



Framing and Reframing Design Problems

Week 2: First Lecture

Designers don't just solve problems – they shape them

Product Design

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**DESIGN
EXPLORATION
RESEARCH
GROUP**

Outline

- **Business**
- **Opening**
- **Grand Rounds/Design Tools**
- **Sketching**
- **Closing**

Readings/Dialogue:

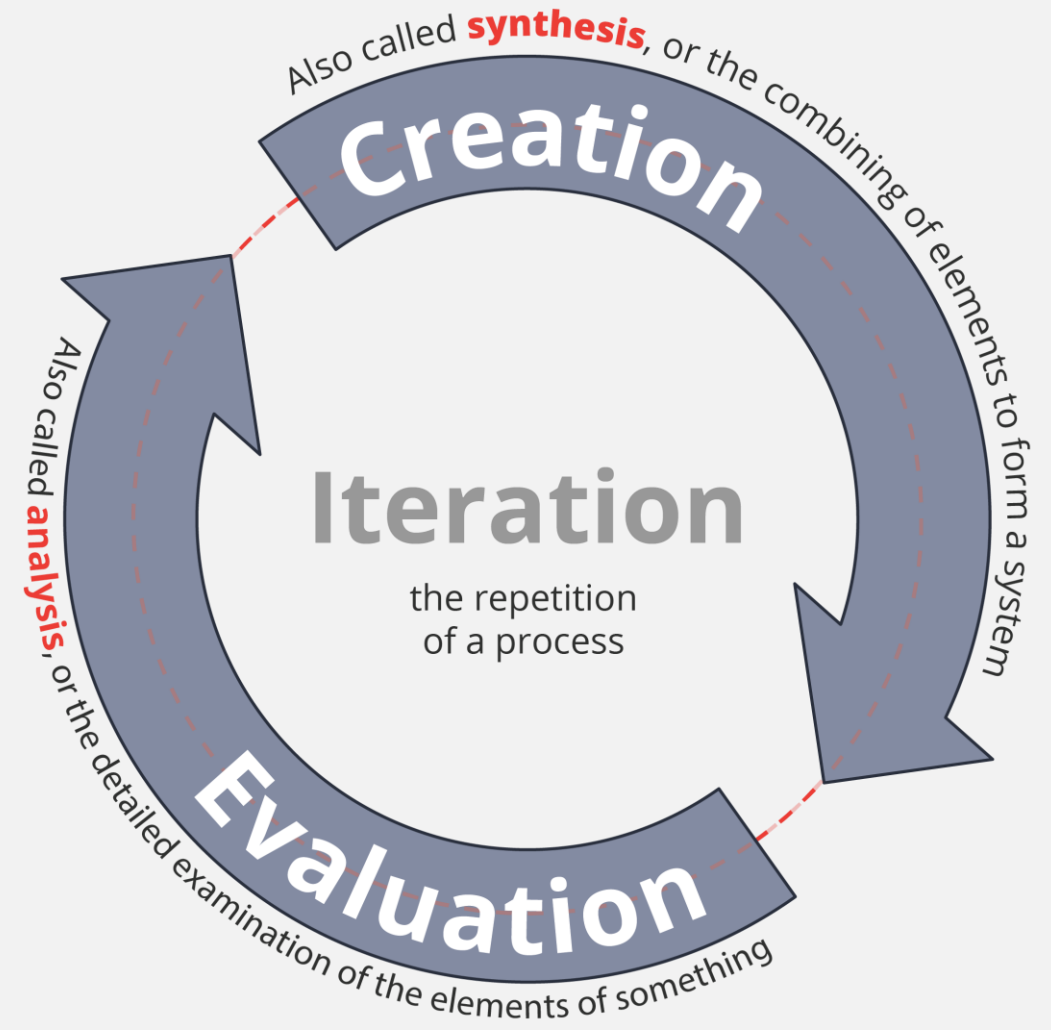
How are the readings influencing your personal design philosophy?

What are you learning from your peers, in the dialogue?

What has been your approach to engage in the readings?

How have you applied the reading to your design projects?

In what ways can you get **deeper** in your application?



