

# EDUCATOR GUIDE



# TEST

## Meta Moments

\*The more authentic the audience for the test phase the better (ie the user group or a good representative), however if you don't have direct access to the user group use class members to fill in.  
 \*If you are using class members to give feedback be sure to coach them on effective and ineffective ways to give feedback. Peers are often reticent to give feedback to one another.  
 \*Coach teams on recognizing that feedback will only make their final solution better  
 \* Presentations should be set up to show the idea and tell the story of the prototype.

## Make Sure...

**Before** – Students have multiple prototypes that they are ready to test and a clear idea of what they are testing, how will they record and incorporate feedback.  
**During**– Students take good notes and ask follow up questions on feedback received from user. Students set up testing presentations with lots of room for feedback from users.  
**After** – Students have a number of ideas of how to move forward and create a new prototype.

## Prompts

- What variables are you testing and how can you present your prototype to better test those ideas?
- How will you record feedback?
- Based on the feedback you received what would you do next?

## Description of Phase

The test mode is another iterative mode in which we place our low-resolution artifacts in the appropriate context of the user's life. In regards to a team's solution, we should always prototype as if we know we're right, but test as if we know we're wrong—testing is the chance to refine our solutions and make them better.

## Student Outcomes

- Show don't tell – the value of having a clear prototype in testing an idea
- How to incorporate feedback and iterate

## Strategies

<b>LEVEL 1</b> 1. Basic Presentation	<b>LEVEL 2</b> 1. 4 quadrant test
<b>LEVEL 3</b> 1. Testing Scenarios 2. Evolution of a prototype	<b>LEVEL 4</b> 1. Surveys 2. Real-World Testing

## Suggested connections to academic content

- History/English:** Effective oral presentations
- Science:** Designing an experiment to test a hypothesis
- English:** Story telling

# K12 WIKI PAGE

## ::HELPFUL FEATURES::

## CURRICULUM RESOURCES HOME

This is a collection of curriculum created by the K-12 Lab at the design school and teachers who are using design thinking in their schools. Please feel free to use all of the resources presented here. If you discover a new way to implement a lesson or run into a challenge with the particular constraints at your school please add feedback or comments in the feedback and comments section of the lesson. We have organized curriculum in multiple formats to so that you can search in the way that is most appropriate for your work:

## Activities Organized by Skill Level and Design Thinking Mode

	<a href="#">Empathy</a>	<a href="#">Define</a>	<a href="#">Ideate</a>	<a href="#">Prototype</a>	<a href="#">Test</a>
Level 1	<a href="#">1. Open-ended Questions</a> <a href="#">2. Video observation</a> <a href="#">3. Space Saturation</a>	<a href="#">1. POV Madlibs</a>	<a href="#">1. Simple Brainstorming</a> <a href="#">2. Paper clip Brainstorm</a>	<a href="#">1. Paper Prototype</a>	<a href="#">1. Basic Presentation</a>
Level 2	<a href="#">1. Basic interviewing skills</a> <a href="#">2. Observation vs interpretation</a> <a href="#">3. Field notes</a>	<a href="#">1. Empathy Map</a> <a href="#">2. other mapping techniques like Journey mapping</a>	<a href="#">1. Brainstorming with Rules</a>	<a href="#">1. Physical Prototype</a> <a href="#">2. looks like/works like</a>	<a href="#">1. 4 quadrant test</a>
Level 3	<a href="#">1. how/why laddering</a> <a href="#">2. Walk in the Moccasins</a> <a href="#">3. Whose Life</a>	<a href="#">1. Want Ad</a> <a href="#">2. 2X2s</a>	<a href="#">1. Visual Brainstorming</a> <a href="#">2. Bodystorming</a>	<a href="#">1. Role Playing</a> <a href="#">2. Prototype to decide</a> <a href="#">3. Identify a variable</a>	<a href="#">1. Testing Scenarios</a> <a href="#">2. Evolution of a prototype</a>
Level 4	<a href="#">1. Powers of 10</a> <a href="#">2. Community map</a>	<a href="#">1. Metaphor</a>	<a href="#">1. Crowd Sourcing</a>	<a href="#">1. Prototype intangibles</a>	<a href="#">1. Surveys</a> <a href="#">2. Real-World Testing</a>

