TECNOLÓGICO
DE MONTERREY®

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TECNOLÓGICO DE MONTERREY®

Aalto University
Design Factory

Proyecto Integrador 1
Aaltonaut program

Sustainable Product Design

TEC innov action gym
MINDSET MAKERS

Aaltonaut

TEC innov action gym
MINDSET MAKERS

Aaltonaut

Session 05

Material Efficiency 01

Teams

Team	Leader	Members					Product
01	**Mauricio G.**	Luis M.	Julio	Mireya	Carlos S.		Children Toy
02	**Rebecca S.**	Alberto	David	Andrea	Victor		Kettle
03	**Tim**	Rilind	Marcelo	Maruca	Dennis		Shoulder bag
04	**Andres A.**	Diego	Lobo	Phillip	Genki	Lizz	Standing Lamp
05	**Mike M.**	Francisco	Carlos	Evelin	Manuel	Alberto	Office Chair
06	**Arturo M.**	Rodrigo	Delma	Daniel L.	Andreas	Samuel	Tennis shoes
07	**Diego G.**	Sofia	Regina	Andres	David		Backpack

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Sustainability Mind Maps

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Exercise 01.

Product disassembly / dismantle.

Suggestions for how to do the exercise

(based on Ab Stevels, 2014, e-Waste Academy, Shanghai)

Check

•current weights
•main functionalities
•and document!
•also, what is your eco-design strategy?
Prioritizing e.g. emissions, materials, toxicity, reusability, recycling?

Consider

- Product architecture
- Types of materials, accessibility of materials
- Joining techniques
- Ease of disassembly

Organize your team so that ONE person to

•Do the physical disassembly
•Keep the records of the all data
•Keep records of decisions, remarks, ideas
•Keep the overall eye, e.g. time & do the presentation on BOM

Report 02: Material list traffic light

Task 01 – 4%

Due: 17 September

BoM report.