Decomposition

Recombination (Table)

Most Critical Module/Interface

Geometry-Material-Process Decisions

Observations (+Thoughtless Acts)

Nucor's Circle (Hedgehog Concept)

5W Problem Framing

Double Diamond

Opening

Elder Anderson – Settling and Me En 576

UPDATED WITH A NEW INTRODUCTION, AUTHOR Q&A,
AND A FOREWORD BY ARIANNA HUFFINGTON

"*The Go-Giver* is the most important parable about business—and life—of our time."
—ADAM GRANT, *New York Times* bestselling author of *Give and Take*

OVER
ONE MILLION
COPIES SOLD
GLOBALLY

The GO-GIVER



A LITTLE STORY ABOUT A
POWERFUL BUSINESS IDEA

Bob Burg *and* John David Mann

The Law of Value

Your true worth is determined by how much more you give in value than you take in payment.

The Law of Compensation

Your income is determined by how many people you serve and how well you serve them.

The Law of Influence

Your influence is determined by how abundantly you place other people's interests first.

Law of Authenticity

The most valuable gift you have to offer is yourself.

Law of Receptivity

The key to effective giving is to stay open to receiving.

Grand Rounds

A Case Study Discussion

Design Brief | Draper Torque Wrench (Click Type) Accuracy

In 2024, a driver in the UK reported that a wheel came loose on a Fiat 500 after tightening the lug nuts with a Draper ½-inch click-type torque wrench. The wrench appeared to click normally at 65 Nm, but later testing against a calibrated tool showed it was under-torquing by a wide margin. This “false click” left the fasteners insufficiently tightened, causing the wheel to loosen during use.



Draper ½-inch click-type torque wrench

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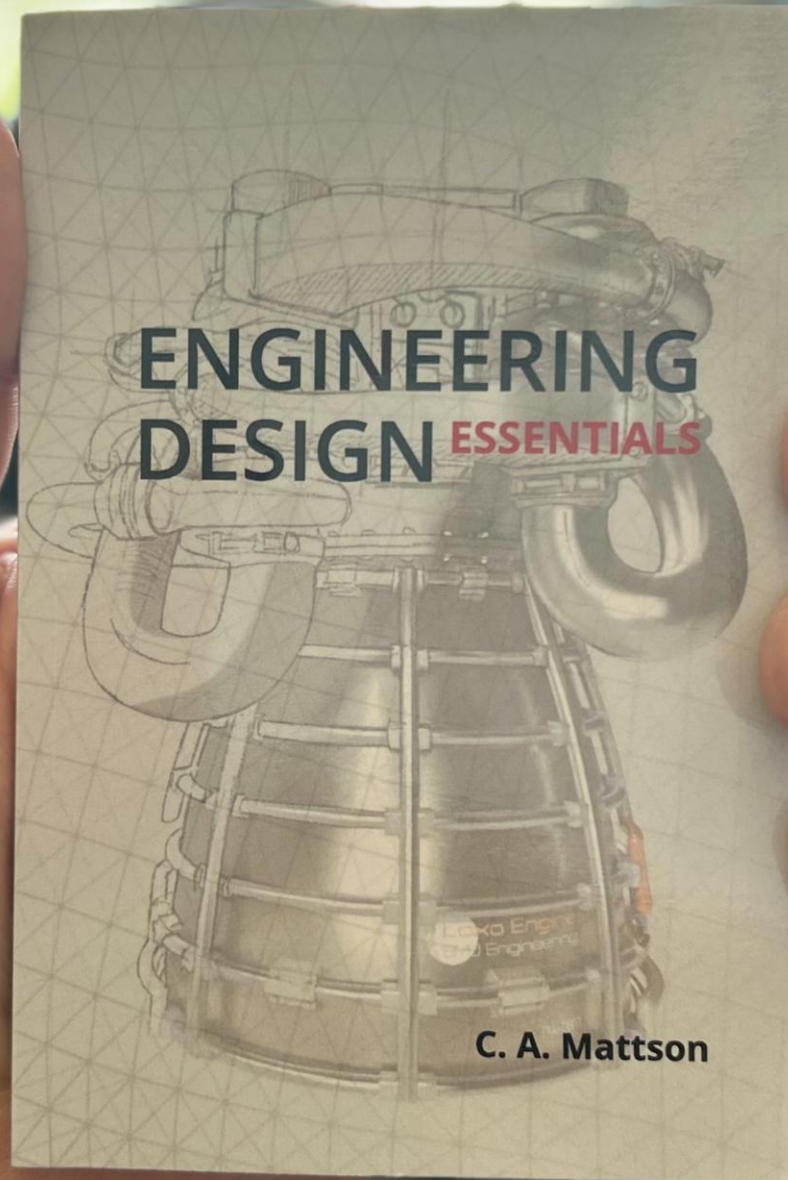
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What is the problem?



