IGNITE!
an integrated design thinking and STEM curriculum

Good Morning Sunshine by Franklin Goldman
A Taste of Design Thinking
REDESIGNING THE MOBILE EXPERIENCE
Imagine what mobile devices will be in the future. AND, Jot your ideas of the ideal mobile experience in your design journal.
First, you learn a little about the problem space, in this case, Your partner’s use and needs for mobiles....
To solve your design challenge, DESIGNING the future of mobiles, you need to learn about your user by interviewing.
WHY???
TO BUILD EMPATHY FOR YOUR USER.
Develop Empathy and Discover User Needs

Let’s *design* a solution based on real situations and people’s needs.

Interview your partner. Write notes in your design journal.
Circle the needs you think are the most urgent/important for your partner. Create a needs chart in your journal like the one below based on your interview.

<table>
<thead>
<tr>
<th>USER</th>
<th>NEEDS A WAY TO</th>
<th>BECAUSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caring</td>
<td>Spend more time with child</td>
<td>because her child is 2 years old</td>
</tr>
<tr>
<td>Empathetic</td>
<td>Commute faster</td>
<td>because she needs to get things done</td>
</tr>
<tr>
<td>Busy</td>
<td></td>
<td>because she lives in a rented house</td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td>because she needs to save money</td>
</tr>
<tr>
<td>Protective</td>
<td>Have temporary energy saving</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>solutions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protect herself and her child</td>
<td></td>
</tr>
</tbody>
</table>
Define
Writing a Point of View Statement (POV)

Write a statement that captures your partner’s needs:

__________ needs a way to _______________________
because __________________________________________.
Ideate – Brainstorm

Write down all the ideas you can think of that can meet the need in your POV.
Prototype

Use materials in the classroom to create a prototype to meet the needs of your partner
TEST

Share your prototype with your partner

What worked?     What to improve?
Design Thinking Steps that we will learn
A Taste of Design Thinking II
REDESIGNING the School Cafeteria Experience...
Imagine how you can improve the cafeteria experience at your school. AND, Jot your ideas of the ideal cafeteria experience in your design journal.

This is an example of problem solving. Now let's try a design thinking approach!
First, you learn a little about the problem space, in this case, Student needs for cafeteria time....
To solve your design challenge, REDESIGNING the cafeteria experience, you need to learn about your user by interviewing.
WHY???
TO BUILD EMPATHY FOR YOUR USER.
Develop Empathy and Discover User Needs

• Let’s **design** a solution based on real situations and people’s needs.

• Interview your partner. Write notes in your design journal.
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</tr>
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Define
Writing a Point of View Statement (POV)

Write a statement that captures your partner’s needs:

__________needs a way
to______________________because__________
___________________________________.

“Define” by [Author’s Name]
Ideate – Brainstorm

- Write down all the ideas you can think of that can meet the need in your POV.
Prototype

Use materials in the classroom to create a prototype to meet the needs of your partner.
TEST

Share your prototype with your partner

What worked?  What to improve?
Design Thinking Steps that we will learn

- Empathize
- Define
- Ideate
- Prototype
- Test
Milk Fracking

http://dangersoffracking.com/

What goes in and out of

HYDRAULIC FRACTURING

DIVE DOWN
Coal Extraction

Coal in the earth and how it is extracted

How Coal Pollutes the Environment

• COAL POLLUTING PUGET SOUND?
• 60 Minutes, Powered by Coal
Harnessing Water for energy

http://www.youtube.com/watch?v=tpigNNTQi&list=PLBez0d6hXe0c8x8
Falling Water to Energy

http://www.youtube.com/watch?v=A4UaWt_pReY
Solar Cookers
Wind Turbine

How a Wind Turbine Works

The Tower

The Blades

The Disks
Energy Efficient House
Tour of Zero Gravity

http://www.youtube.com/watch?v=ZoKYSTFy4GY
Stanford students build zero energy home

