An Educator’s Guide
To Design Thinking

Included in this guide:
- A teaching guide
- Mindsets Map
- 7 quick tips for integration
- Success Stories
- Resources
This is a collection of curriculum created by the K-12 Lab at the Stanford design school and teachers who are using design thinking in their schools. Please feel free to use all of the resources presented here.

Activities are organized by skill-level and phase of the design process:

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Site also includes:
- Handouts
- Materials
- Videos
- PowerPoints...
- And more...

Videos/additional info on Design Thinking:
http://www.kdtconsulting.org/design-thinking/links-to-design-thinking-resources

A variety of links that will give you a better idea of what design thinking is and how it can be used in the classroom.

IDEO Educators Tool Kit:
http://www.ideo.com/work/toolkit-for-educators

A free toolkit that contains the process and methods of design, adapted specifically for the context of K-12 education. It offers new ways to be intentional and collaborative when designing, and empowers educators to create impactful solutions.
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 so 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

Choose 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.

The following section provides an in-depth look at each stage in the Design Process with hints for how teachers can effectively incorporate it into their classrooms and ideas for how to connect it to standard curriculum.
EMPATHIZE

Description of Phase

Designers often begin their process by gaining empathy for their users. The goal of the Empathize phase is to discover gaps between what people do and what people say they do. These gaps are the design opportunities. Empathy, by definition, is the intellectual identification with or vicarious experiencing of the feelings, thoughts or attitudes of another. Designers generally use one or more of the following techniques to build empathy: interviewing, observation, immersion. During the Empathize phase designers must challenge themselves to maintain a “beginner’s mindset” so they can understand their users needs without bringing their own pre-conceived ideas to the table. This is a “Flaring” phase that should result in more ideas and insights in relation to the initial challenge.

Prompts

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

Make Sure...

BEFORE YOU START
You should aim to provide a range of empathy experiences (varying perspectives as well as activities – allow for stories, feelings, problems etc.).

DURING
Coach students to use follow-up questions. Remind students to diligently record (notes, video, etc) peoples’ responses.

AFTER YOU FINISH
Students should have collected diverse empathy artifacts (stories, pictures etc.).

Student Outcomes

- The value of building empathy to discover deeper needs
- Skills needed to understand user such as interviewing, observation and immersion.
- Observation vs. interpretation skills
- Interviewing and communication skills

Strategies

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<td>3. Day in the life</td>
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The following section provides additional resources to assist educators in implementing Design Thinking.
“By using Post-its to share ideas everyone — from the most talkative to the quietest teachers — had their voices heard.”

“What we really liked was the spontaneity and energy generated by the team as we went through the design thinking process.”

**ENHANCED TEACHING COMMUNITIES**
Many educators have found that Design Thinking helps to develop stronger, more vibrant teaching communities:

**STRONGER COMMUNITY RELATIONSHIPS:**
An interactive design workshop at a school in El Cerrito, CA, helped teachers appreciate the importance of empathy and inquiry when working in collaboration. Through a series of projects and challenges, they learned how to more effectively leverage each individual’s strengths and collaboratively work toward a common goal. This transformed what was initially a disparate group into a cohesive unit with a unique individual identity.

**EFFECTIVE COLLABORATION:**
Do you find your staff meetings consist of one or two people talking and everyone else quietly listening? Are there teachers at your school who feel shy to give input in a group setting?

Teachers at a secondary school in San Francisco used Design Thinking to address this issue and transform their staff meetings. They used the rules and strategies of brainstorming to get every member of the staff to contribute and come up with a wide variety of creative ideas. By using Post-its to share ideas everyone — from the most talkative to the quietest teachers — had their voices heard. As a result, the group came up with better solutions and all of the teachers felt empowered.

**INCREASED TEAM CREATIVITY AND ENGAGEMENT:**
To spice up weekly staff meetings, a project leader at an educational museum in the San Francisco area challenged a different member of the team to come up with a creative brainteaser to kick off the meeting each week. This got team members thinking creatively from the beginning of the meeting and helped to give each member a voice in the group. Brain teasers included brainstorming as many possible uses of a paper clip and conceiving ways to repurpose appliances.