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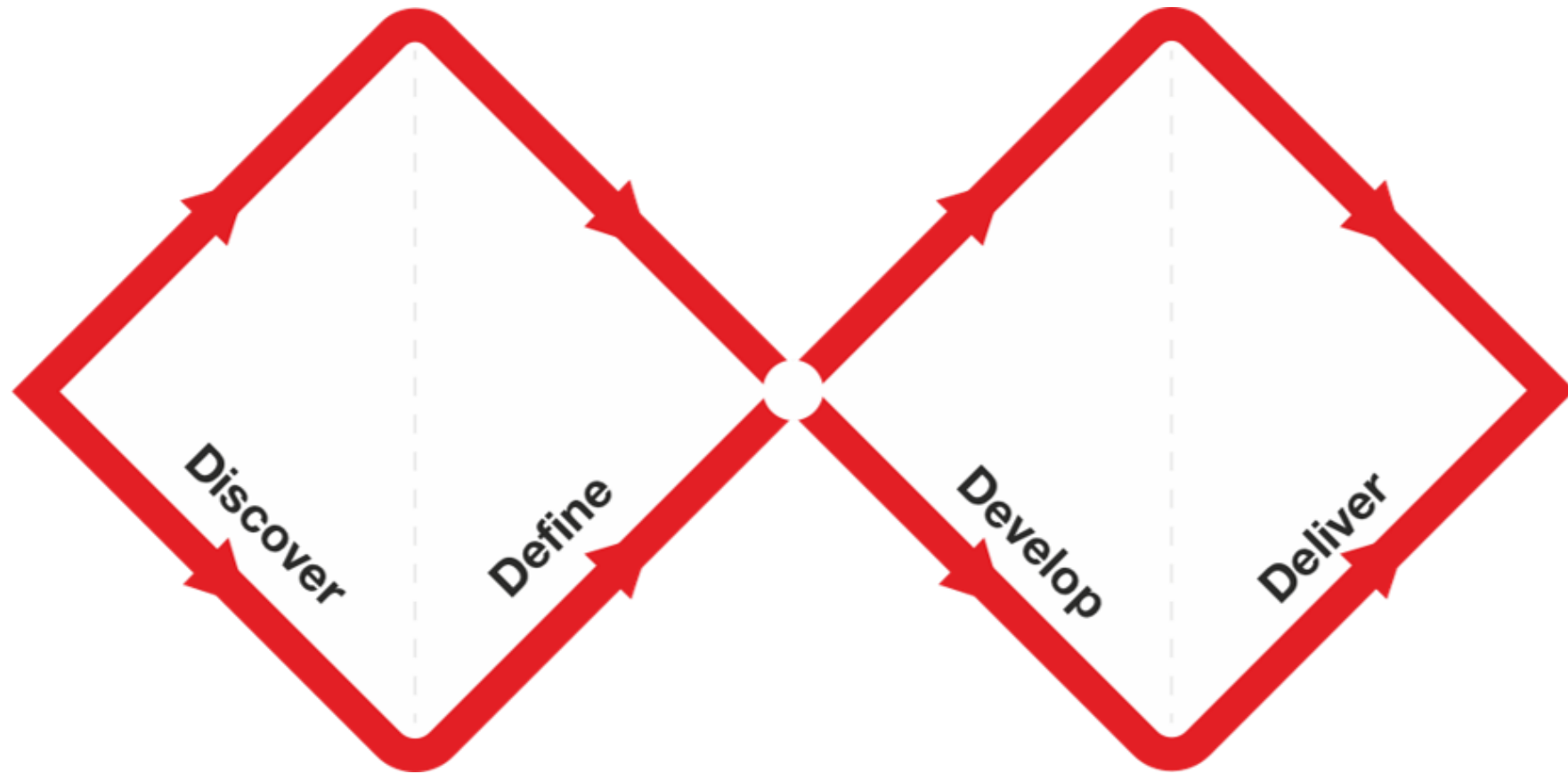
● Go to Page 90 (90-91)



Double Diamond

It's not an instruction manual on how to design, it's an invitation to get involved.

