

The Global Centre for Climate Action
BMO Climate Action Speaker Series



Circularity by Design

Generously supported by:



Background photo supplied by IKEA

Land Acknowledgement



OCAD University acknowledges the ancestral territories of the Mississaugas of the Credit, the Haudenosaunee, the Anishnaabeg and the Huron-Wendat, who are the original owners and custodians of the land on which we live, work, and create.



Rebecca Wakefield

Student, Industrial Design
OCAD University

Rebecca Wakefield is Industrial Design student at OCAD University and researcher at the DESIGNwith Lab, exploring biomaterials and circular design. Her research is focused on using cellulose to make sustainable plastic alternatives and the alignment of material longevity to its use.

Socials: rwdesign.ca , [@reallyfundesign](https://www.instagram.com/reallyfundesign)



Ranee Lee

**Associate Professor, Industrial Design
OCAD University**

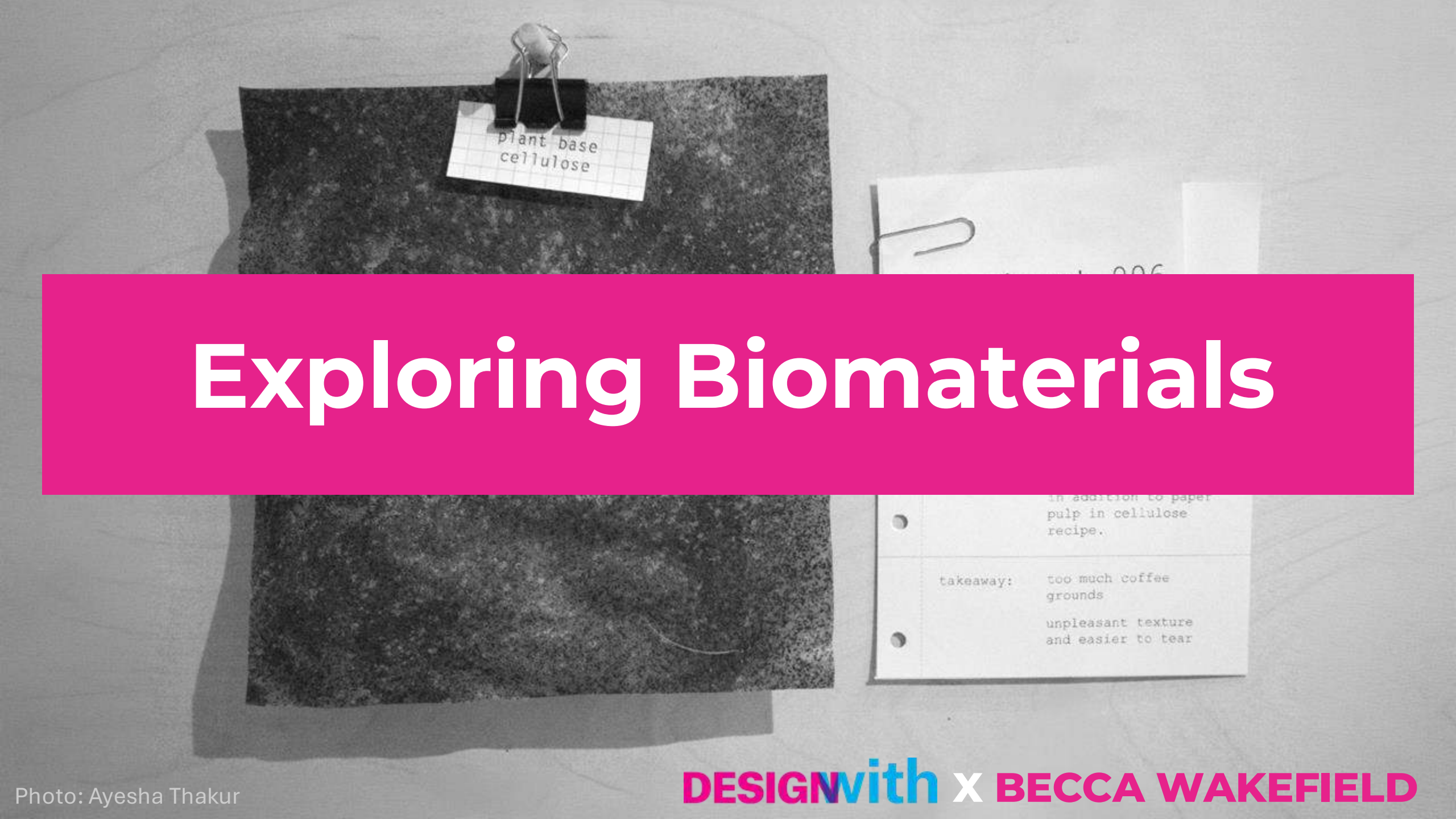
Ranee Lee is an industrial designer and Associate Professor at OCAD University. She is the founder of DESIGNwith, an innovation lab focused on the circular economy and social innovation. She holds an MA in Participatory Design from the University of Toronto and is engaged in ongoing research on alternative economies in marginalized communities. Her work also focuses on care and culture projects aimed at advancing the concept of Form Follows Care. Most recently, she was awarded the Faculty Mobility for Partnership Building Program grant by the Canadian federal government, which took her to São Paulo, Brazil, for a short-term research project on biomaterials.



Peter Jones

Head of Sustainability IKEA Canada

Peter Jones is the new Head of Sustainability at IKEA Canada, bringing deep experience from a range of roles across the IKEA organization in the UK, Canada, and Sweden. He has led key initiatives including developing new omnichannel performance measurements and serving as Head of Pricing for Ingka Group, where he helped safeguard affordability for customers globally. In 2018, Peter became Head of Sustainability Analytics & Impact, leading work to measure Ingka's sustainability performance and embed sustainability into everyday decision-making. He brings values-driven leadership and proven expertise as IKEA Canada advances its sustainability strategy to create a better everyday life for the many.



Exploring Biomaterials

Thank You!



Professor Ranee Lee
Champion of sustainable
innovation and uplifting students.



Hannah Cormier, Sheridan College.
Bacterial Cellulose Research



Beatriz Tiemi, Centro Universitário
Belas Artes de São Paulo.
Biomaterials Researcher

How might we...