# ::OTHER K12 WIKI HIGHLIGHTS::

## MATERIALS LIST

FIND A LIST OF SUPPLIES TO GET YOU STARTED

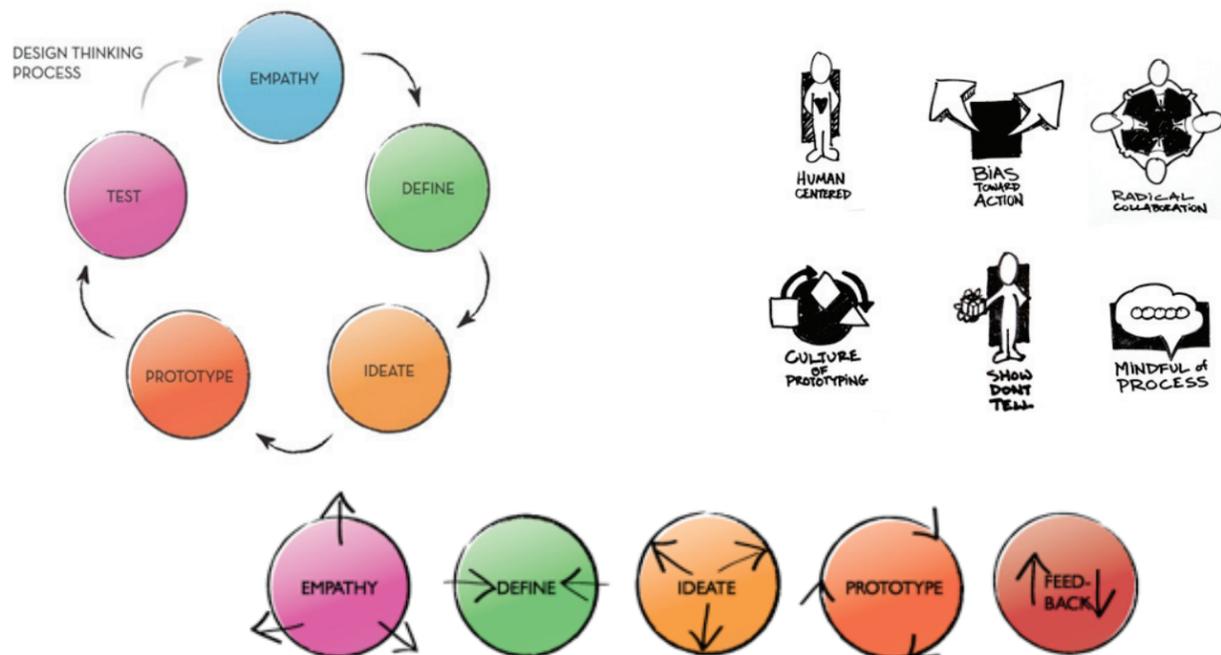
### POSSIBLE MATERIALS

- DUCT TAPE
- GLUE STICKS
- PAPER CLIPS
- SCISSORS
- HOT GLUE/GLUE GUNS
- ASSORTED PIECES OF FABRIC/FELT
- PIPE CLEANERS
- STICKERS
- YARN
- STICKERS
- HOLE PUNCHER
- POST-ITS
- RULERS



## VISUAL RESOURCES

FIND IMAGES OF THE DESIGN PROCESS AND MINDSETS



# PROTOTYPE

## Description of Phase

Prototyping is the iterative development of artifacts – digital, physical, or experiential – intended to elicit qualitative or quantitative feedback. The act of prototyping implies “building”, testing, and iterating and is, itself, both a flaring and a narrowing process. The flaring represents the proliferation of low-resolution prototypes developed as different aspects of the prototype are evaluated. The narrowing represents the refinement of the lower resolution models into increasingly complex and resolved models based on feedback, that leads to an even better understanding of the users needs.

## Meta Moments

- \* We give students relatively little time to prototype so that they don't get attached to ideas and are open to feedback and iteration
- \* Failing early leads to much better final products. This is not obvious to children as traditional education rarely promotes this.
- \* Building to think get students in the mind set of “doing” rather than thinking.

## Make Sure...

**Before** – Students have a variety of ideas to select from and move forward on.

**During**– Students have access to prototyping materials. Students build prototypes rapidly so they are easy to change

**After** – Students have multiple prototypes that they are ready to test and a clear idea of what they are testing, how will they record and incorporate feedback?

