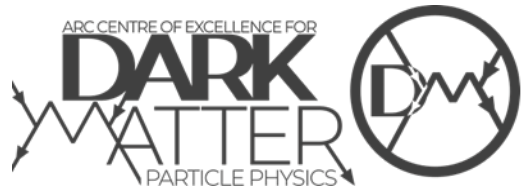


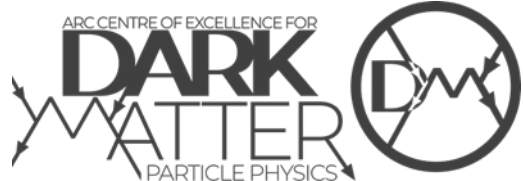
Increasing impact of science

Applied Innovation Lab

Professor Christine Thong



Applied Innovation Lab =
design experimentation to
increase the impact of science
(particularly societal impact)



Applied Innovation Lab =
design experimentation to
increase the impact of science

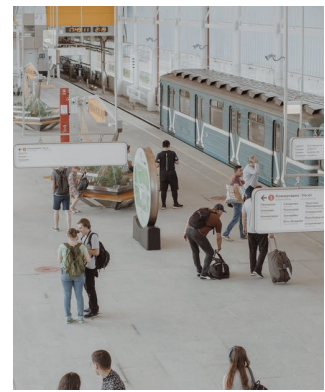
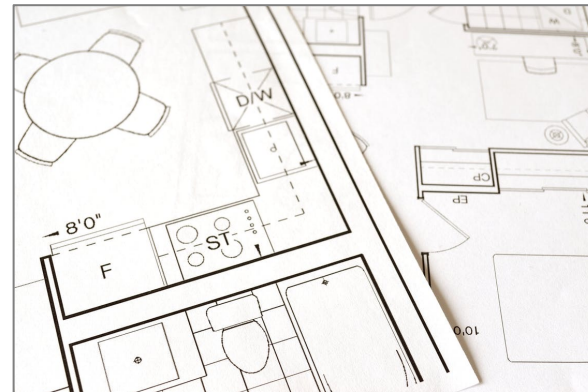
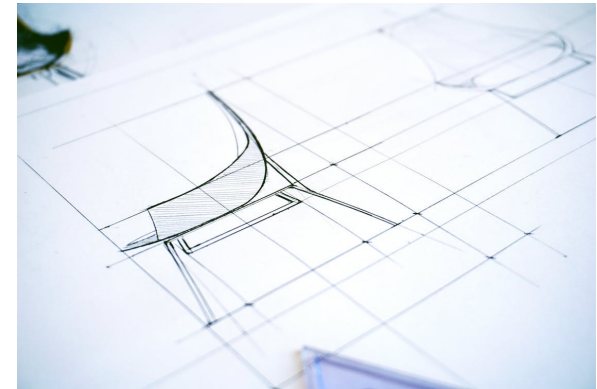
(particularly societal impact)



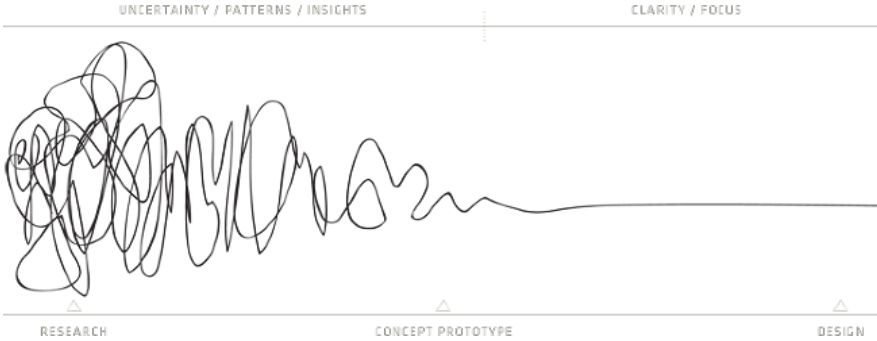
What is design?