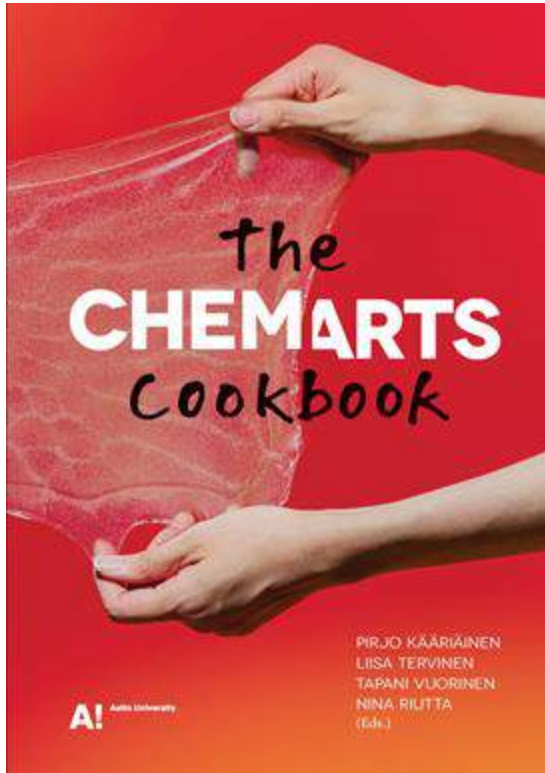
develop a biomaterial that is

strong, flexible and

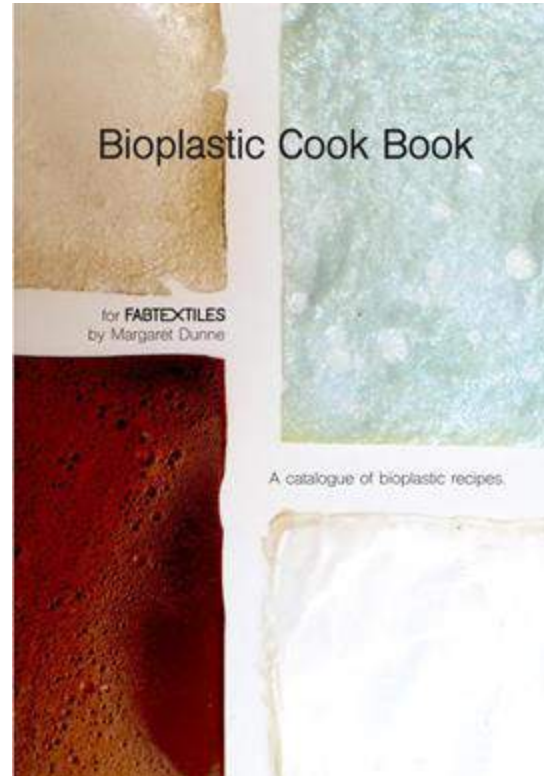
water resistant

**in order to replace unsustainably sourced and non
biodegradable materials.**

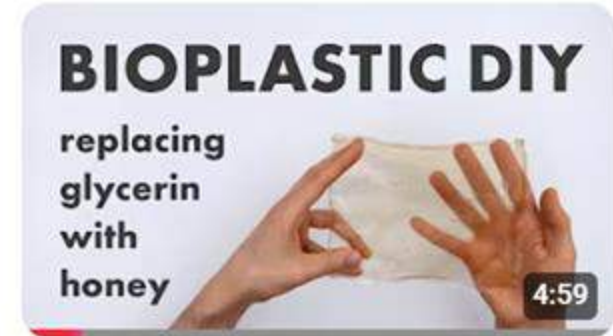
A lot of cool research in this area...



The Chemarts Cookbook, Aalto University, 2020. Pirjo Kääriäinen, Liisa Tervinen, Tapani Vuorinen, Nina Riutta



Bioplastic Cook Book. FABTEXTILES, 2018. Margret Dunne.



Homemade Bioplastic : replacing glycerin with honey

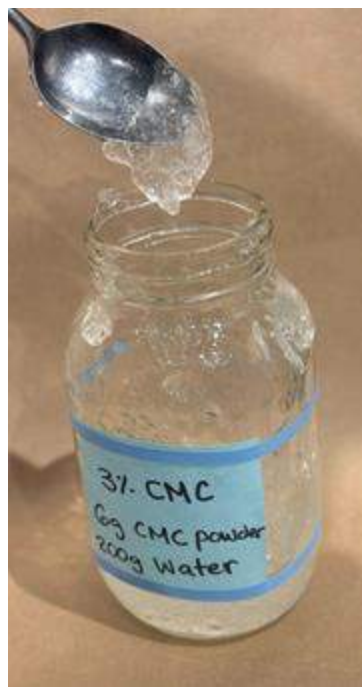
16K views • 4 years ago



Homemade Bioplastic: agar vs. gelatin

24K views • 3 years ago

Youtube video series by Giestas.
<https://www.youtube.com/@giestas>



Understanding the ingredients



Cellulose (CMC)



Agar Agar



Glycerine



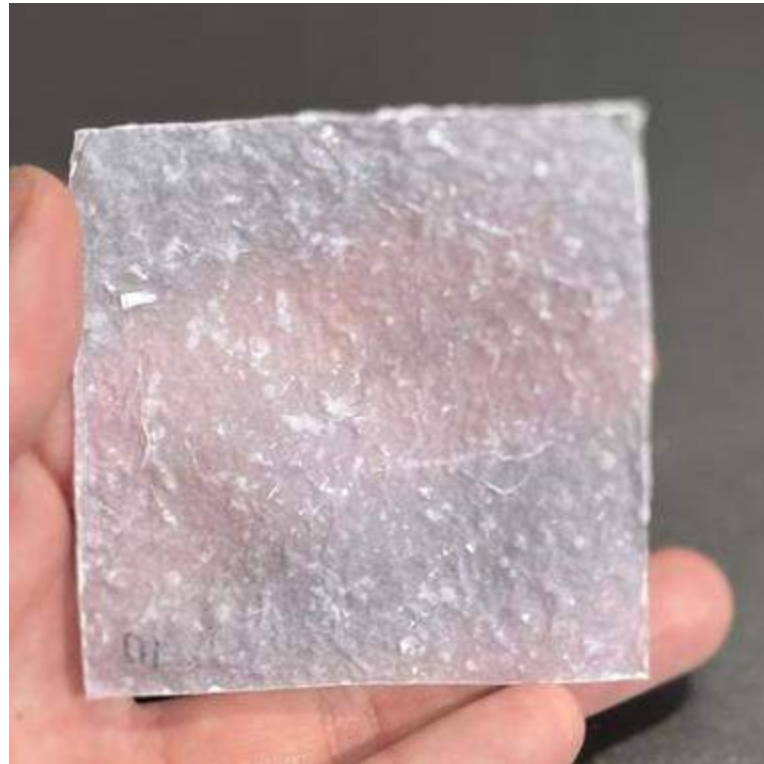
Starch



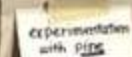
Substrate

all available at grocery or baking store.