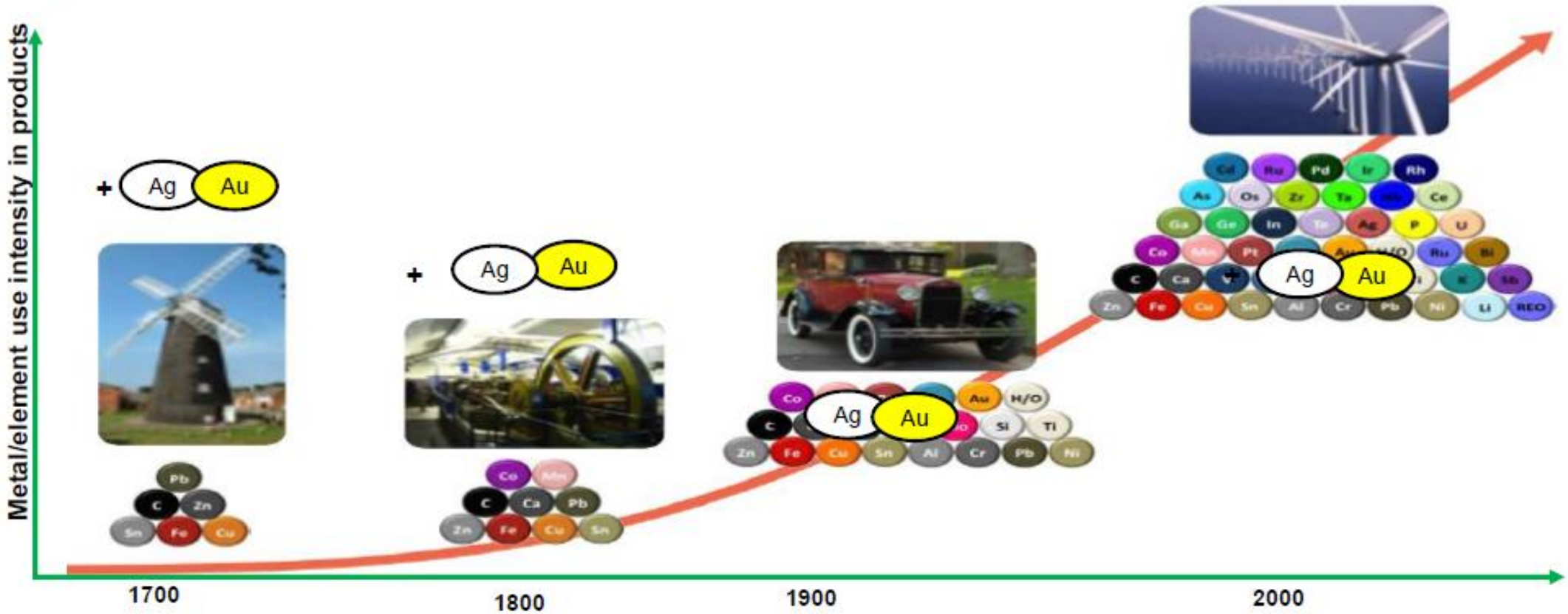
Assessment criteria

Criteria	5	0
Analysis (on eco design guidance, material assessment, product life cycle, problem reframing& user).	• Tasks are answered clearly and the reasoning is strong. • Conclusions are based on facts. • Own perspective on topic is visible. • Own figures / tables are used for clarification.	• Task is not accomplished. • Conclusions are not made or they are not based on facts.
Information sources (e.g. books, articles, web pages, expert interviews, standards & regulations).	• Multiple information sources are sought and used. • Source criticism is applied. • References are clearly connected to facts presented.	• The references and information sources are not used. • Opinions presented as facts.
Presenting (on line meetings, executive presentation, material poster, final product launch).	• The audience is taken into account in the presentation. • The presentation is clear and easy to follow.	• The presentation is not given or it is wrongly focused.
Debate (on product life cycle).	• Gives clear and fact based reasoning. • Strong background research	• Doesn't participate in the debate in anyway.

- Identify the bill of materials of your product.
- Weight the sustanability impact of the product (CES Edupack).
- Present results in a graphic manner.
- Describe your initial eco-design strategy.
- Submit a report with findings.