Discipline fields include:

- Industrial design
- Service design
- Interior architecture
- Architecture
- Communication design
- Textile design
- User experience design
- Digital media design
- Design Thinking



Design models



INSPIRATION

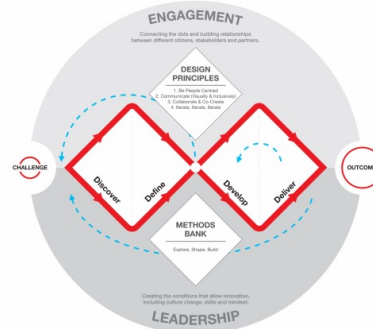
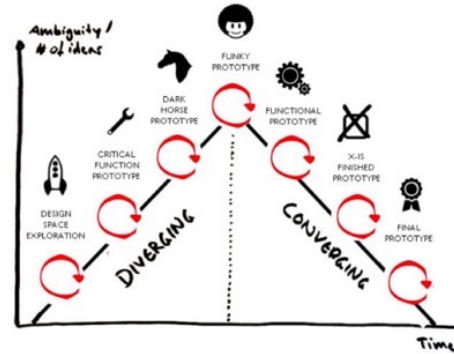
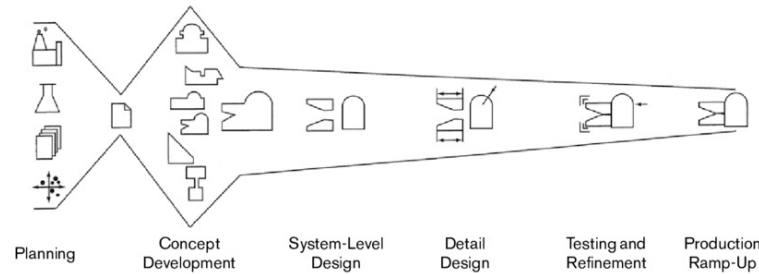
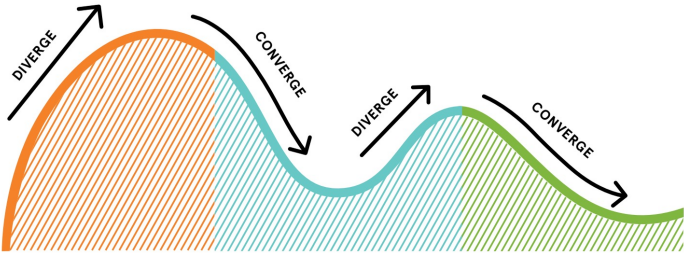
I have a design challenge.
How do I get started?
How do I conduct an interview?
How do I stay human-centered?

IDEATION

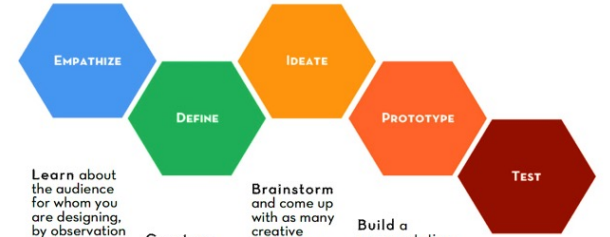
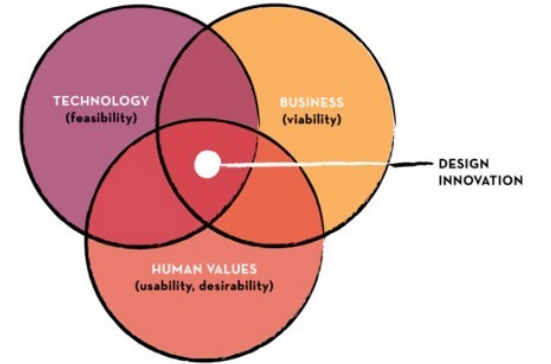
I have an opportunity for design.
How do I interpret what I've learned?
How do I turn my insights into tangible ideas?
How do I make a prototype?