Experiments



EXPERIMENTS



You can make it too!

Ingredients (in grams) for one baking sheet of biomaterial:

16g	Paper pulp	400g	Water
20g	Corn Starch	8g	Agar Agar
30g	Glycerine		
9g	CMC Powder (Carboxymethyl Cellulose)		

Process

1. In a blender, mix together the all the ingredients. Blend until smooth.
2. Pour mixture into a cooking pot and cook on a stove top until it begins to thicken.
3. Spread out on a nonstick flat surface such as a baking sheet and let dry for up to one week.
4. Once dry, material should easily lift off the baking sheet and not rip or tear when tugged.



Applications



Lamp design and Photo
by Zach Mernard

Brazil



Photo: Lali Barros

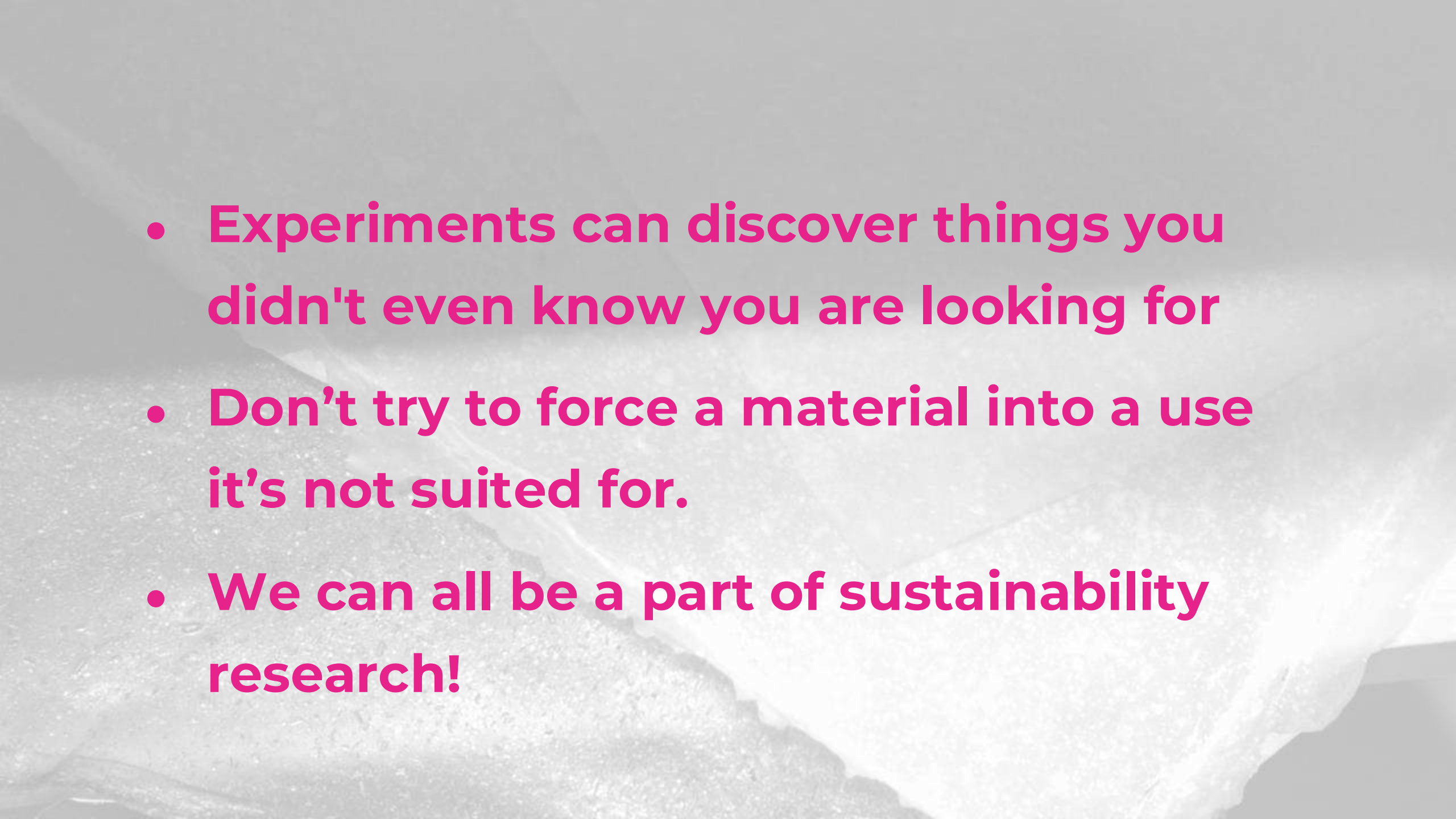


Photo: Vitoria Dalla Val

But wait...





- 
- Experiments can discover things you didn't even know you are looking for
 - Don't try to force a material into a use it's not suited for.
 - We can all be a part of sustainability research!

DESIGNwith cellulose based biomaterials

Ingredients (in grams) for one baking sheet of biomaterial:

16g	Paper pulp	400g	Water
20g	Corn Starch	8g	Agar Agar
30g	Glycerine		
3g	3% (CMC) Carboxymethyl cellulose		

Process

1. In a blender, mix together the all the ingredients. Blend until smooth.
2. Pour mixture into a cooking pot and cook until it begins to thicken.
3. Spread out on a nonstick flat surface such as a baking sheet and let dry for up to one week.
4. Once dry, material should easily lift off the baking sheet and not rip or tear when tugged.



DESIGNwith

DESIGNwith

DESIGNwith
In Partnership with





LIFE

OCAD U gets "Regent Park Proud"

An OCAD U industrial design class has joined with a Regent Park women's sewing collective in a poverty reduction strategy.