– Tim Brown, IDEO



DISCOVER

The first diamond helps people understand, rather than simply assume, what the problem is. It involves speaking to and spending time with people who are affected by the issues.

DEFINE

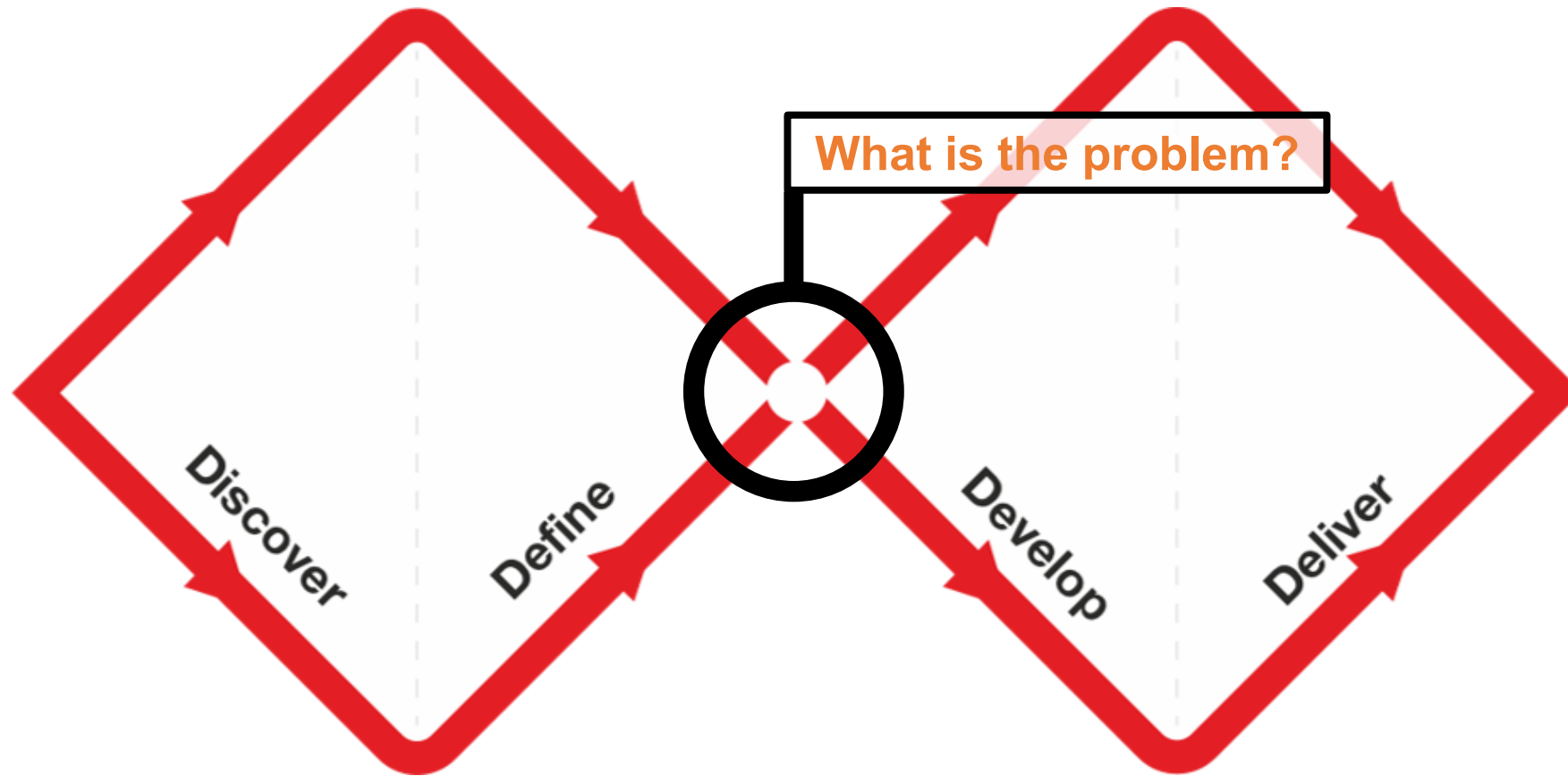
The insight gathered from the discovery phase can help you to define the challenge in a different way.