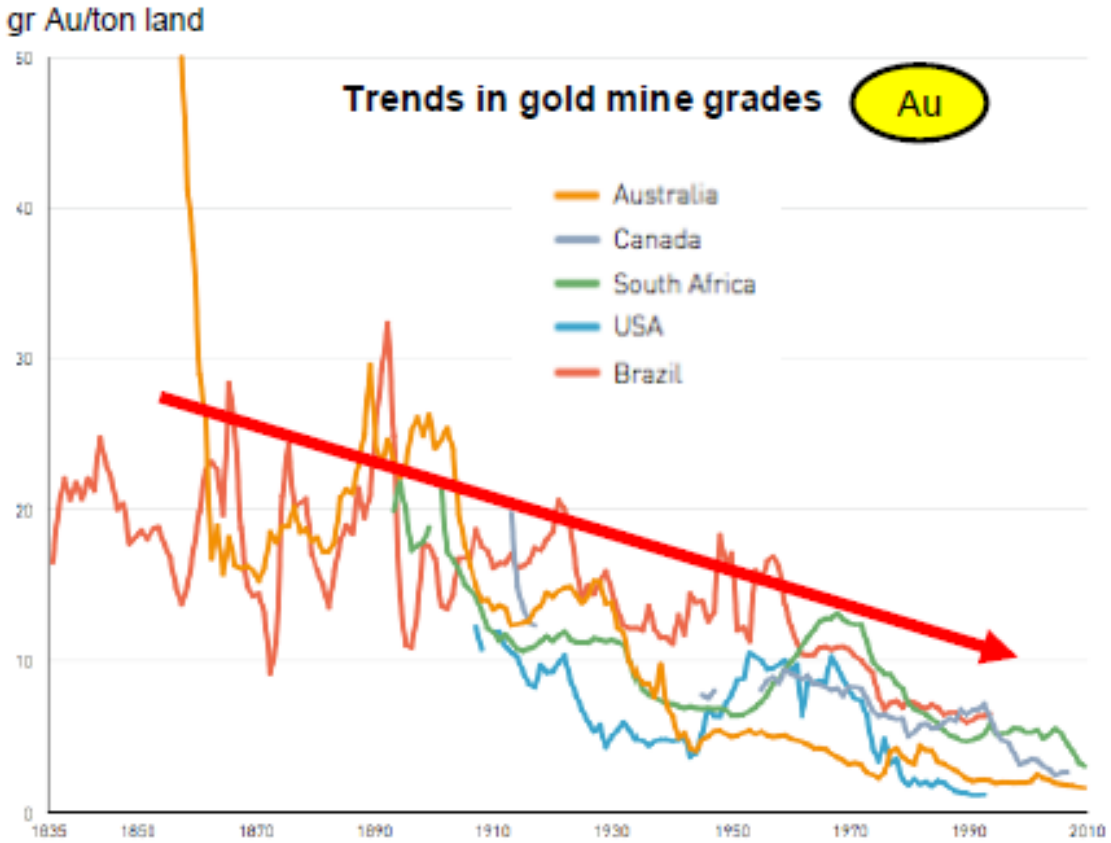
Increasing complexity of products

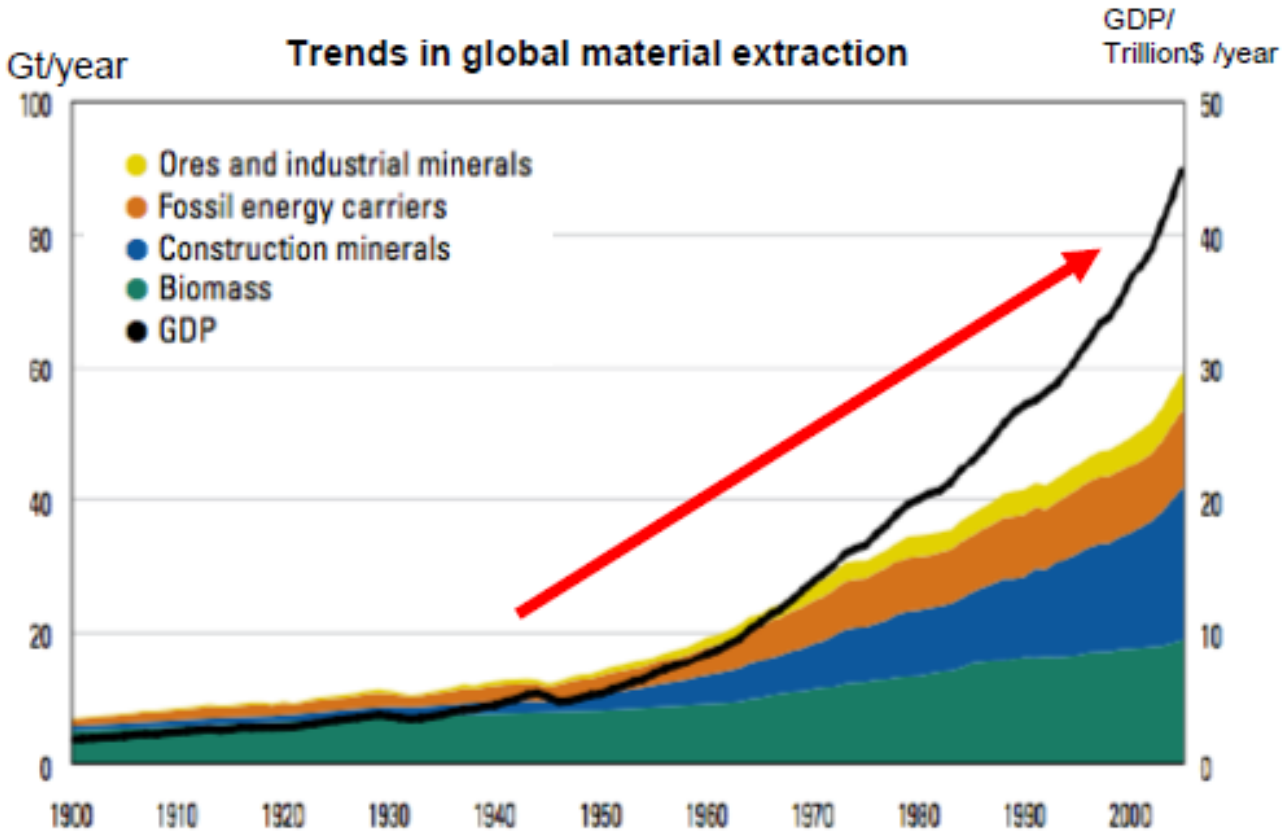
(UNEP, IPR report metal recycling 2013, p.53 & Kari Heiskanen, Tieteen päivät 2012)