By Jonathan Forani Staff Reporter
Fri., June 17, 2016 3 min. read

JOIN THE CONVERSATION



TO PROSPERITY: TORONTO POVERTY REDUCTION STRATEGY



I DREAM OF A TORONTO...

“that looks for every opportunity to help people to get on their feet. A city that actively looks to remove barriers and enhance opportunities.”

“that listens, respects, and reflects the voices of individuals with lived experience of poverty. That values evidence-based decision making. That questions whether decisions will increase or decrease poverty and income inequality.”

- Toronto residents

INDUSTRIAL DESIGN STUDENTS DESIGNING FOR SOCIAL CHANGE

Thursday, November 19, 2015



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  [Learn more toronto.ca](#)

NOW Magazine / Life / Education

Design students team up with the Regent Park Sewing Circle

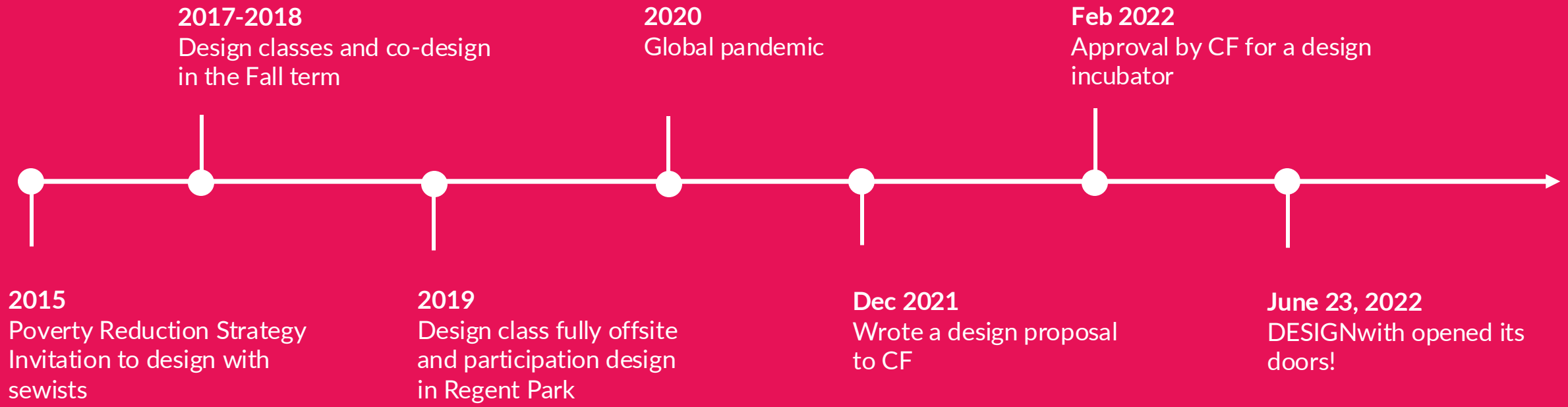
An OCAD University course challenges budding industrial designers to think locally

By Kelly Donohue Jan 18, 2019





OCAD University industrial design student Mads Cogen thought about the entire TTC commuter experience when she collaborated with the Regent Park Sewing Circle on her RECENT Commuter bag. With the name of the neighbourhood emblazoned across the white and red vinyl flap concealing a Presto card, keys and credit cards, the soft-touch design aims to make subway experiences easier – and more stylish.



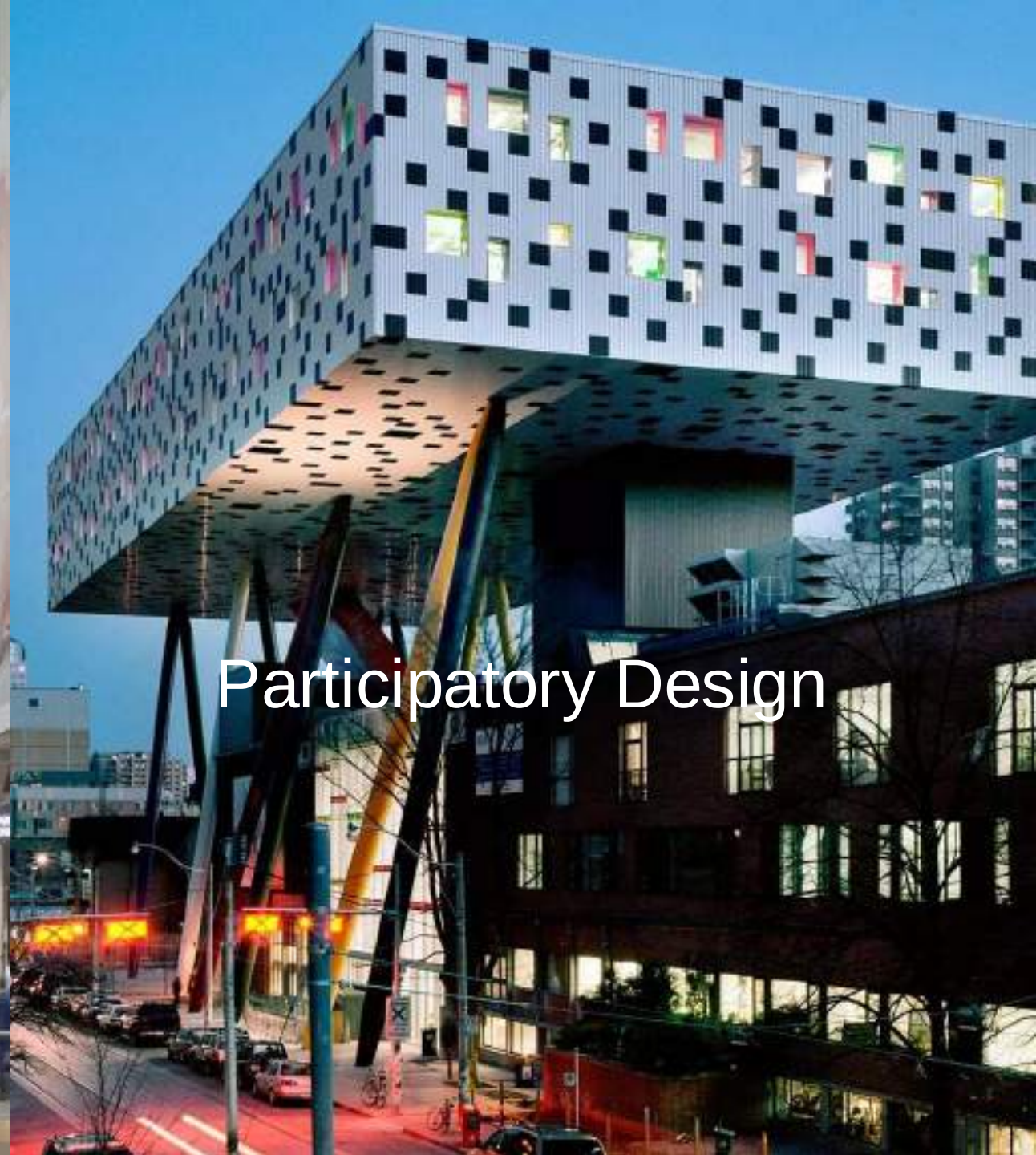
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Transforming Communities



