Design Thinking Curriculum

Objective:

Children and adults are faced with challenges every day at home, school, and at work. Design Thinking is a creative process one can take to solve these difficult challenges in a "people focused" approach. In this unit, students will learn all about Design Thinking and the steps and process it involves.

Guiding Questions:

- What is Design Thinking?
- What is each step of the process?
- How have these steps been used in the world around us?
- How will I use this process in my own life to solve real world problems?

Materials:

- Design Thinking Curriculum
- Design Thinking: The Point of it All
- Design Thinking Slides *(for teacher use)*
- Design Thinking Notetaking Packet *(Lesson #1 – Lesson #13)*
- Wallet/Bag Challenge Packet *(Lesson #14 – Lesson #23)*
- Design Thinking Teacher Reflections

Resources:

- https://dschool-old.stanford.edu/groups/k12/wiki/956b6/Design_Thinking_Projects_and_Challenges.html
- Kelley, Tom & David Kelley (2013). Creative Confidence. New York: Crown Publishers.

****The following lessons should be taught together with the *Design Thinking Slides* and *Design Thinking Notetaking Packet*****

Lesson One: What is Design Thinking?

Show IDEO Shopping Cart Design Video Clip:

- https://www.youtube.com/watch?v=M66ZU2PCIcM
- Points from the video to point out:
    - People are working collaboratively
    - No "boss"
    - "Fail often to succeed sooner!"
    - "Encourage Wild Ideas!"
    - "One conversation at a time…"

Discuss the definition of Design Thinking and have students record in their note-taking packet (pg. 2).

Lesson Two: Design Thinking, Step One: *Immersion*

- Ask students to think back to the shopping cart video. What was the first step the people at IDEO took to begin solving their challenge?
- Define Immersion and have students take notes on pg. 3 of their packet.
- Show students the following two video clips to help define pieces of immersion:
- IDEO Toothbrush video: **Make no assumptions!**
    - https://www.youtube.com/watch?v=tvkivmyKgEA
- IDEO **Think Like a Traveler**:
    - https://www.youtube.com/watch?v=biyygL-tiY0#t=133.094767

Lesson Three: Immersion requires us to be Objective

- Students must learn what the word "objective" means and why it is so important when collecting data. Before defining the term, have every child observe a locker. Have them record information about the locker on pg. 4 of the note-taking packet.
- When students finish, let children share their observations. Record the student observations on the board. Then, ask students to try to split up all the data into two groups on pg. 5 of their note-taking

packet. When finished, discuss and share how children split up the findings into two groups.

- Guide children to see which pieces of data are **objective** and which are **subjective**. The goal is to have students split their data into OBJECTIVE data and SUBJCTIVE data.
- With that in mind, have student separate the findings again into two groups on pg. 6.
- It is important for students to learn in this lesson that, WE MUST ONLY USE OBJECTIVE DATA! What is it that we **see**, not the **judgments** or **opinions** we make.
- It is important that we not make assumptions!

Lesson Four – Six: Practice Observing Objectively

- Give each student their own "Immersion Notebook."
- Tell the class that, "We will spend the next few days observing different parts of the school. Only write down observable/objective data." Always leave time after each observation period to share the data and notice the objective data they may have found.
- Examples of places in school to observe:
  - Lunchroom
  - Recess yard
  - Main Entrance
  - Office

Lesson Seven - Eight: How does EMPATHY play a role in Immersion?

- A big part of Immersion is empathy. Empathy is the ability to understand and share the feelings of another. Have students record the definition on pg 8.
- **People** are important in the Design Thinking process, not necessarily ideas!
- Introduce Doug Dietz: The designer of the MRI machine. How did empathy play a role in his process?
  - Read story of Doug Dietz in Chapter 1 of Creative Confidence and show TED talk by Doug Dietz:
    - https://www.youtube.com/watch?v=jajduxPD6H4
  - Have students reflect on pg. 9 of the note-taking packet.

Lesson Nine: Design Thinking, Step Two: Frame

- In this step we want to gain some perspective. Take a step back and frame the challenge you found in your data. **Frame your challenge as an opportunity**. We do this by asking lots of "**H**ow **M**ight **W**e…" questions. This helps us take a large problem and narrow it down. Have students record notes on pg.10 of notetaking packet.
- Framing means listing **LOTS** of "HMW's" (How Might We……)
- Have students come up with "HMW's" that might have been used for the shopping cart challenge and the MRI challenge. They can record it on page 11 and 12 of their packet.