DEVELOP

The second diamond encourages people to give different answers to the clearly defined problem, seeking inspiration from elsewhere and co-designing with a range of different people.

DELIVER

Delivery involves testing out different solutions at small-scale, rejecting those that will not work and improving the ones that will.



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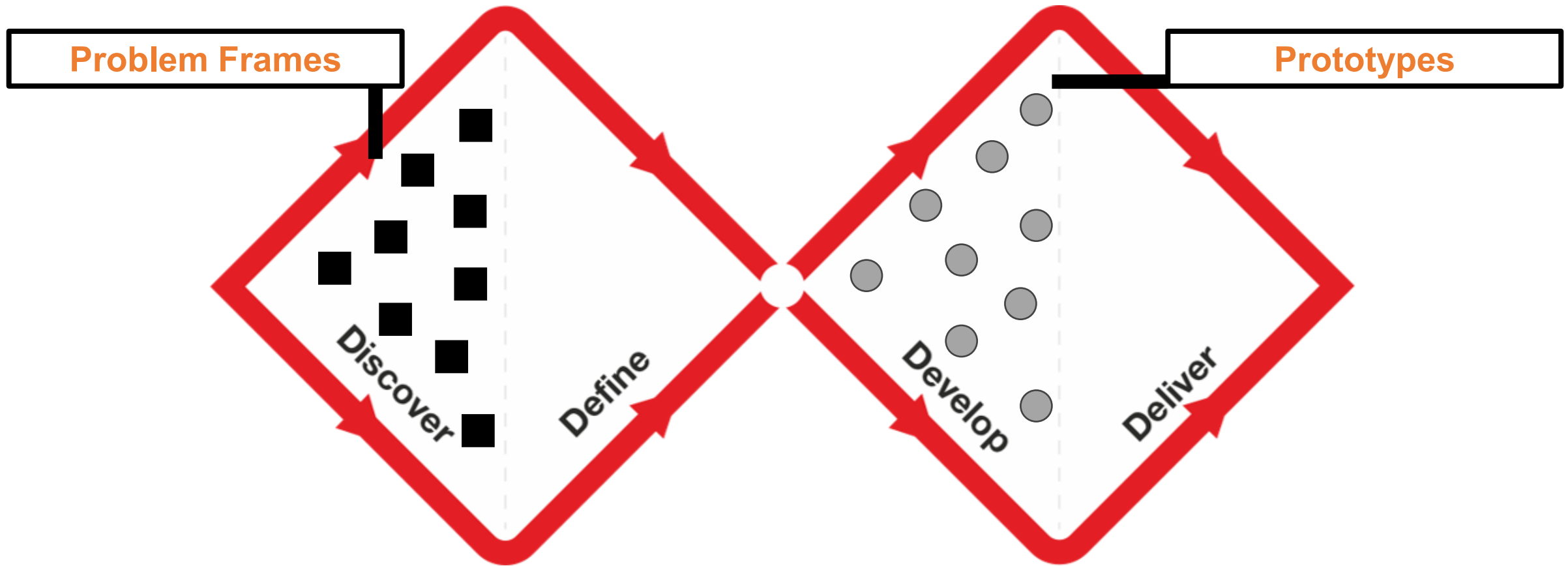
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Who is affected by this issue?



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What is the problem?

Who is affected by this issue?

What are we asking them to do?