**CHANGE IN SCHOOL MINDSET:**
A principal at a secondary school in Singapore remarked, “What we really liked was the spontaneity and energy generated by the team as we went through the design thinking process. Students have also given positive feedback about being more involved and having their views heard. Teachers’ mindsets have also been changed as they began to appreciate the importance of empathy and human-centeredness.”

Connection to 21st Century Skills

**Communication:**
*Interviews:* In the interview process students learn how to ask the right questions to elicit useful information. They also learn how to ask questions that will help them understand latent needs of their target audience.

*Communicating findings:* Once students have completed their research, they will share it back to the rest of their group. This process strengthens skills such as reporting and discussing.

*Understanding non-verbal communication:* Students will learn to watch people’s body language to understand what they may be thinking or feeling but not saying.

**Critical Thinking:**
*Determining relevant information:* Once students complete their research, they must share ideas back to their group. Determining which information is relevant and how to share it with the group is a good exercise in critical thinking.

**Collaboration:**
*Team research:* Design Thinking is generally done in teams and team members have to work together to develop and implement a plan for gathering information from multiple resources.

*Radical Collaboration:* In many cases students will gather information from a wide variety of people. Students will gain new perspectives by bringing disparate perspectives together from a diverse stakeholder group.

**Problem Solving:**
*Gaining deeper understanding of a challenge:* Students interview “users” to better understand specific challenges of a target audience and develop a high leverage solution. The empathy phase often reveals an underlying need that is at the root of the original problem.

Meta Moments
* Brainstorming 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.

Curriculum Connections

**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).

**Foreign Language:** Speaking and comprehension: students interview one another or watch a video in target language and determine needs of the interviewee.

**Middle School History:** Challenge students to design as if they were living in a different era. For example, design a boat using only the materials available to explorers.
DEFINE

Description of Phase

The Define phase is seen as a "narrowing" part of the design process. After collecting volumes of user information, designers must distill it down to one specific user group, their need and the insight behind that need. The goal of this phase is to come up with at least one actionable problem statement (often referred to as Point of View (POV)) that focuses on the insights uncovered from real users. This problem statement serves as a unifying theme for the rest of the design challenge. Designers use a variety of tools to structure the process of creating a clear Point of View. Some of these tools include structured "MadLibs" or creating metaphors that describe the user and his or her need.

Student Outcomes

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

Strategies

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Prompts

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

ART HISTORY:

An AP Art History teacher from Monterey, CA, successfully integrated Design Thinking into his classroom through a homework assignment. The original assignment consisted of answering simple reading questions to prove they had done the reading. After attending a workshop on Design Thinking the teacher gave the students a second option. He challenged them to capture their understanding of the reading in a sketchbook by pasting an image from the text and surrounding it with smaller sketches, quotes and interesting information. He asked that the final product be "an artifact of original mental activity." In the end the teacher felt that students who elected the sketchbook option were better prepared for the essay portion of the AP test. They had taken ownership of their learning and therefore, developed a unique relationship with the text.

LITERACY:

Have you ever wondered what your favorite characters would like if they existed in the real world? A middle school literacy coach in East Palo Alto, CA, used this question to teach her students how to infer. She challenged her students to complete Design Challenges for the characters in the books they were reading. This inspired the students to read more closely in order to better understand the characters. They had to learn how to infer what the characters would like or need, based on the information provided in the text.

Before using Design Thinking she had struggled to teach inference but once students started designing for the characters in books they blew the inference section of standardized tests out of the water. To learn more about this project check out this video: http://www.vimeo.com/13147136

MATH & SCIENCE

Seventh Graders saw just how relevant math and science can be when their math and science teachers assigned a joint design challenge around creating a playground. Students went to the local playground to watch other kids play. The teachers asked them to think about safety and notice where kids were bumping into one another. Based on their observations they designed a playground that was safe and easy for kids to use.

In their math class, the students built a scale model of the playground so they learned about fractions and percentages. In their science class, they were learning about simple machines so they built a model of one of the structures that would be on the playground.

Students were really excited to see how math and science worked in the real world and teachers reported that during the week of the design challenge they had 100% attendance.

“As a result of Design Thinking their reading comprehension improved 2 grade levels in just 20 weeks.”
"All the students loved the process and were genuinely proud of their design. It was a huge success."