IMPLEMENTATION

I have an innovative solution.
How do I make my concept real?
How do I assess if it's working?
How do I plan for sustainability?



© Design Council 2019



Learn about the audience for whom you are designing, by observation and interview.
Who is my user? What matters to this person?

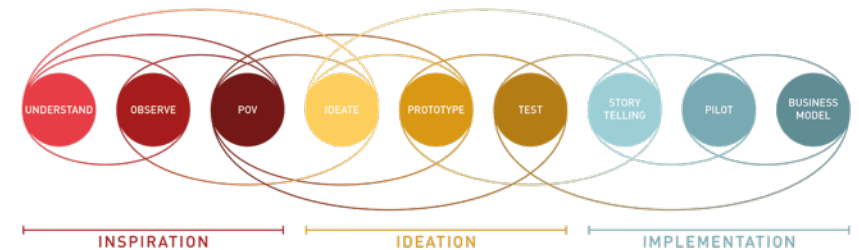
Create a point of view that is based on user needs and insights.
What are their needs?

Brainstorm and come up with as many creative solutions as possible.
Wild ideas encouraged!

Build a representation of one or more of your ideas to show to others.
How can I show my idea? Remember: A prototype is just a rough draft!

Share your prototyped idea with your original user for feedback.
What worked? What didn't?

THE DESIGN THINKING PROCESS



Human-centred design



Embrace

- Incubator for babies
- Affordable ~\$25 USD,
- Developed by students at Stanford University

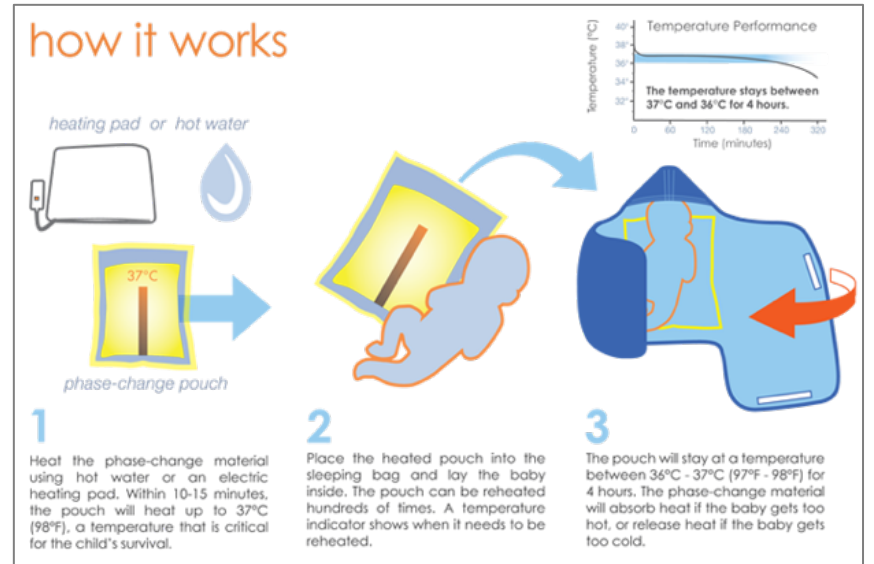


Image sources:

<http://cargocollective.com/futurehealth/Embrace-Infant-Warmer>

<https://www.fastcompany.com/1685394/embrace-infant-warmer-gets-its-first-test-baby>