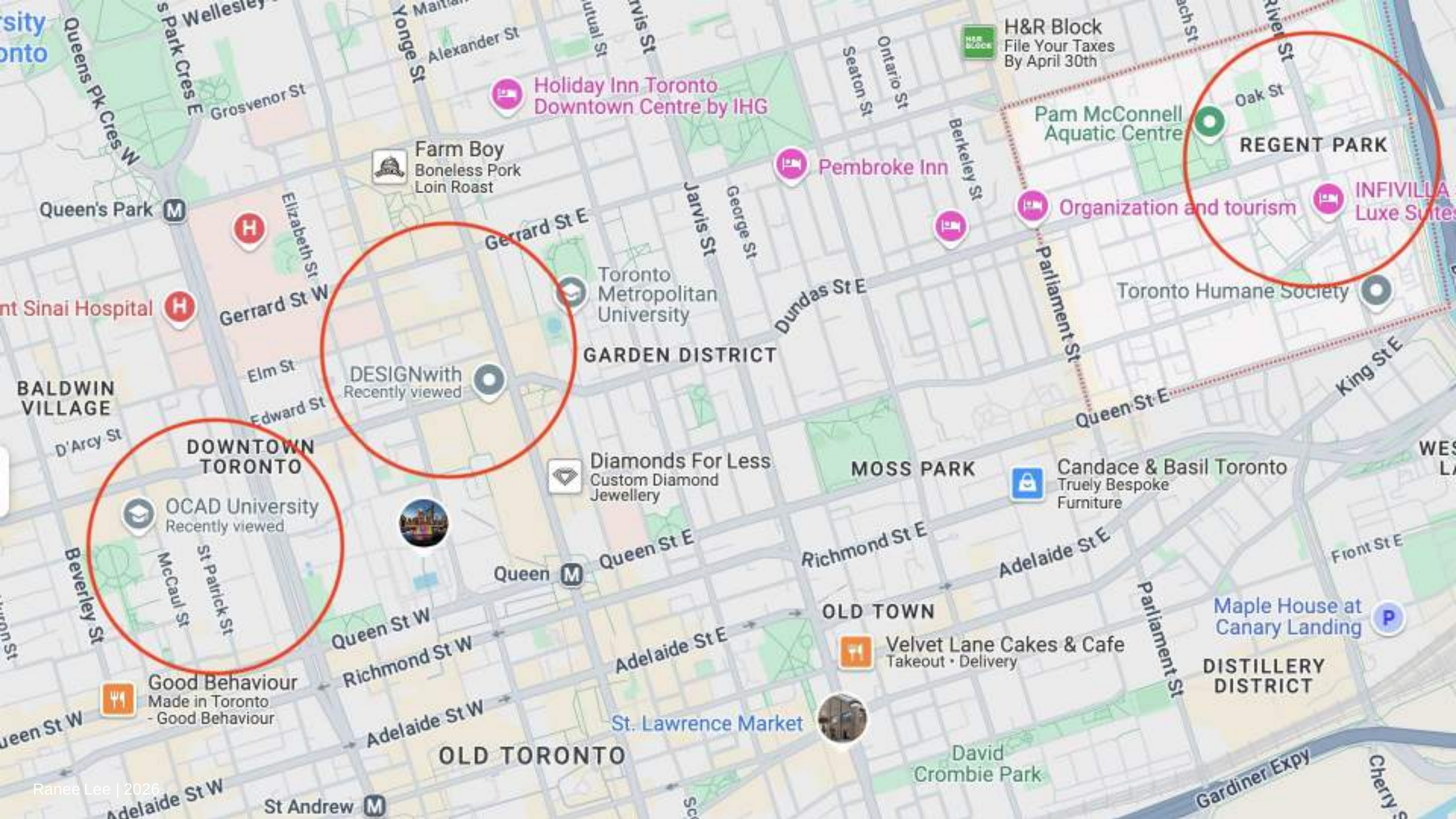
Participatory Design

What's the worst
thing that can
happen?



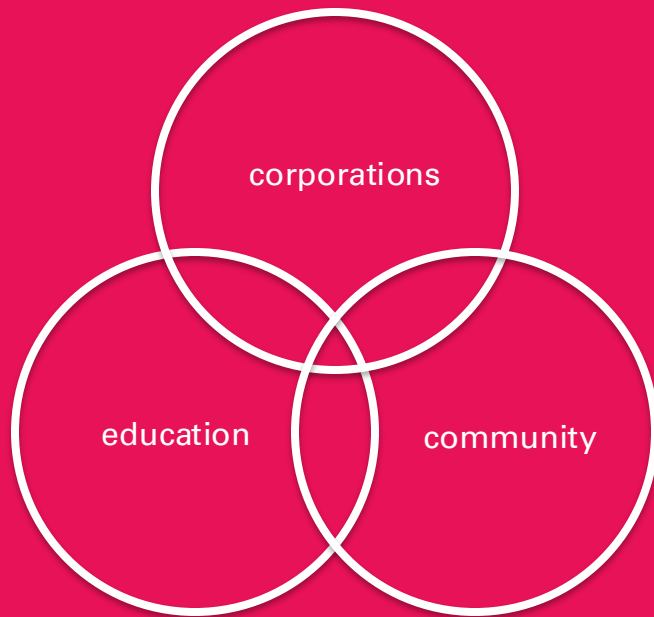
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What is innovation?

Environmental and social sustainability



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CF Cadillac
Fairview





Making connections.