Why material efficiency makes sense?

(Sources: UNEP, International Resources Panel, 2013, "Metal recycling report", p. 44 & 2011 "Decoupling material resource use and environmental impacts from economic growth", p. xiv)

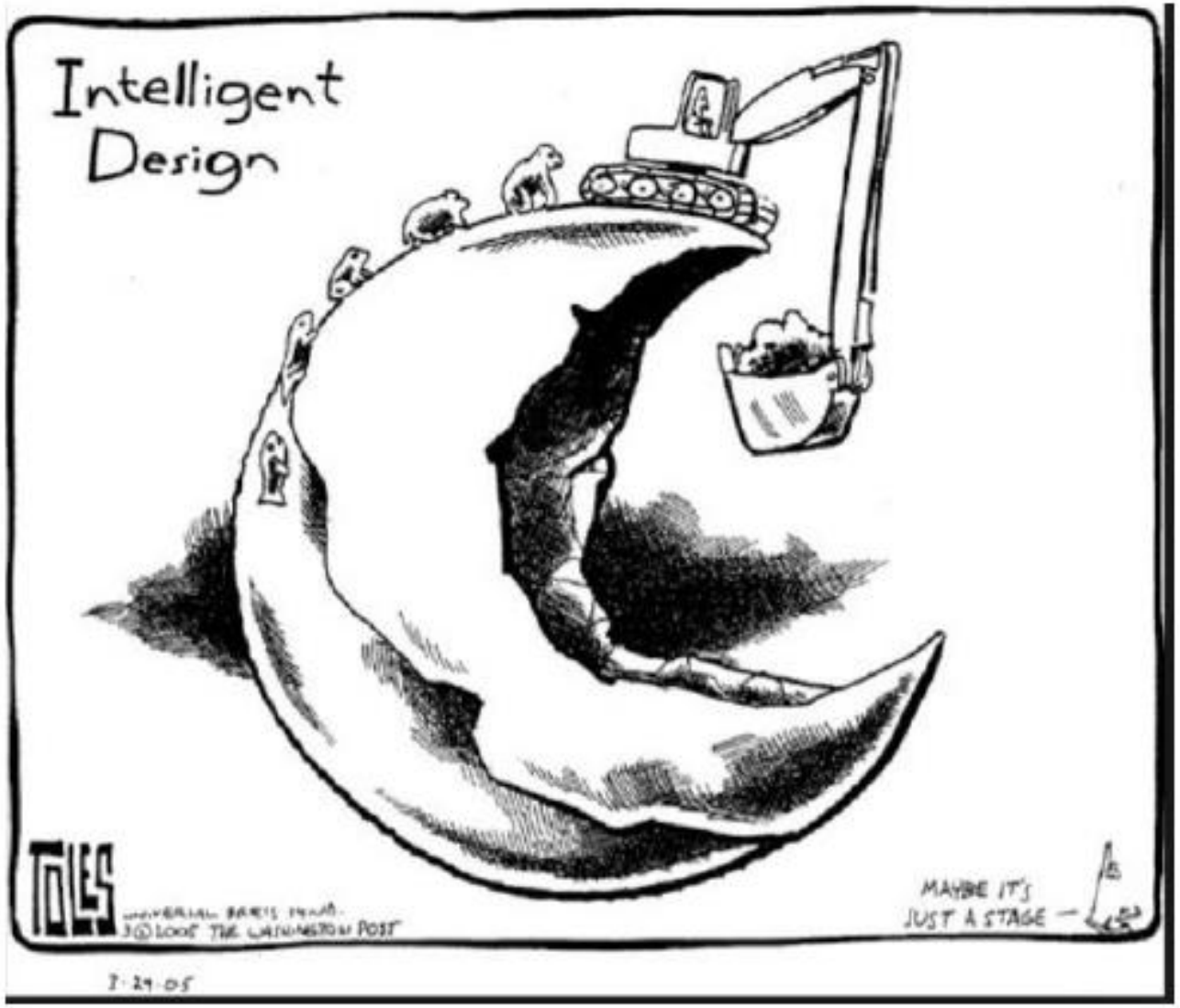




Resource decoupling:

Means reducing the rate of resource use per unit of economic activity.

This ‘dematerialization’ is based on using less material, energy, water and land resources for the same economic output.



What is this pic about?

Resource scarcity

+ Stocks
+ Degradation

Tom Toles, cartoonist

Report 02: Material list traffic light

Task 02 – 4%

Due: 01 October

Choosing materials – CES Edupack.

- Run a comparison of materials using CES Edupack.
- Choose one material to be replaced and improve the material efficiency of the product with a more sustainable alternative.
- Demonstrate and present your reports in a 3 slide presentation (max)
- Add your results to the BoM report (5 pages maximum of extra material).

Evaluation criteria

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Summary of course work

Reports	Presentations	Points
Eco design guidance	Max 2 slide / 5 min executive presentation on eco design guidance for team's product	**15**
Material list, traffic lights	Report on material content and environmental impact.	**10**
Product sustainability poster	Poster on material efficiency improvement using CES edupack	**10**
Product life cycle description	Product life cycle visualization	**20**
Product life cycle comparison	Defending own greenest product based on Product life cycle comparison. Criticizing opponent team's green product. (Debate)	**15**
User testing	Green product launch (final for all themes)	**30**
	Total	**100**

Tasks summary

Report	Task	Activity	Due date	Delivery	Points
01 Eco Design	1	Questions for Aalto and TEC course leaders.	30 August	Submit questions in Aalto Open Learning platform.	1 extra
	2	Mind map poster.	03 September	Poster for Innovaction.	2.5
	3	Eco design brief for Aalto Finland.	10 September	Report for Aalto mirror team on eco design guidelines in Mexico and USA. Submit meeting minute to Course Leaders.	2.5
	4	Eco design brief for Aalto Finland / Meeting.	21 September	Presentation in class. Max 2 slide/5 min on eco design guidance for team's product.	2.5
	5	Briefing for BigCo CEO on the sustainability guidance in Europe and Mexico.	01 October	Executive presentation Max 5 slides.	2.5
	06	Teamwork co-evaluation	01 October	Co-evaluation on teamwork	5

Tasks summary

Report	Task	Activity	Due date	Delivery	Points
02 Material list Traffic light	1	Bill of materials (BoM)	17 September	Submit BoM report	4
	2	Choosing materials – CES Edupack	24 September	Presentation on findings. Report addition.	4
	3	Teamwork co-evaluation	01 October	Co-evaluation on teamwork	2

Whiteboard question.