## Student Outcomes

- The value of building to think (Bias towards action)
- The importance of rapid prototyping

## Strategies

<b>LEVEL 1</b> 1. Paper Prototype	<b>LEVEL 2</b> 1. Physical Prototype 2. looks like/works like
<b>LEVEL 3</b> 1. Role Playing 2. Prototype to decide 3. Identify a variable	<b>LEVEL 4</b> 1. Prototype intangibles

## Suggested connections to academic content

- **English/History** - Multiple drafts of papers
- **Math** - Identification of a variable
- **Social Studies** - Prototype to decide, decision making skills
- **Art** - Sketching

## Prompts

- How to select an idea (voting) (Most feasible, ground breaking, exciting, functional, the darling, long shot and the safe choice)
- What variables do you want to better understand?
- What questions to we have about our idea?
- How can we make our idea tangible and in a way that gives us the feedback we need?

# IDEATE

## Meta Moments

- \* Space matters - playing fun music, setting up a space that allows for students to stand or move around as they are generating ideas adds to this experience.
- \* Scope and definition of brainstorming prompts will influence how long the brainstorm has steam.
- \* One brainstorming skill is knowing when to navigate to the next brainstorming prompt (when energy has died on a given topic).
- \* Think about selecting a facilitator for each group who will enforce the rules and maintain a positive brainstorming atmosphere.
- \* This is about not owning ideas but encouraging teammates to generate.

## Make Sure...

**Before:** Students have a defined problem: user, need and insight. They have multiple brainstorming prompts “how might we’s” to brainstorm off of. You might want to combine groups to have 6-8 students brainstorming in a group.

**During:** Students have high energy, are following the brainstorming rules (especially being visual and deferring judgment), and are listening to each other and building on each other’s ideas. When student group energy gets low, encourage the group to move on to a new prompt or to do a warm-up improv activity to get energy up.

**After:** Students (as a group) have selected around 3 ideas to move forward by voting. See prompts on the prototyping page.

## Prompts

What new ideas do we have that will meet the needs of our user?

## Description of Phase

Ideation is the process of idea generation. Mentally it represents a process of “going broad” in terms of concepts and outcomes. Ideation provides the fuel for building prototypes and driving innovative solutions.

## Student Outcomes

The value and benefit of following the brainstorming rules: being visual, building on other’s ideas, deferring judgment on ideas.

## Strategies

<b>LEVEL 1</b> 1. Simple Brainstorming	<b>LEVEL 2</b> 1. Brainstorming rules
<b>LEVEL 3</b> 1. Visual Brainstorming 2. Bodystorming	<b>LEVEL 4</b> 1. Brainstorming

## Suggested connections to academic content

- **History:** Look at a decision that was made in history and brainstorm different potential solutions
- **Social Studies:** Look at current event, create “how might we’s” and brainstorm possible solutions
- **Science:** Brainstorming hypotheses for an experiment
- **English:** Brainstorm characters, problems, etc for creative writing

# CREATING A DESIGN CHALLENGE

(IN 5 MINUTES BY USING THE DESIGN PROCESS)

The framing of a Design Challenge sets the stage for student teams to explore characters and problems within a situation. The best framing does not constrain them to one problem to solve nor leave it too broad that they have trouble finding tangible problems.

## Step 1 Plan Empathy ->

List Settings that are both interesting to your students and have the potential to embed curricular content. Each setting should have between 3 and 6 potential Characters and at least 4 Potential Problems. It is common during the course of the Design Challenge for students to discover unanticipated problems.

## Step 2 Develop Define/Ideate ->

Chose a setting and write 3 versions of a statement that captures the situation. Use the scaffolds to the right to help. If you get stuck, try a new setting.

## Step 3 Prototype and Test ->

Pick one of the statements you generated and test it to make sure that it is properly scoped for a rich design challenge. The questions on the right are helpful in testing that a challenge is properly scoped.

### Settings

Ex. A local park

### Characters

Kids who play there  
Parents  
Animals

### Potential Problems

Litter  
Habitat disruption  
Park financial viability

Redesign the \_\_\_\_ (situation) \_\_\_\_ experience .  
Design a way for \_\_\_\_ (specific group of people) \_\_\_\_ to better \_\_\_\_ (situation) \_\_\_\_ .  
How might we help \_\_\_\_ (achieve some goal) \_\_\_\_?  
Ex. How might we keep the park clean? Design a way for people at the park to better support native animal life.