The teacher was surprised by how well some of her generally lower performing students worked with the team to create high-quality results.

**VISUAL AND PERFORMING ARTS:**
A college preparatory school in Monterey, California had a tradition of designing a class T-shirt each year. The process was combersome, it would take months for students to decide what design they wanted, and the loudest ones usually had a disproportionate influence over the outcome. There was very little order or democracy to the process. Students inevitably became frustrated. The teacher wanted to try something new. The goal of the exercise was for the students create their own T-shirt design as a symbol to identify their class. Unfortunately, the lack of structure usually led to inefficiency and chaos.

Through Design Thinking the teacher streamlined the T-shirt design process while making it fun and democratic, efficient and exceedingly productive. As he recalls, “When I started designing the process I just wanted to make it work better. After thinking about what the T-shirts represented, I realized that they were really about identity. So I prepared a PowerPoint show about how artists explore identity in their work. Then an opportunity for exploration into legacy presented itself. So, I put together a PowerPoint show on Marketing and tied it in with legacy. After watching the presentations the students created a final statement that addressed their own identity and legacy.”

“After they created their statements, I had them do another brainstorming session. Then, I gave them T-shirts to create their first prototypes. Fortunately, the period they did their prototypes was just before lunch so they wore the prototype T-shirts to lunch and asked other students for feedback. The next meeting each group presented its findings and the whole gaggle of students voted on which T-shirt design they wanted. It was chosen with ease and buy-in from every student.”

“I then took the chosen prototype and made a mock-up of the design and presented it to the junior class representatives. We worked together refining the design until they were satisfied. We did this whole project in about 4 classes or one month, rather than the three months it used to take. All the students loved the process and were genuinely proud of their design. It was a huge success.”

**DESIGN THINKING ELECTIVE AND HISTORY:**
Students were given the unusual opportunity to relive history in their middle school Design Thinking class in Burlingame, CA. By challenging students to recreate historical events using tools such as models and simulations, the teacher was able to frame history lessons in ways students could relate to and understand. Historical events and ideas, like the Apollo 11 mission or a barter-based renaissance market, were brought to life through student lead projects. Students who had shown apathy in other classes became visibly engaged and worked well in teams - this lead to a dramatic improvement in the quality of their work.

**Connection to 21st Century Skills**

**Critical Thinking:**
The Define stage requires the use of a number of advanced critical thinking skills. Students are challenged to bring together a large body of research that they gathered during the Empathize stage to determine what is relevant to their challenge. They also have to develop a set of criteria for how they will prioritize information. Finally students must synthesize all of the information they have gathered into a single problem statement that will guide the rest of their project.

**Collaboration:**
Students create a new problem statement during the Define phase. This statement is a result of research conducted by the entire team of students and to ensure that it is accurate all students must agree on the final problem statement. Each group member will bring their own perspective to the table. The process of coming to a consensus on how to move forward can be challenging yet valuable.

**Communication:**
Students are challenged to communicate their ideas and understandings clearly to one another. Once the problem statement is determined the group has a clear way of communicating their direction and insights to outside observers.

**Problem Solving:**
During the define stage students are challenged to develop a clear problem statement. By clarifying the exact problem they are trying to solve students are better equipped to come to an effective solution.

**Connections**

- **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.
- **Data Synthesis:** Determining which information is relevant and pertinent from a wide range of information.
- **Science:** Developing a purpose or hypothesis for a scientific experiment based on a wide body of information.
IDEATE

Description of Phase

Ideation is the process of idea generation. Designers take what they know about the user and their specific needs and begin to think about solutions. This is a playful phase. Designers remove the limitations of feasibility and brainstorm revolutionary ideas. There is a clear set of brainstorming rules, such as deferring judgment and “going for volume” of ideas and building off the ideas of others, which are designed to spur innovative thinking. This is the ultimate “flaring” phase in the process. 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 others’ ideas, deferring judgment on ideas.
- Understanding the power of collaboration in idea generation

Strategies

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INCREASED STUDENT ACHIEVEMENT AND ENGAGEMENT

Design Thinking increases student engagement. When students can see a clear connection between what they learn in the classroom and how it relates to their lives, they are inspired to learn.