Design can be
DESIGNwith is an inc
circular design. We
connections among
our values and lived
unite academia, corp
Our space, in partne
used to facilitate
community workshop
DESIGNwith reveals
To learn the

Transforming Communities

VALUE DESIGN



DESIGNwith Infinity Loop

Where the whole is greater than the sum of its parts





THE
POWER
PLANT

DESIGNwith
In partnership with

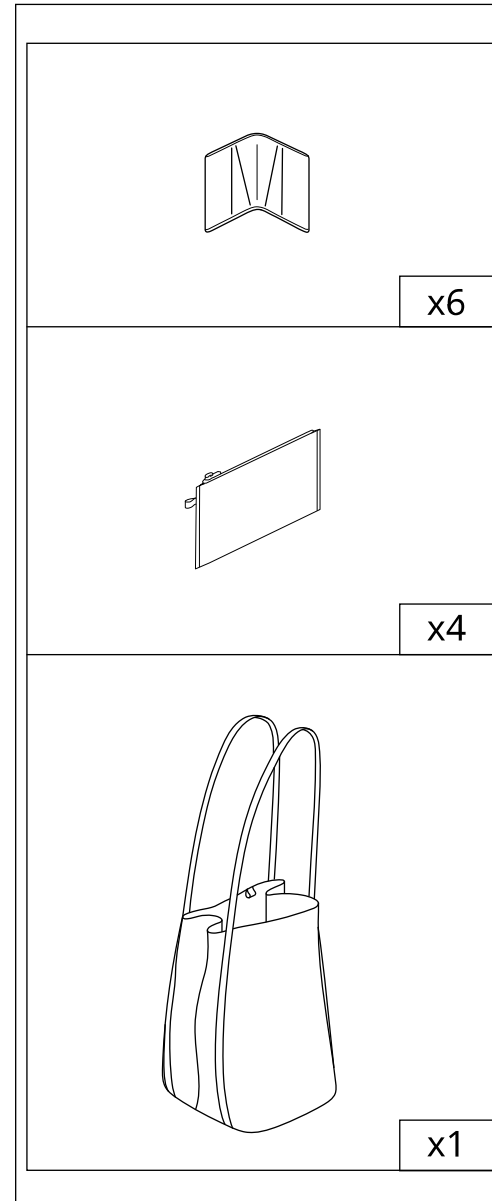
CF Cadillac
Fairview

OC
AD
U

OCAD UNIVERSITY

CITYSCAPE
DISPLAYS

Form Follows Care



THE
POWER
PLANT

DESIGNwith
In partnership with

CF Cadillac
Fairview

OCAD
UNIVERSITY

From Landfill to Limited Edition Zero-Waste Design Collection

The Power Plant Contemporary Art Gallery collaborates with an innovative design lab and women immigrant sewists to create one-of-a-kind fashion accessories made from recycled marketing materials



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From Landfill to Limited Edition Zero-Waste Design Collection



Since climate change affects marginalized communities the most, it is important to consider people and the planet during the design process. This innovative project exemplifies this principle with an exceptional result of a zero-waste collection promoting a more equitable future. From theory to practice, DESIGNwith lab embodies a caring design practice that considers people, undervalued skills, materials, and the environment as vital parts of an alternative economy.

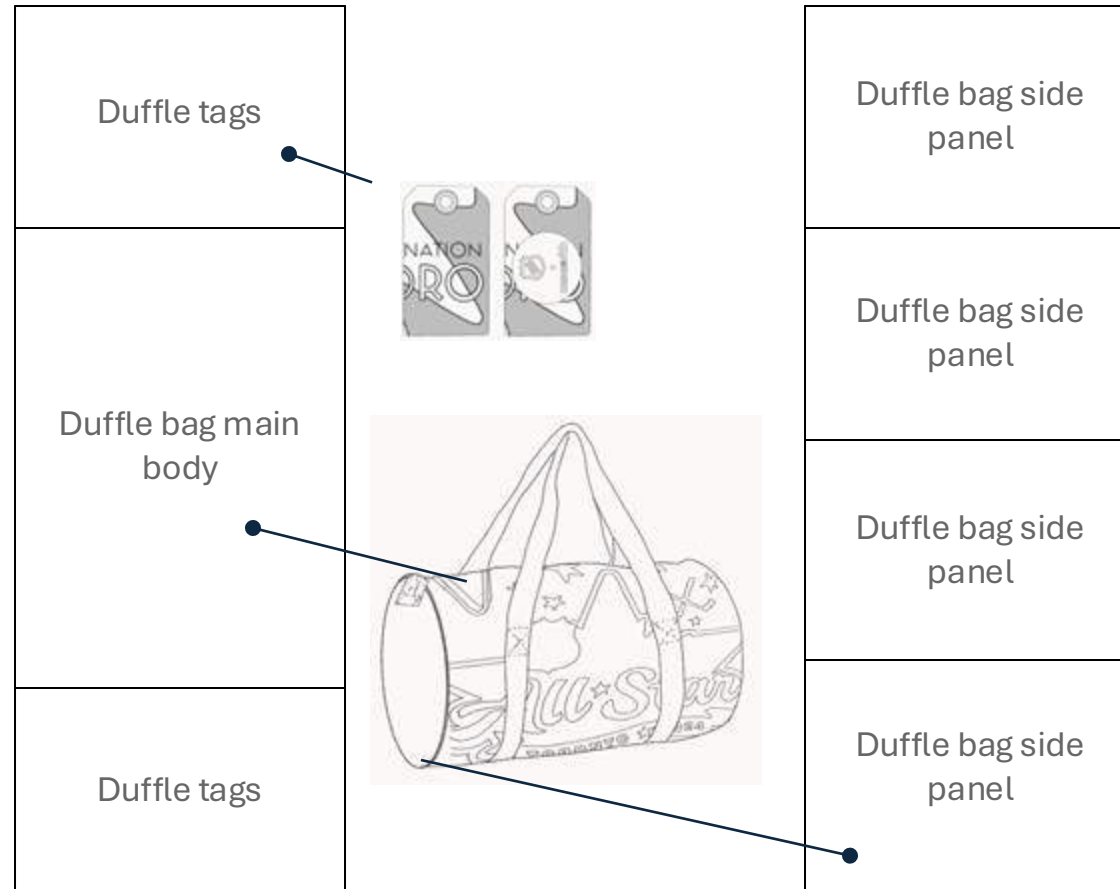


DESIGNwith
In partnership with





Our Zero Waste approach



The entire banner will gain **value** by being used as part of the bag, while the offcuts will be made into duffle tags, creating a circular economy.