By working with the statement above will students have the opportunity to address multiple characters, problems and character needs?

If not, make the statement more broad.

By working with the above statement will students be able to find similarities between characters, problems, and needs?

If not, make the statement more narrow.

**When you feel you have a Design Challenge, write it down and begin.**

# EMPATHY

## Meta Moments

- \*Having students brainstorm before empathy is a great way to illustrate the value of the empathy stage.
- \*Students find real people facing real problems compelling.
- \*Students may need to be coached on staying objective and refraining from jumping to solutions too early in the process.
- \* Empathy experiences such as interviews and other open-ended approaches lead to unexpected outcomes and discovery of unique problems.

## Make Sure...

- Before** – to provide a range of empathy experiences (varying perspectives as well as activities – allow for stories, feelings, problems etc...)
- During** – Students use follow-up questions. Students diligently record (notes, video etc) peoples' responses.
- After** – Students have collected diverse empathy artifacts (stories, pictures etc...)

## Prompts

- Who should we talk to?
- Who can we learn from?
- What is the experience of our user?

## Description of Phase

Design thinking is a user-centered design process, and the empathy that comes from observing users enables design thinkers to uncover deep and meaningful needs (both overt & latent). Empathy, by definition, is the intellectual identification with or vicarious experiencing of the feelings, thoughts or attitudes of another. Three main techniques are used to gain empathy: interviewing, observation, immersion. The goal of the empathy mode is to discover gaps in between what people do and what people say they do. These gaps are the design opportunities.

## Student Outcomes

- The value of building empathy to discover deeper needs
- Skills needed to understand user

## Strategies

<b>LEVEL 1</b> 1. Open-ended Questions 2. Video observation	<b>LEVEL 2</b> 1. Interview Techniques 2. Obs. vs interpretation 3. Field notes
<b>LEVEL 3</b> 1. How/Why Laddering 2. Walk in the Moccasins 3. Day in the life	<b>LEVEL 4</b> 1. Powers of 10 2. Community map 3. Surveys

## Suggested connections to academic content

- **History:** Research techniques - approach a research paper like an empathy experience
- **Science:** Observation and the scientific method
- **English:** Write a paper that will be interesting to a particular target group (complete empathy build to understand that group)

# DEFINE

## Description of Phase

The Define mode is seen as a 'narrowing' part of the process. After collecting volumes of user information, it is time to distill down to one specific user group, their need and the insight behind that need so as to unify and inspire a team. The goal of this mode is to come up with at least one actionable problem statement (often referred to as Point of View (POV) that focuses on the insights that you uncovered from real users.

## Student Outcomes

The process of determining a unique human centered problem from a large, unorganized set of information.

## Strategies

<b>LEVEL 1</b> 1. Madlibs	<b>LEVEL 2</b> 1. Empathy Map 2. Other mapping techniques
<b>LEVEL 3</b> 1. Want Ad 2. 2x2s	<b>LEVEL 4</b> 1. Metaphor

## Suggested connections to academic content

- English:** Developing a metaphor or want ad to describe project problem statement.
- History:** connect to the concept of a thesis statement for a term paper
- English:** Character description

## Meta Moments

- \* Defining a problem statement is one of the most challenging steps in the design process. Giving students more structure (see strategies) can be very helpful
- \* Be sure to allow plenty of time for this stage. It will set students up for the rest of the design challenge.
- \* The more rich the information, the more options students have when narrowing to a specific problem.
- \* There is no right way to do it, but multiple approaches and some time lead to rich insights. It's more of an art -- decision making and inference.

## Make Sure...

- Before:** Students have a range of information including: quotes, pictures/drawings, descriptions of users' feelings. Students have a space to share findings i.e. whiteboard, table top, floor
- During:** Students should seek patterns in the information, form user profiles, detect implicit and explicit needs, capture surprising behaviors and feelings
- After:** Capture a unique user, need, and insight from all the data that describe a certain problem that a person or group is facing. Take that description and generate "how might we" statements that each deal with an aspect of your description.

## Prompts

- What type of information do we have?
- What patterns are there?
- What needs and insights can we find?