MATHEMATICS:
A math teacher in Lompoc, CA, challenged her students to design new flooring for their classroom as a way to learn the concepts of perimeter and area. Students did extensive research, they interviewed the school custodian and made a trip to Home Depot to look at materials. At the end of the project the students took the standardized test that normally follows the unit. She was happy to report that her students “Blew the top off the test!” One student even said, “This is easy stuff!” Prior to using Design Thinking, teachers used lectures to teach perimeter and area and found it much more challenging to engage students.

Other teachers throughout the same district have had similar success using Design Thinking. Some teachers have even reported having difficulty getting students to go to recess because they are so excited about their projects. “Where has this been all of my years of teaching?” exclaimed a teacher after using Design Thinking to spice up a lesson.

PHYSICS:
Design Thinking lead to a marked improvement in the level of engagement and understanding of a high school physics class in Santa Rosa, CA. After completing a customized Design Thinking curriculum, the students were hooked on the subject. Concepts such as friction, light and sound were suddenly demystified and brought to life.

In one exercise students designed a performance shoe taking into account all of the forces that act on a runner’s foot. “That is so interesting!” ... “How does that happen?”... were comments and questions that became a regular part of the class dynamics during the Running Shoe project. Furthermore, the teacher noticed a significant improvement in the quality of the students’ final project presentations. She described them as “stunning” and was impressed by students’ ability to articulate a deep understanding of the concepts.

At the end of the class the teacher reported that over 50% of her introductory physics students showed a better understanding of the material than her AP physics students.
**Connection to 21st Century Skills**

**Creativity:**
*Idea Generation:* The ideate process helps students learn how to generate lots of ideas before selecting one. Students will learn to let creative ideas flow without judgment.

*Creative Spaces:* Space and materials can have a large impact on students’ creativity. Teachers can be transparent about adjustments they make to the classroom or atmosphere to help students unleash their creative potential. Some adjustments might include creating more vertical space in the classroom, creating collaborative worktables, or playing specific music during part of the class.

*Thinking Visually:* During the brainstorming process teachers encourage students to draw or build their ideas rather than write them. By drawing ideas students access different parts of the brain and will often come up with off-the-wall ideas that are groundbreaking.

**Communication:**
*Brainstorming Rules:* The brainstorming process works best when students follow a clear set of rules such as respecting other’s ideas, one speaker at a time, and deferring judgment. All of these skills are transferrable to collaborative work.

*Succinct statement of ideas:* For brainstorming to be most effective students will need to work on stating complex ideas in a simple clear statement.

**Collaboration:**
*Building on ideas of others:* One of the important skills of brainstorming is learning how to build on the ideas of others. This skill is also important in collaboration as it demonstrates the power of working as a group rather than as separate individuals.

**Critical Thinking:**
The final stage of the ideation process is determining which ideas your team will take forward to the next stage in the process. During this stage it is critical to preserve innovative ideas so students learn strategies for selecting multiple ideas that are both groundbreaking and feasible.

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**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 of brainstorming prompts will influence how long the brainstorm has steam.
- When energy has died on a given topic prompts move on to the next one.
- Try 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.

**Curriculum Connections**

**Social Studies:** Look at a current event, create “how might we’s” and brainstorm possible solutions.

**English:** Brainstorm characters, problems, etc for creative writing.

**Art:** Visual Brainstorming, students to draw all ideas.

**Assessment:** Determine student understanding of a concept based on how well they can brainstorm the topic.
Prototype to Decide

The design thinking process often stalls when teams begin to over discuss their next steps. The adage “prototype to decide” reminds us that instead of arguing about what the next idea when a team hits an impasse, create some quick prototypes and test each idea. Let the users decide what course of action you should take.

Think Visually

Communication is an essential ingredient of design thinking’s collaboratory working style. By biasing towards drawing and capturing ideas on Post-Its students and teachers can communicate their thoughts in a more accessible way. Furthermore, visual thinking creates artifacts that are easily accessible and malleable to an entire group.

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 both a flaring and a narrowing process. Designers build a variety of low-resolution prototypes to represent different aspects of the ideas to elicit feedback. As the prototyping phase progresses designers work to refine the lower resolution models into increasingly complex and resolved models based on feedback. Designers learn more about their user through the iterative process of prototyping. In the classroom, prototyping serves as a wonderful way to show students that failure is okay as long as you learn and effectively develop your idea.