http://abclocal.go.com/kgo/video?id=9050662&pid=9050661&syndicate=syndicate&section=
Hydroelectric dams

http://www.youtube.com/watch?v=tpigNNTQi_x8
The International Design Challenge
Designing Access to Energy Sources in the developing world
Design thinkers solve big problems.
But instead of designing solutions for EVERYONE...
THEY DESIGN SOLUTIONS FOR ONE PERSON.
THAT PERSON IS CALLED THE USER.
To solve your design challenge, DESIGNING ACCESS TO ENERGY SOURCES IN DEVELOPING WORLD, you need to learn about your user by observation and interviewing.
WHY???
TO BUILD EMPATHY FOR YOUR USER.
THAT is an important part of becoming a people-centered problem solver - A DESIGN THINKER.
Your goal is to develop empathy for your user, which means putting yourself in their shoes.
What is Empathy?
Empathy is NOT

~feeling sorry for someone

~a sense that you have had a similar feeling

~being compassionate
Empathy means...
and listening closely.
and sensing connections that need no words.
Empathy is feeling what someone else feels...
and asking questions about what you THINK you see.
HOW do you develop EMPATHY?
Your toolbox
You have to become a GREAT observer!
Your have to observe with fresh eyes.
How good an observer are you?

Source: http://www.youtube.com/watch?v=ubNP9QNEQLA
Describe what you observe in the following pictures.
Summing Up:

What makes a good observer?
First step—Building Empathy for the User

EMPATHIZE

DEFINE

IDEATE

PROTOTYPE

TEST
Living Without Lights
Construct an Empathy Map

Say

Think

Do

Feel
Gana – Life Without Lights
India – Kerosene Lamps
Solar lights in India
Ghana and India Videos
Debriefing Worksheet – Your Empathy Map

Think

Feel
Part 2: Point of View
Statement and Ideation

- EMPATHIZE
- DEFINE
- IDEATE
- PROTOTYPE
- TEST
Create a Point of View Statement.
POINT OF VIEW STATEMENT

______________ needs a way to ________________

(User name)                                                    (Verb)

because _____________________________.

(Surprising Insight)
Neema: New Teacher

http://www.youtube.com/watch?v=ewlHN9SGuv0
(0:47-1:18)
POINT OF VIEW STATEMENT

__________needs a way to _______________

(User name)                                                    (Verb)

because ____________________________________.

(Surprising Insight)
Shanda: First Year Teacher

http://www.youtube.com/watch?v=kcfD0GDKYiA&feature=related

(0:27-1:22)
POINT OF VIEW STATEMENT

___________ needs a way to ____________________
    (User name)                              (Verb)

because                                                                                       
    (Surprising Insight)
Design thinkers are PEOPLE-CENTERED PROBLEM SOLVERS.
Ideation

- Empathize
- Define
- Ideate
- Prototype
- Test
• Ideation/brainstorming having many ideas that could be solutions for meeting the needs of your users
BRAINSTORMING MINDSETS
Build on the ideas of your team!
Go for wild ideas!
Don’t judge other’s ideas... or your own!

Go for quantity!
Listen to others:
only 1 person talks at a time!
Keep your idea short-it has to fit on a post-it note!
Capture EVERY SINGLE IDEA!
Neema, a nervous first year teacher, needs a way to feel confident, because he wants to do a good job as a new teacher.

How might we help Neema feel confident?

Neema needs a way to remember his lessons, because he gets confused when everyone is staring at him.

How might we help Neema remember his lessons?

Shanda, a new teacher, needs a way to make her students enjoy learning because she wants them to have as much fun as she did when she was a student.

How might we help Shanda find a way to make learning fun for her students?

Shanda needs a way to feel prepared for her first day of teaching because she is nervous about having her first class of students.

How might we help Shanda feel better prepared for her first day?
HOW TO BRAINSTORM

1. Say your idea.

2. Write your idea on a post it note.

3. Stick it on a wall.
Idea Clustering
Rearrange your post-it notes into clusters by themes.
Idea Selection

Place a check mark next to your 3 favorite ideas.
Idea Sharing

Share your group’s top 3 ideas.
Part 3: Prototyping & Testing
A PROTOTYPE

... is NOT a model.