<https://heymama.co/embrace-innovations-jane-chen/>

Human-centred design



> Cardboard Prototype



> Plywood Prototype



> Semi-resolved



> Proof of Concept



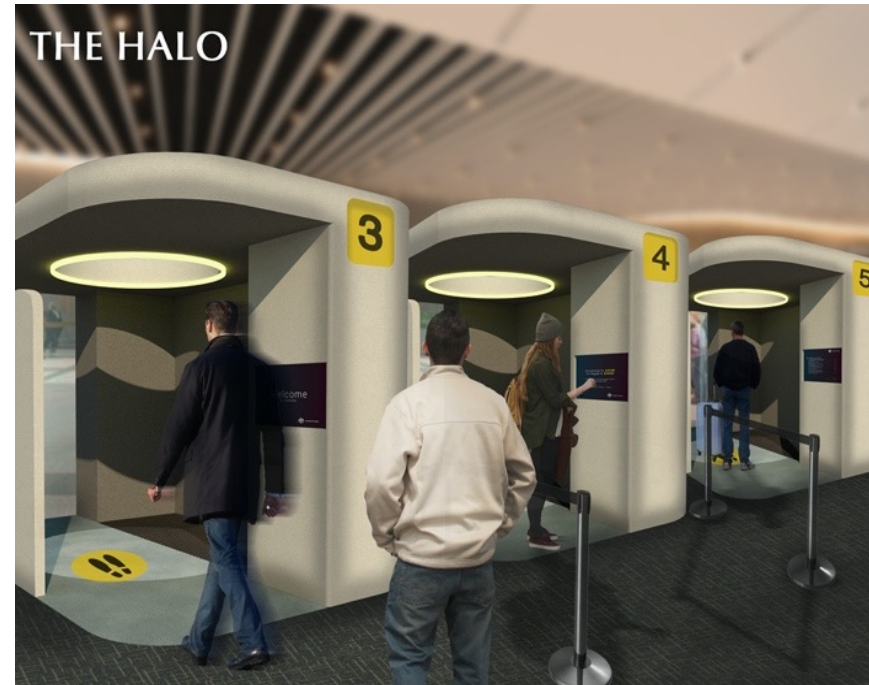
Why design + dark matter particle physics?



Medipix technology

Read-out chip for particle imaging and detecting

(+ other technologies)