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Designette (10 minutes)

Subject: Park Tool Torque Wrench (Click Type)

Purpose: To practice framing

Tasks:

1. Choose a new partner (get to know someone new).
2. Watch the video
3. Look for and **write down** everything ParkTool is expecting its wrench users to do
4. Discuss in group
5. Video: <https://youtu.be/nc6fqfF5T2A?si=rSE7psvT03bfyw0c>

MCM

Most Critical Module

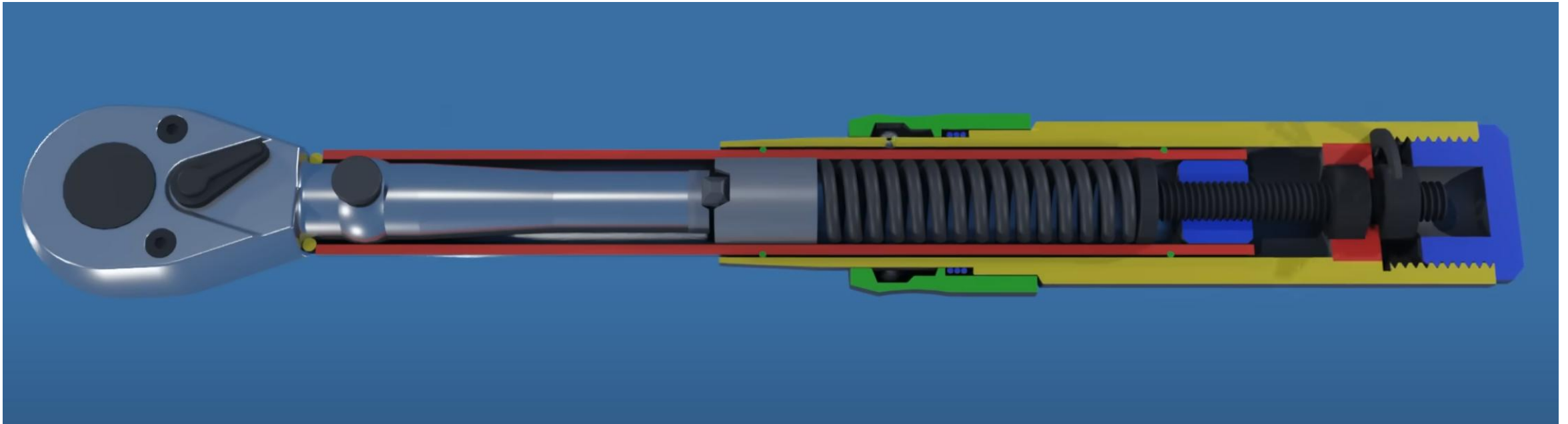


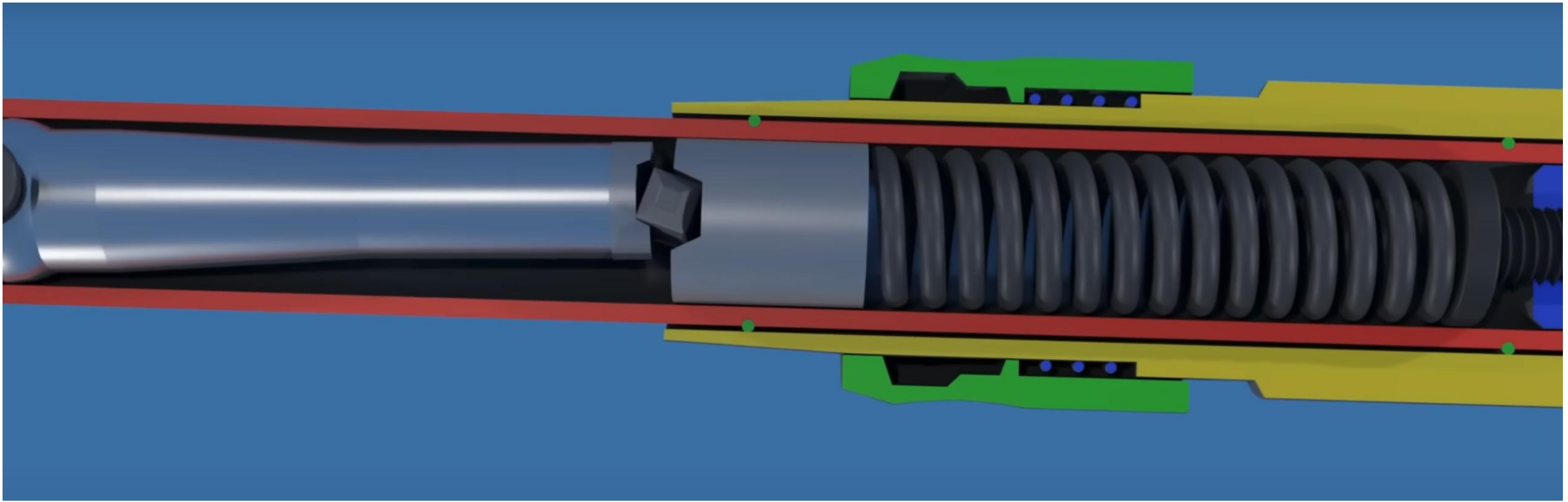
MCI

Most Critical Interface

What is the most critical module(s)?
What is the most critical interface(s)?

Create an engineering sketch (2D) of the problem.





5W Problem Framing

5W Problem Framing Framework (Canvas)

	Problem Frame: Write/Take Notes	Problem Frame: Prevent loose debris
1	Who is facing the problem?	Crew (Astronaut)
2	What is the problem they are facing right now?	Need to write something down, but traditional ball point pen won't work in space.
3	Where does this problem happen?	In space, 0 g
4	When does this problem arise?	When the astronaut needs to write something down
5	Why is this problem worth solving?	Writing things down is important
	Reasonable Solution	Pencil
		Space Pen



