new ideas. What parts work? What aspects are problematic and why?

Share the prototype with your partner. Have them actually use the solution by handling it, pretending to walk through the action, or any other way that you can get them to try it out.

Use the following page to take notes about feedback.

**Testing – Prototype Feedback – 5 minutes**

***Be sure to include:***

- ***Data, such as measurements, that may help you assess success of the solution.***
- ***Watch for how your partner uses (or misuses) the prototype.***
- ***What works?***
- ***What doesn't work? Any trouble spots?***
- ***What might work better?***

**Iteration:**

Assess your feedback. Should you make major or minor changes to your prototype in hopes of improving your solution? Would it make more sense to choose another brainstormed solution? Decide what you need to do to make a better solution for your partner and create another prototype to test.

Use your creative problem solving skills to come up with a new and improved solution!

Have your partner test your new prototype. Include notes on the bottom of this sheet or on the next page.

If you have time, continue to build and test new prototypes until time runs out or until you have developed something that really and truly works for your partner's problem.