Student Outcomes

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

Strategies

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<td>3. Identify a variable</td>
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Make Sure...

BEFORE YOU START
Students should have a variety of ideas to select from to build prototypes.

DURING
Give students access to variety of prototyping materials to inspire creativity.
Coach students to build prototypes rapidly so they are open to feedback and excited to iterate.

AFTER YOU FINISH
Students should have multiple prototypes that they are ready to test and a clear idea of what they are testing, how they will record and incorporate feedback.

Prompts

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

The design thinking process often stalls when teams begin to over-discuss their next steps. The adage “prototype to decide” reminds us that instead of arguing about what the next idea when a team hits an impasse, create some quick prototypes and test each idea. Let the users decide what course of action you should take.

Build to Think

Prototyping is not just a way to test an idea, it is a process that helps people think. Constantly surrounding students and teachers with low resolution materials encourages kinesthetic learning and communication. Objects like scrap paper, pipe cleaner, zip ties, tape, glue, old magazines, etc can be acquired quite cheaply and are amazingly versatile.

Search for Human Needs

At the core of design thinking is solving problems for people. Promoting this human centered approach means framing problems by describing them as human needs. Likewise, the success of ideas depends on how accurately and deeply they address the problems that others face.

Connection to 21st Century Skills

Creativity:

Building to think: Students learn to make physical representations of ideas in order to further explore the concepts. This is an important exercise for accessing different parts of the brain and unleashing creativity.

Iterating and building on ideas: It’s critical that a prototype is something people can interact with and develop new insights based on their interaction.

Failure is okay: Students will develop prototypes that do not meet their user’s needs. However, the process of building the “Flop” prototype will teach them that failure is okay because they can learn from it and come up with something far better than they would have if they hadn’t had their chance at creative failure.

Critical Thinking:

Determining which variable to test: A critical component of prototyping is determining which variable is the most valuable to test with a prototype. The process of determining which variable will provide the most insight develops important critical thinking skills.

Learning from Failure: Prototyping teaches the value of failing if you are able to learn from your mistakes. Through prototyping students will learn to critically evaluate their mistakes and determine a new approach to solve the problem more effectively.

Communication:

Presenting an idea: Prototyping allows students the chance to communicate their ideas in a visual or experiential manner.

Collaboration:

Prototyping is generally done as a team. Team members learn how to share ideas and build on the ideas of others as they work to make their ideas visual.

Problem Solving:

Creating a visual or experiential representation of an idea often inspires further innovation and allows students to understand different aspects of a given problem, leading to higher leverage solutions.

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 gets students in the mindset of ‘doing’ rather than thinking.

Connections to Curriculum

English/History - Multiple drafts of papers.

Math - Identification of a variable

Social Studies - Prototype to decide, decision-making skills

Art - Sketching

Math - Building scale models of ideas

Science - Building simple machines

Social Studies - Building a physical representation of an experience to develop new insights into a challenge.
TEST

Description of Phase

Testing is often the final stage in the design process. Designers take their prototypes back to the user to see if they created something that meets their user’s need. The goal of the test phase is to have the user interact with the prototypes and provide feedback. Designers should always prototype as if they know they’re right, but test as if they know they’re wrong—testing is not about justifying your idea. It is about learning how to make your idea even better. In some cases testing will lead circling back and repeating one or more of the phases of the design process.

Make Sure...

BEFORE YOU START
Challenge each student group to have multiple prototypes that they are ready to test and a clear idea of what they are testing, how will they record feedback.

DURING
Coach students to take good notes and ask follow-up questions on feedback received from user. Remind students to set up testing presentations with lots of room for feedback from users.

AFTER YOU FINISH
Check that students have a number of ideas of how to iterate on their current prototype.

Student Outcomes

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

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?

Strategies

LEVEL 1
1. Basic Presentation

LEVEL 2
1. 4 quadrant test

LEVEL 3
1. Testing Scenarios
2. Evolution of a prototype

LEVEL 4
1. Surveys
2. Real-World Testing

Brainstorm

Brainstorming is a fast, self-contained way to practice some of the core principles of design thinking. Having students or teachers run 5, 10, or 20 minute brainstorming sessions is a great way to teach the value of being generative. Conveniently, it can be used to help create solutions for virtually any type of problem, making it one of design thinking’s most versatile tools.