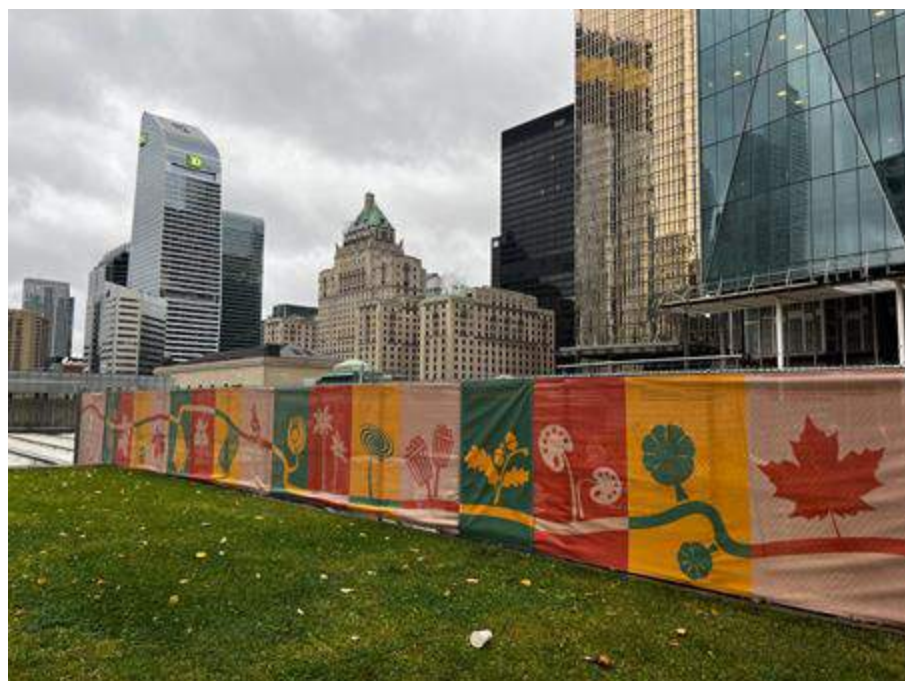
DESIGNwith Infinity Loop

Where the whole is greater than the sum of its parts





CIBC SQUARE



THE OUTPUT

NO. Products: 200

Products Made: 70 Shoe /
travel bags, 50 pencil /
cable cases, 80 laptop
cases



THE BANNER

Material: 9 oz mesh

Banner Sizes: 116 x
84", 823 x 69", 218 x
69", 85 x 69", 44 x
87.5", 197 x 69"

Banner Qty: 6 panels





THE OUTPUT

Product Qty: 10

Products Made: 10 duffel bags



THE BANNER

Material: 21.3 oz Vinyl

Banner Size: 26.75 x 71"

Banner Qty: 10





THE OUTPUT

Product Qty: 519

Products Made: 133

Tote bags and 386
clutches / pouches



THE BANNER

Material: 21.3 oz Vinyl

Banner Size: 26.75 x 71"

Banner Qty: 133

ARTS IN THE PARKS

**TORONTO
ARTS FOUNDATION**

THE OUTPUT

Product Qty: 9 large tents
(1512 sq. ft. per tent) and 9
flags

Products Made: 36 picnic
mats and 20 shopping
bags



THE BANNER

Material: polyester tent
and nylon flags

Tent Size: 1512 sq. ft. per
tent

Tent Qty: 9

**the
national
ballet of
canada**

THE OUTPUT

Product Qty: 24

Products Made: 24 tote bags



THE BANNER

Material: 21.3 oz Vinyl

Banner Size: 26.75 x 71"

Banner Qty: 24



Transforming Communities Through Circular Design + Social Innovation



Everyone is invited.

@designwith.ca | www.designwith.ca



DESIGNwith

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CF Cadillac Fairview





Peter Jones - Head of Sustainability, IKEA Canada

Circularity and how IKEA is designing for the future



Hej!

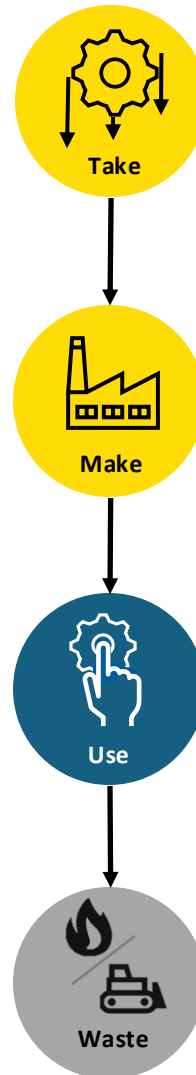


A close-up photograph of a person's hands, which are covered in tattoos, sanding a light-colored wooden plank. The person is wearing a dark blue t-shirt. They are using a rectangular block of yellow sandpaper. The background is a solid red color. The text "What is circularity?" is overlaid on the right side of the image in a white, sans-serif font.