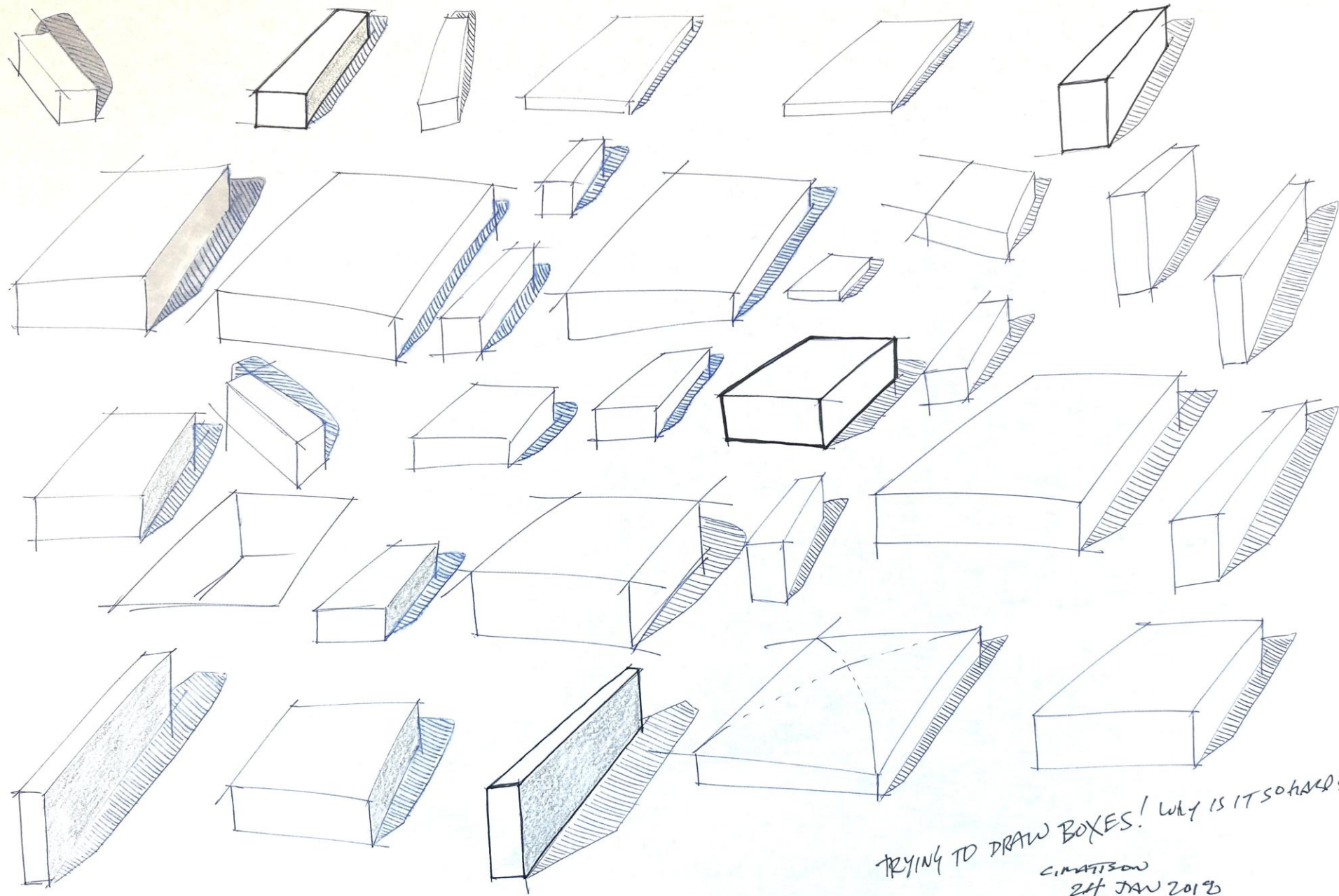
Fischer Space Pen, 1967

5W Problem Framing Framework (Canvas)

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1	Who is facing the problem?	Crew (Astronaut)	Crew and Spacecraft	
2	What is the problem they are facing right now?	Need to write something down, but traditional ball point pen won't work in space.	Broken pencil led floats away in the craft becoming a hazard to the crew and the equipment.	
3	Where does this problem happen?	In space, 0 g	In space, 0 g	
4	When does this problem arise?	When the astronaut needs to write something down	When led from a pencil breaks and floats away	