... does not have to LOOK or BE perfect.

... does have to give your user something to INTERACT with.

... does have to be something that gives your user an experience.
BUILD YOUR PROTOTYPES.
TEST

• Share your prototype with your partner

What worked? What to improve?
Presentation of Prototypes
Part 4: More on Empathy and Learning how to Interview
Each team should come up with a list entitled:

“HOW TO BE A GREAT INTERVIEWER!”
You are going to use what you learned now as you INTERVIEW YOUR USERS.

Let’s practice by doing some ROLE PLAYING.
GALLERY WALK
DIRECTIONS

EACH PERSON has 3 stars.

Walk around the room and read each group’s list.

Draw a star on YOUR 3 FAVORITE IDEAS.
Practicing Observation Skills

• [https://www.youtube.com/watch?v=vJG698U2Mvo](https://www.youtube.com/watch?v=vJG698U2Mvo)
The Community Design Challenge
Your DESIGN CHALLENGE is...

Redesigning Energy Conservation Locally
Because, small energy conservation actions by many can have large impacts.

Lots of little things add up.
Empathy

- Empathize
- Define
- Ideate
- Prototype
- Test
Interview Practice

http://www.youtube.com/watch?v=YwY9l38ou
xE
Construct an Empathy Map

Say

Think

Do

Feel
It is time to INTERVIEW YOUR USERS.
START YOUR INTERVIEWS!

Remember:

Go for stories!

Ask open-ended questions.

Ask why.
Taking Interview Notes

Jot notes about what the person being interviewed says and does. Pay attention to what they say the feel.
Construct an Empathy Map

Say

Think

Feel

Do
Part 2: Point of View
Statement and Ideation

1. EMPATHIZE
2. DEFINE
3. IDEATE
4. PROTOTYPE
5. TEST
Set up a way to create a POV by making a chart.

Your User | Needs a way to | Because
--- | --- | ---
Caring | Spend more time with child | because her kid is 2 years old
Empathetic | commute faster | because she needs to get things done
Busy | have temporary energy saving solutions | because she lives in a rented house
Protective | Protect herself and her child | because she needs to save money
Mother | | |
Point of View Statement

____________________ needs a way to ___________________

(User name) (Verb)

because _____________________________.

(Surprising Insight)
IDEATE
(Brainstorming)
BRAINSTORMING
RULES & MINDSETS
Build on the ideas of your team!

Source: http://www.childrenofbukati.com/photos/photo_2010_gymnastics_pyramid2.jpg
Go for wild ideas!

Source: http://sdzsafaripark.tumblr.com/post/13176848753/cheetah-cub-on-flickr-cheetah-cubs-have-a-long
Don’t judge other’s ideas... or your own!

Go for quantity!
Listen to others:
only 1 person talks at a time!
Keep your idea short-it has to fit on a post-it note!
Capture EVERY SINGLE IDEA!
1. Say your ideas.

2. Write them on a post-it note.

3. Stick it up with others

4. Generate many, many ideas
Rearrange your post-it notes into themes.
Idea Selection

Place a check mark next to your 3 favorite ideas.
As a team, choose your favorite idea to move forward to prototyping.
Prototyping

- Empathize
- Define
- Ideate
- Prototype
- Test
BUILD TWO PROTOTYPES PER TEAM
Testing/Feedback

Show your prototype and get feedback so you can make it even more valuable to the user
Capture User Feedback

What worked?

What didn’t?

What could be improved?

What would you do next?
Now you are design thinkers who will change the world...
The Marshmallow Challenge

Your goal is to build a structure that can extend off a table top with the materials provided.
See next Slide for extra video:

Cain’s Arcade. This is for inspiration and can be shown at any time.
One boy’s prototyping story:

Caine’s Arcade