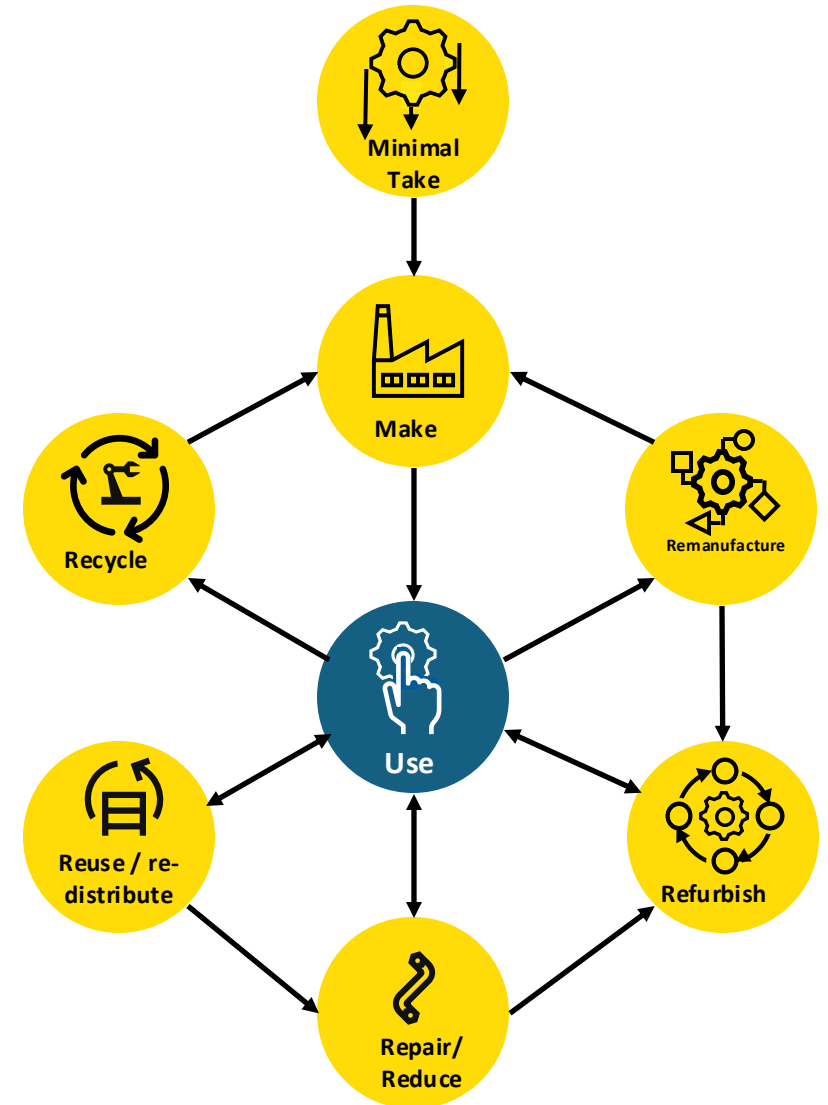
**What is
circularity?**

Going from a Linear to a Circular Economy

Linear Economy



Circular Economy



Minimal waste



Hej!

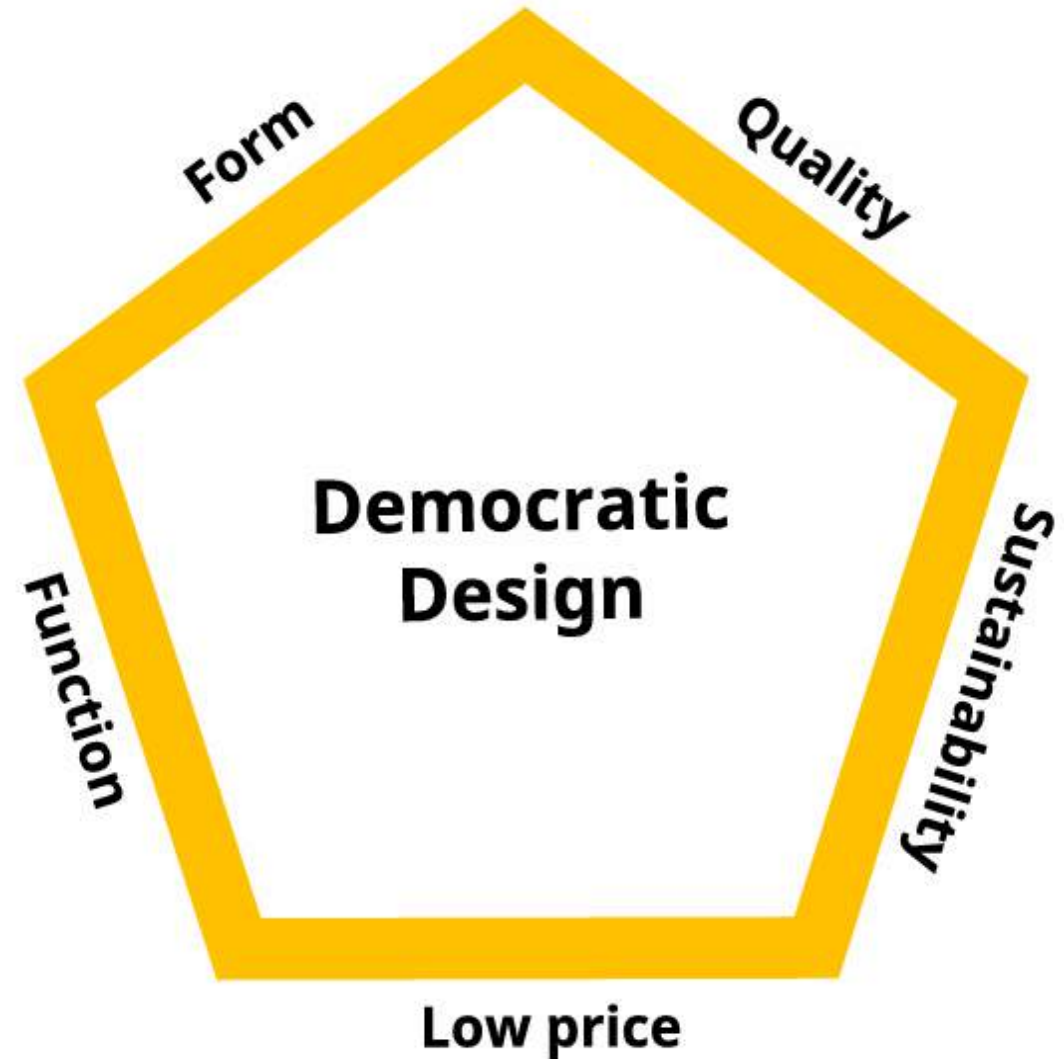




Circularity and Democratic Design

Democratic Design is at the heart of every IKEA product. It's our approach for designing, developing and evaluating IKEA products to ensure that they integrate good function, beautiful form and long-lasting quality, while also securing sustainability and low prices.

Circular design principles are one of several ingredients in the sustainability dimension of Democratic Design. They ensure that we design for the intended use of the product, while also planning for how the product lifespan can be extended.



Circular Design Principles



Design for renewable or recycled materials



Design for standardization



Design for care



Design for repair



Design for adaptability



Design for disassembly and reassembly



Design for remanufacturing



Design for recyclability

LISABO



PAX 2.0







‘Most things remain to be done. A glorious future!’

- Ingvar Kamprad



The Global Centre for Climate Action
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Discussion and Q&A

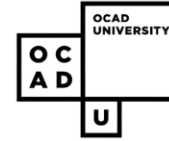
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Future GCCA Events

Sign up for updates!



The Global Centre for Climate Action
BMO Climate Action Speaker Series



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