Don’t Yuck My Yum

Creating a positive, supportive atmosphere is essential to sustained design thinking. The most common way this is violated is by giving unconstructive feedback. Students at the Aspire School in East Palo Alto while practicing brainstorming came up with the phrase “don’t yuck my yum” to remind each other to give only positive feedback. Designing similar reminders forms a safe space for student creativity.
7 things you can do tomorrow

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More Vertical Writing Space
Space is a fantastic way to support and teach design thinking. The d.school is an example of a building dedicated to support our way of working. But most of what our space enables can be recreated cheaply by adding more vertical writing space. Here teachers at East Palo Alto Phoenix Academy gave butcher paper to students who created their own dynamic team studio.

Connect to 21st Century Skills

Communication:

Storytelling: During the testing phase of the process students need to effectively show their idea to their test group in an effective way so that they can understand what they are looking at and it works.

Effective Feedback: A large part of the testing phase is learning how to give and receive feedback effectively. It is generally good to provide students with a separate class and extra tools on how to give, receive and incorporate feedback.

Critical Thinking:

Evaluating the ideas of others: Students will often serve as testers for one another’s ideas. Learning how to critically evaluate and provide constructive feedback on another person’s ideas is an important skill to develop as a design thinker.

Analyzing and incorporating feedback: As students receive feedback on their ideas they will need to learn how to determine which feedback to act on and how to make sometimes abstract feedback ideas into concrete adjustments to their current design.

Collaboration:

Testing allows students to work with others, sometimes other students and sometimes outside parties, to determine next steps in an idea. The testing process demonstrates that great ideas often come from the minds of many.

Creativity:

Testing is an important part of the iteration process. If done well, students will expand their creativity skills by continuing to look for innovative ways to address constructive feedback they’ve received.

Problem Solving:

The Test phase teaches students how to effectively evaluate their initial solutions to determine if they have effectively solved a problem. By presenting their ideas to others and soliciting feedback they experience the power of collaborating to come to the best possible solution.

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 access to the user group use your class.

*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 reluctant to give feedback to one another.

*Coach teams to recognize that feedback will only make their final solution better

* Coach students to tell the story of their prototype and let testers interact with it rather than giving a formal presentation

Connections to Curriculum

History/English: Effective oral presentations
Science: Designing an experiment to test a hypothesis
English: Storytelling
Interventions: testing different ideas with a student to determine which is most effective for their learning style
Science: Designing an experiment to test a hypothesis
Applying Design Thinking Mindsets in Your School

Bias Towards Action

Focus on Human Values

- "What do people need to be able to consider others?"
- "What do people need to be able to build empathy for others daily?"
- "What do people need to be able to incorporate empathy building activities into the standard curriculum?"
- "What do people need to be able to keep ideas fresh and open to outside input?"
- "What do people need to be able to engage people with ongoing projects and solicit feedback?"
- "What do people need to be able to decrease fear of failure?"

Be Mindful Of Process

- "What do people need to be able to continually discuss the importance of the design process?"
- "What do people need to be able to encourage reflection on and improvement of process?"
- "What do people need to be able to encourage use of design process in everyday work?"

Radical Collaboration

- "What do people need to be able to encourage diverse working groups?"
- "What do people need to be able to involve all community members in projects?"
- "What do people need to be able to leverage outside experts at our school?"

Show Don't Tell

- "What do people need to be able to encourage the showing of unfinished work for feedback?"
- "What do people need to be able to encourage visual thinking?"
- "What do people need to be able to encourage use of visuals in the curriculum?"
- "What do people need to be able to create a culture that encourages storytelling?"
- "What do people need to be able to encourage use of prototyping?"
- "What do people need to be able to encourage iteration?"
- "What do people need to be able to encourage experimentation with curriculum?"

This is a tool to help you think about different ways to incorporate design thinking into your school's curriculum. Some teachers and administrators may be completely new to these concepts and can think of these brainstorming prompts as a platform to launch new processes. Other teachers and administrators may be thinking using these mindsets for years and can use these prompts as a way to build on existing practices.