Lesson Ten: Design Thinking, Step Three: Imagine

- In this step we start to generate lots of solutions to our challenge.
- Get creative and resourceful - **Don't edit!**
- Cluster and label related ideas
- To build creativity, take something off the table or ask MANY "What if…" questions:
    - Play with constraints (***What if*** we had 1 million dollars?)
- How did we see this in the shopping cart video? Replay this section of the video clip. Point out the sketches, pictures, lists, post its etc.
- Look at the slogans on the wall in the background of the video: "Encourage wild ideas!"
- Have students take notes on pg. 13 of the notetaking packet.

Lesson Eleven: Design Thinking, Step Four: Prototype

- In this step, we create a **rapid** prototype. The word "rapid" is used because we don't want to waste time on just one prototype. We want to create many and learn from the mistakes of each one.
- Build, test, learn!
- Just do it!
- Fail Forward Fast!
- How did we see this in the shopping cart clip?
- Have students take notes on page 14 of the notetaking packet.
- Show IDEO Clip, "Treat life as an experiment": https://www.youtube.com/watch?v=Uk9COhH5GAo

Lesson Twelve - Thirteen: Design Thinking, Step Four: Prototype cont'

"The Marshmallow Challenge"

- ***Teacher's Note*: Make sure to read the directions from the link below and gather all the materials BEFORE class:
- http://www.tomwujec.com/design-projects/marshmallow-challenge/

- Read the directions carefully off of the Design Thinking Slides. It is also on pg. 15 of the notetaking packet. Make sure groups are prepared with the materials they need and understand clearly the expectations of the challenge.

- After completing the challenge, make sure students reflect on the experience. Students can take notes on pg. 16 of the notetaking packet:
    - What was it like working with a group?
    - Was there a leader or was it a team effort?
    - What were the strategies used?
    - What happened when there was failure?

- Teacher must stress the "Take Away Lessons" from the experience. Students can take notes on pg. 17 of the notetaking packet.
- **Take Away Lessons**:

    - **Prototyping Matters**: The reason kids do better than business school students is kids spend more time playing and prototyping. They naturally start with the marshmallow and stick in the sticks. The Business School students spend a vast amount of time planning, then executing on the plan, with almost no time to fix the design once they put the marshmallow on top.

    - **The Marshmallow is a Metaphor for the Hidden Assumptions of a Project**: The assumption in the Marshmallow Challenge is that marshmallows are light and fluffy and easily supported by the spaghetti sticks. When you actually try to build the structure, the marshmallows don't seem so light. The lesson in the marshmallow challenge is that we need to identify the assumptions in our project – the real customer needs, the cost of the product, the duration of the service – and test them early and often. That's the mechanism that leads to effective innovation.
- If there is time, students can watch the TED talk that can be found on the link above.

****The following lessons should be taught together with the *Wallet/Bag Challenge Packet*****

Lesson Fourteen: Now Let's Try Out the Whole Design Process!

- Wallet/Bag Design Challenge - Introduce the challenge.
- Introduce the Immersion page by modeling an interview for the students. Ask the students to take note on what they notice during the immersion interview.
    - What kinds of questions did I ask?
    - What kinds of answers did I get?
    - Are there questions I should have asked but didn't?
    - How did I gain empathy in my interview?

- Ask students to spend a quiet moment thinking about what questions they would like to ask their partner.
- Encourage children to bring in a wallet or special bag they have used in the past (if they have one) to show their partner.

Lesson Fifteen: The Interview

- Partners will interview each other on pg 2 and take notes - about 10 minutes for each interview. Remind students that the interview is not "taking orders." It should **not** sounds like this, "What color do you want it to be?" "What size do you want it to be?" Rather we should, "Go for stories!" and learn more about the person who will be USING the bag.
- Reflect as a class:
    - What was the interview process like?
    - How did it feel?
    - Was it difficult? Why? Easy? Why?

Lesson Sixteen: FRAME THE CHALLENGE

- Students should think of 3 HMW's they can use to help frame their challenge. MODEL for students. Record on pg 3.

Lesson Seventeen: IMAGINE

- Students should sketch 3 ideas that could support the needs of the user. Each idea should be different. Remind students to think outside the box! Get creative and resourceful! Record on pg 4.
- Model for students and show examples. What do you notice about my examples?

Lesson Eighteen - Twenty: PROTOTYPE

- Children should use the materials given to create a prototype. Halfway through, partners should check in with each other and receive/give feedback. This can help them tweak the prototype.
- Refer to the packet page 5 and 6.

Lesson Twenty One: Share Final Prototypes with Partners

Lesson Twenty Two:

- Have students reflect on their process on pages 7 and 8 of the packet. After, discuss as a class.

Lesson Twenty Three:

- Have students reflect on the entire Design Thinking Unit on pages 9 – 11. After, discuss as a class.