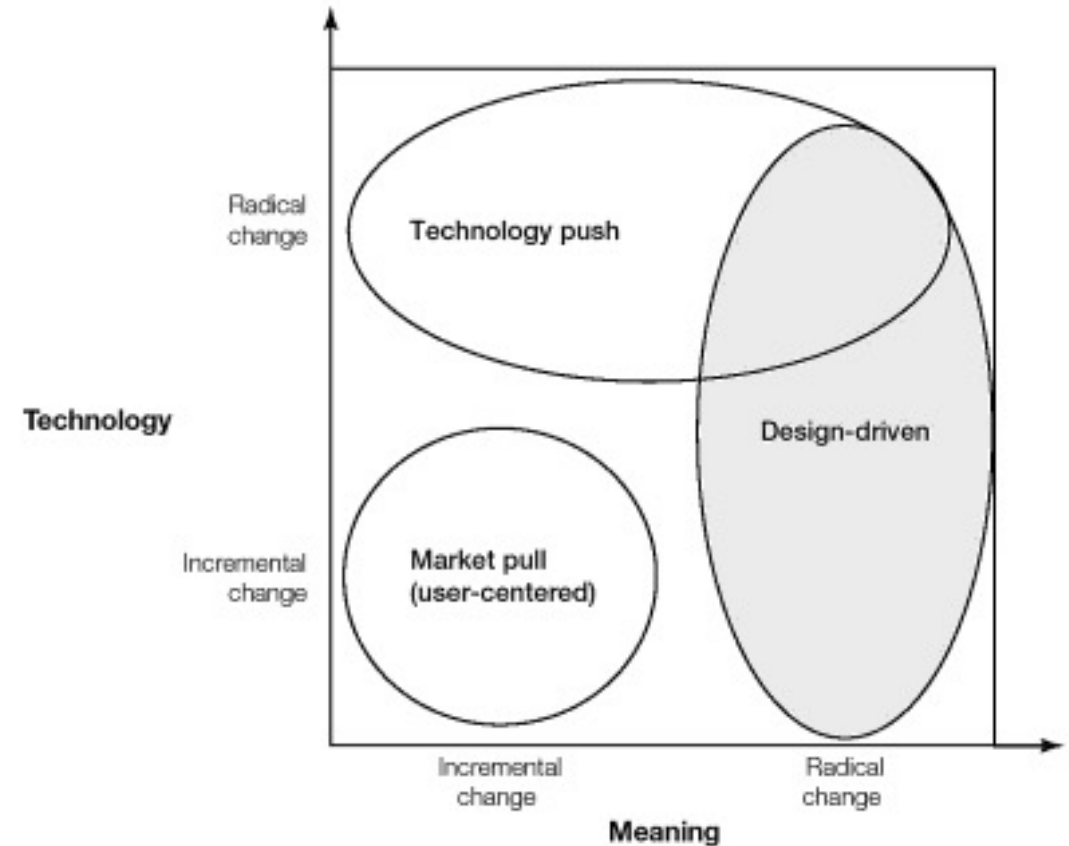


Airport scanning system for illicit and/or biohazardous substances

Technology + Design

= Transformative
innovation

The strategy of design-driven innovation as the radical change
of meanings



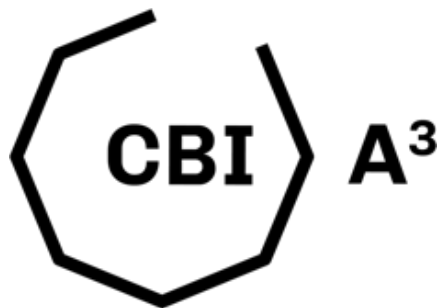
(Verganti, 2009)



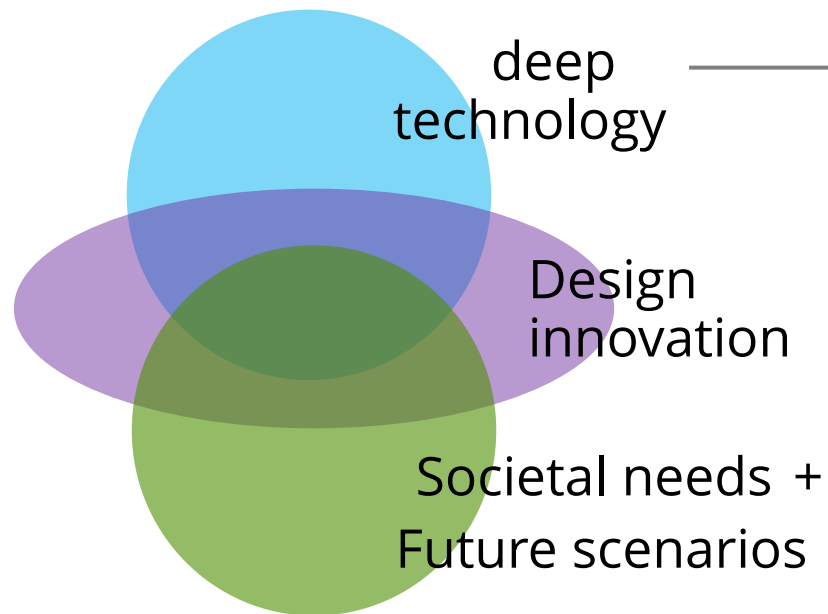
KUKA







Challenge Based Innovation Program



IdeaS



SUSTAINABLE DEVELOPMENT GOALS

2030



Difficult due to a range of factors

- **Methods:** Design process typically first explore human needs
- **Knowledge Transfer:** Understanding of technical concepts by business and design disciplines
- **Responsibility:** Should scientist have the responsibility to develop societal applications based on their research?
- **Industry challenge:** You don't know what you don't know! Limited by knowledge of different industry sectors and future challenges

Ideally.....