5	Why is this problem worth solving?	Writing things down is important	Broken pencil led produces a uncertain and dangerous environment (since lead is conductive, combustible, and potentially ingested).	
	Reasonable Solution	Pencil	Space Pen	

Sketching

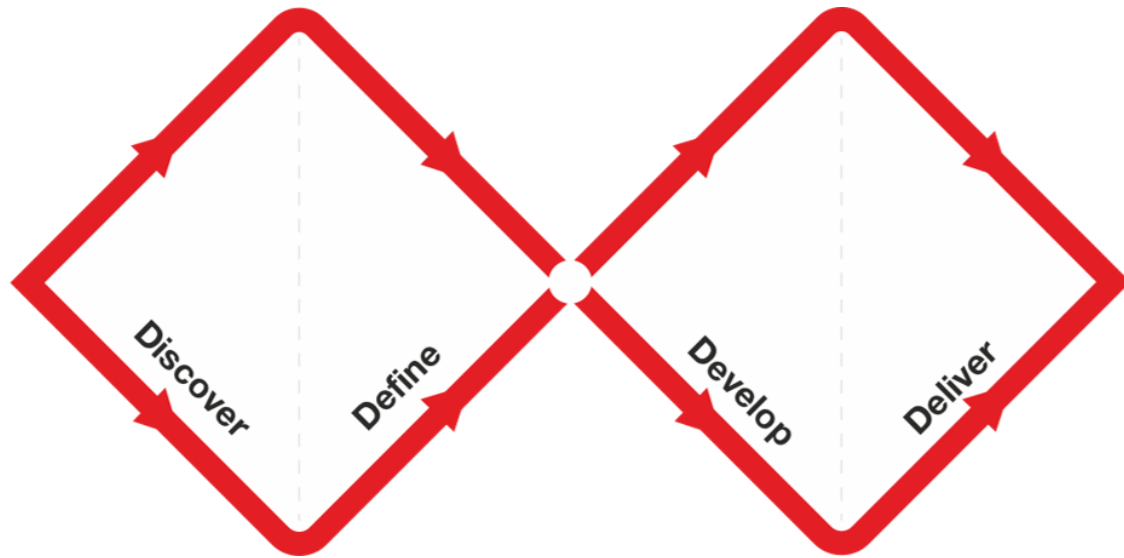
Sketch a page full of isometric cuboids



TRYING TO DRAW BOXES! WHY IS IT SO HARD??
C. MATISON
24 JAN 2018

Closing

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What to do now

- Use the Study Guide
- Do the designette (more torque wrenches)
 - Work on the Project