Design Thinking Framework

Reflection

Metacognition

Summarize Learning/Results

Analyze and summarize information

Link to prior knowledge

Uncover layers

Detach from final result

Widen focus

Imagining beyond the expected

Make connections

Question

Engage curiosity

Research

Determine constraints or requirements

Empathize

Generate lots of ideas quickly

Present

Choose best method of communication

Communicate with outside audience

Understand The Problem (Ask)

Communicate (Share Learning)

Imagine

Consider, extend, or expand upon prior solutions

Try again

Test design

Evaluate & Improve

Plan

Evaluate and choose the "best" idea

Reflection

Improve

Create

Mock up

Plan (sketch, outline, story

Apply knowledge learned

Failing forward

Analytical

Perseverance

Bring idea to life

Anticipate

Narrow focus

Detail thinking

Flexibility

Troubleshooting
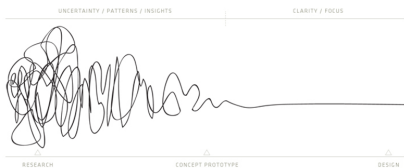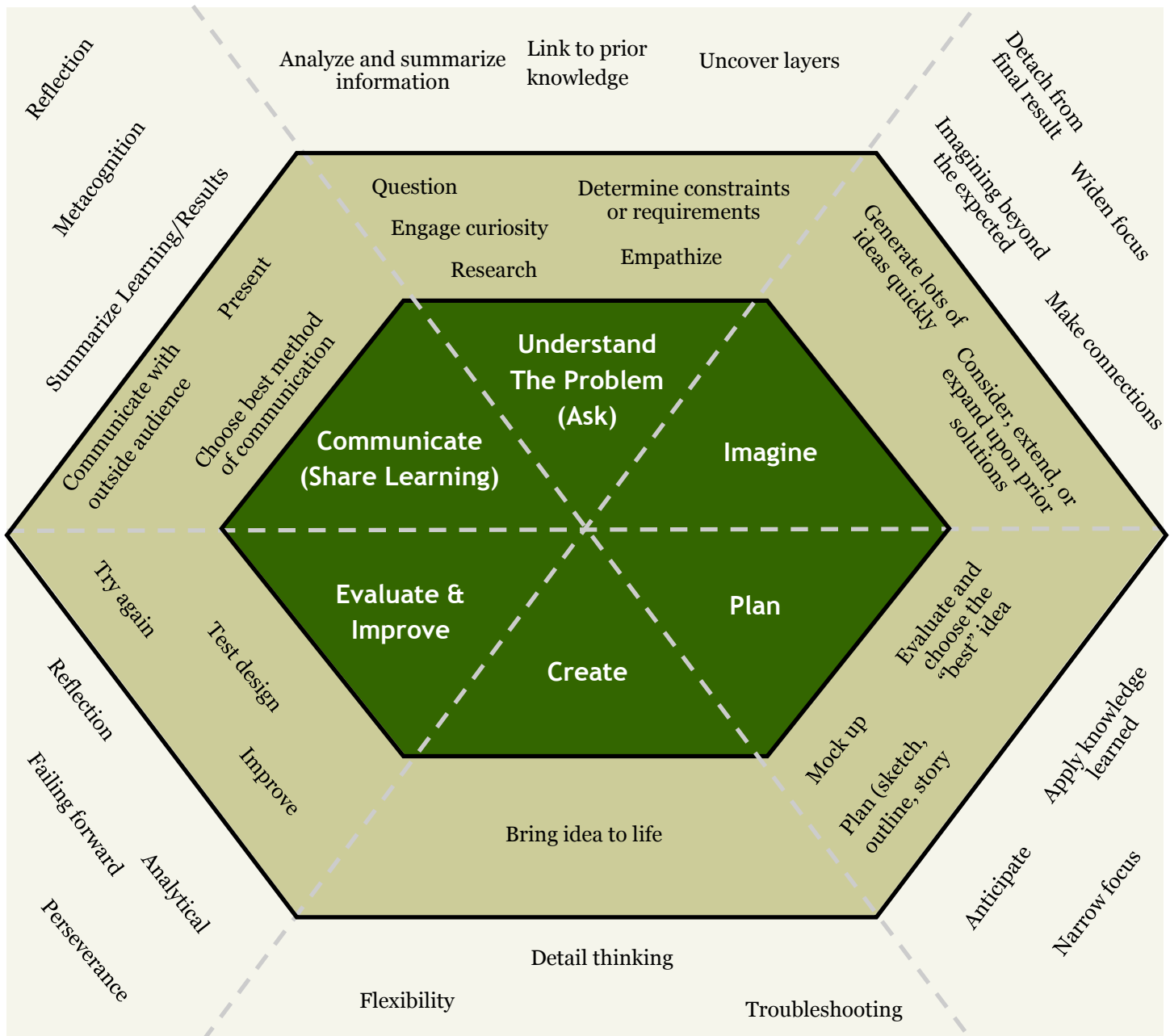
Brief explanation: This model is designed to capture how the design process supports students to develop thinking skills needed for success in college, careers, and life. The middle captures one way to visualize a design process. Typically design process are visualized as steps in a circular diagram; however, as captured by the design squiggle design work is rarely linear. This model looks at the steps in the process as phases with the dashed lines representing the blended nature between the phases.

The second layer (in beige) represents what students may physically do during this phase in order to "complete" that phase. The outer box represents thought processes that students may go through as they are working in that phase.

The second page is a collection of ideas for scaffolds or protocols to support students to develop the thought processes.

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Scaffold	Description	Thinking connection	Phase
Question Formulation Technique (Right Question Institute)	Brainstorm questions Open vs closed Reword some questions Prioritize questions	Helps students form questions to tap into curiosity and start inquiry Helps students focus research	Understand the Problem (Ask)
Text-based Opinion Posters (http://bit.ly/12jWllB)	Search text for answers to questions or connections to their problem. Highlight text, and write connection on poser Done in group to encourage collaborative thought	Supports purposeful research and connecting information to problem	Understand the Problem (Ask)
5 Whys (School Reform Initiative)	Start with a problem Ask, "Why," and list reasons Repeat up to 5 times	Deepens understanding of a problem Helps uncover layers to a problem	Understand the Problem (Ask)
Step Ladder Brainstorming (Mind Tools)	In groups of 4 – 10 2-3 people start brainstorming verbally while writing ideas down After 2-3 minutes, add in 1-3 more people Continue adding until all have joined	Allows students to think about ideas while watch and listening others As people are added, the thinking is pushed deeper	Imagine
Concept Mapping	Brainstorm ideas while connecting them to each other	Allows students to see connections between ideas and expand upon ideas Starts to provide focus	Imagine; Plan
Story Board	Layout in a series of sketches how something will be built or created	Helps a student to strategize and visualize how they will create	Plan
Design Workshops	Hold mini workshops on skills students need to complete a design	Focuses on a small number of students to support them learning a specific skill	Create
Design Charrette (School Reform Initiative)	Designer relinquishes a design in progress to a group Group takes on the design and brainstorm ways to implement or improve Designer listens until they have what they need to continue	Helps students push past being "stuck" Improves a design mid-way through creation	Create; Improve; Understand a Problem (ask)
Reverse Engineering	Take a completed design apart Examine each part	Helps students purposefully analyze a design to understand how it fits together	Improve; Understand the Problem (ask)
6 Thinking Hats (Edward de Bono)	Specific types of feedback is connected to a color.	Gives students a framework for how to give feedback and the purpose behind feedback	Throughout the design process