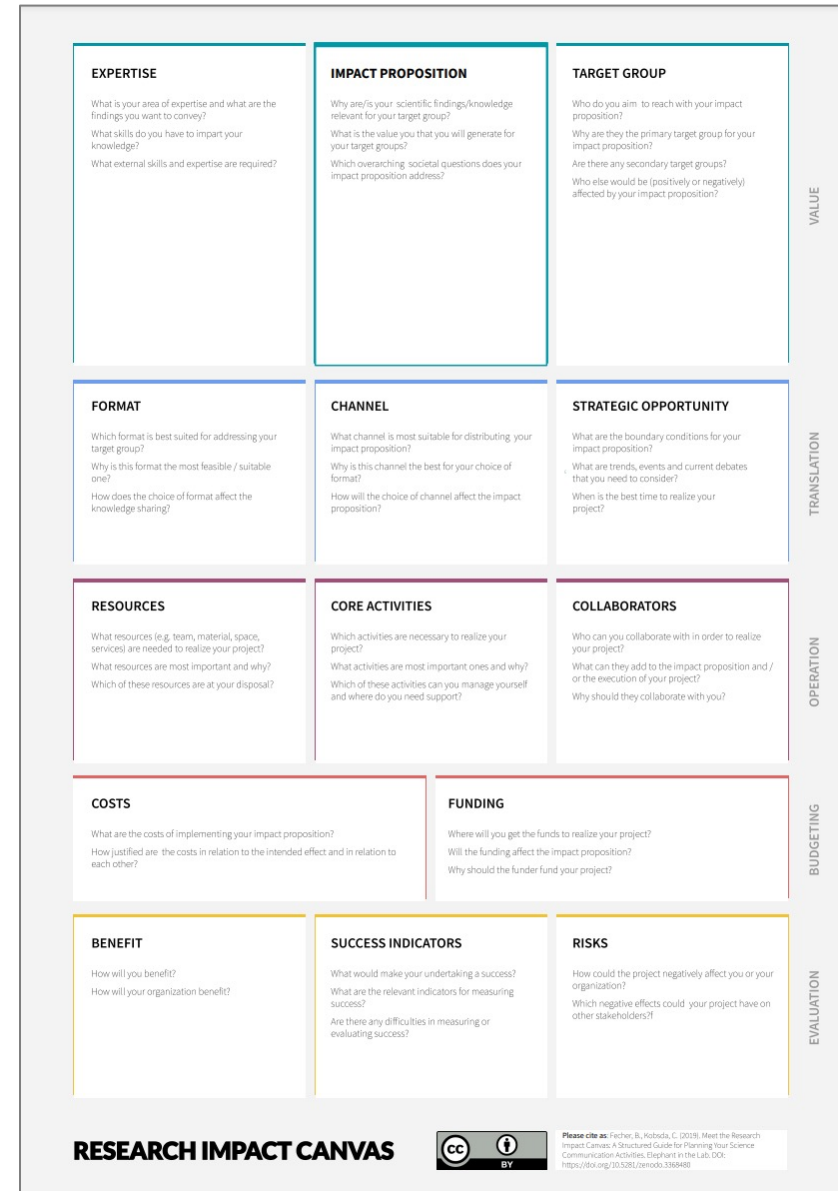


Increasing impact of science

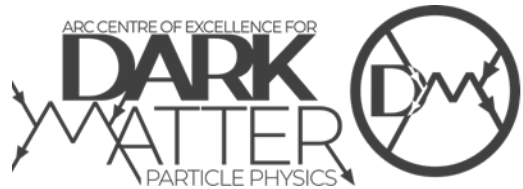
Research impact canvases



https://www.tuni.fi/sites/default/files/media/file/impactcanvas_tampereuni_fillable_0.pdf



<https://elephantinthelab.org/meet-the-research-impact-canvas-a-structured-guide-for-planning-your-science-communication-activities/>



Research impact canvases

Name: _____ Date: _____ Revision: _____

(1) Research Topic
Describe your research in a short and concise manner.

(2) Research Problem
Describe what research problem(s) you are trying to solve.

(3) Research Solution
Describe your solution(s) to the problem(s) in (2).

(4) Research Grants
List all research grants (past and present) that have paid for your research.

(5) Intellectual Assets (IA)
List the most important IA (computer program, methods, processes, patentable inventions, designs, know-how, test material, tests, etc.) that you have in your research project.

(6) Ownership?
Name the respective owner (you, a group of people, a company, etc.) of each intellectual asset in (5).
Intellectual Asset: _____ Owner?: _____

(7) Research Competition
Describe the competing solution(s) to your solution(s) in (3) and name the provider(s) of the competing solution(s).

(8) Stakeholder
List your most important stakeholders?
Stakeholder: _____ Stakeholder: _____ Stakeholder: _____ Stakeholder: _____ Stakeholder: _____ Stakeholder: _____

(9) Prepare a 2 min pitch!
Choose one of your stakeholders from (8) and prepare a 2 min pitch according to instructions on the back!

(10) To-Do list
Describe how you are going to make impact with your research in the near future or in the next couple of years. Write down concrete goals!

The Research Impact Canvas®
Frederik Edman, Lund University

2 min pitch

Stakeholder: _____

Hook H → **Need** N → **Approach** A

Benefit B → **Competition** C → **Close** C

Pitch Feedback
Write down the received feedback in this box for future revision of the canvas.

Pitch & Feedback Instructions
Prepare a 2 min pitch for one of the stakeholders in (8) according to the six boxes H-N-A-B-C-C below. Inspiration for the Hook, Need, Approach, Benefit, Competition and Close can be found in the boxes (1)-(8) on the other side. After the pitch each listener will provide feedback.

The rules for giving feedback on the pitch is as follows:

- Each person should at least give one possible feedback and one suggestion for improvement. Only constructive and positive feedback is allowed.
- You, the receiver of the feedback, is only aloud to listen (no defense).
- You, or a person in the group, should take notes of the feedback and write it down in the Pitch Feedback box.

Improve and revise your pitch based on the feedback!

The Research Impact Canvas®
Frederik Edman, Lund University

https://www.au.dk/fileadmin/user_upload/Awareness_THE_RESEARCH_IMPACT_CANVAS.pdf

<p>STEP 1 complete this row</p> <p><i>freewrite, bullet point, capture what is the essence of your work?</i></p>	<p>What is your research?</p> <p><i>Consider key words.</i></p>	<p>Why is this important? Who else will find this important? (not your parents!)</p>	<p>What intellectual assets are involved? <i>Consider knowledge, process, equipment, facilities, processes and technology.</i></p> <p><i>Select one asset and</i></p>	<p>How does this work? <i>Do this for the one selected asset Are there any comparisons or analogies?</i></p>
	<p>STEP 2 complete this row</p> <p>Distill into 1 sentence:</p>	<p>Distill into 1 sentence:</p>	<p>Distill into 1 sentence:</p>	<p>Distill into 1 sentence:</p>

Now, what if you had to explain this to a... _____

<p>STEP 3 complete this row</p> <p>Revise sentence:</p>	<p>Revise sentence:</p>	<p>Revise sentence:</p>	<p>Revise sentence:</p>
--	-------------------------	-------------------------	-------------------------

Choose 1 of the following:

- 10 year old
- Nurse
- Olympic swimmer
- Chef
- Football player
- Gardener
- Pilot
- Yoga teacher



Now, what if you had to explain this to a... _____

STEP 3
*complete
this row*

Revise sentence:	Revise sentence:	Revise sentence:	Revise sentence:
------------------	------------------	------------------	------------------

Sharing

- 1 sentence on what they do + 1 sentence why it's important and who will care
- 1 sentence on a intellectual asses + how it works (analogy?)
- Any other comments

Please share your work and feedback!

- Upload a photo of your template (please add name)
- 5 short questions for feedback



<https://christhong.typeform.com/to/uf8cQOSD>