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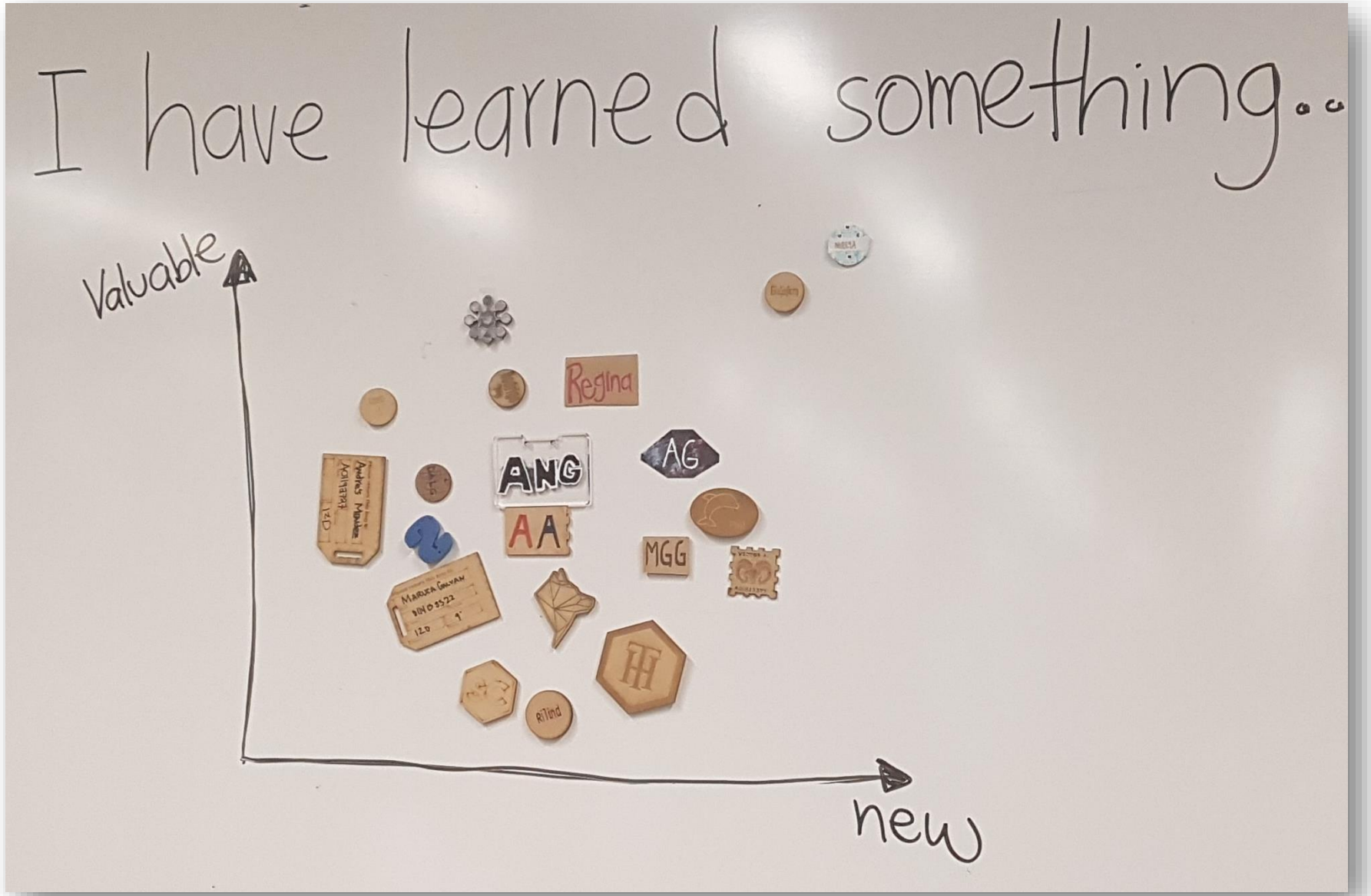

I have learned something...
Valuable
new
Regina
ANG
AG
AA
MGG

How long does it take to paint the Golden Gate bridge?

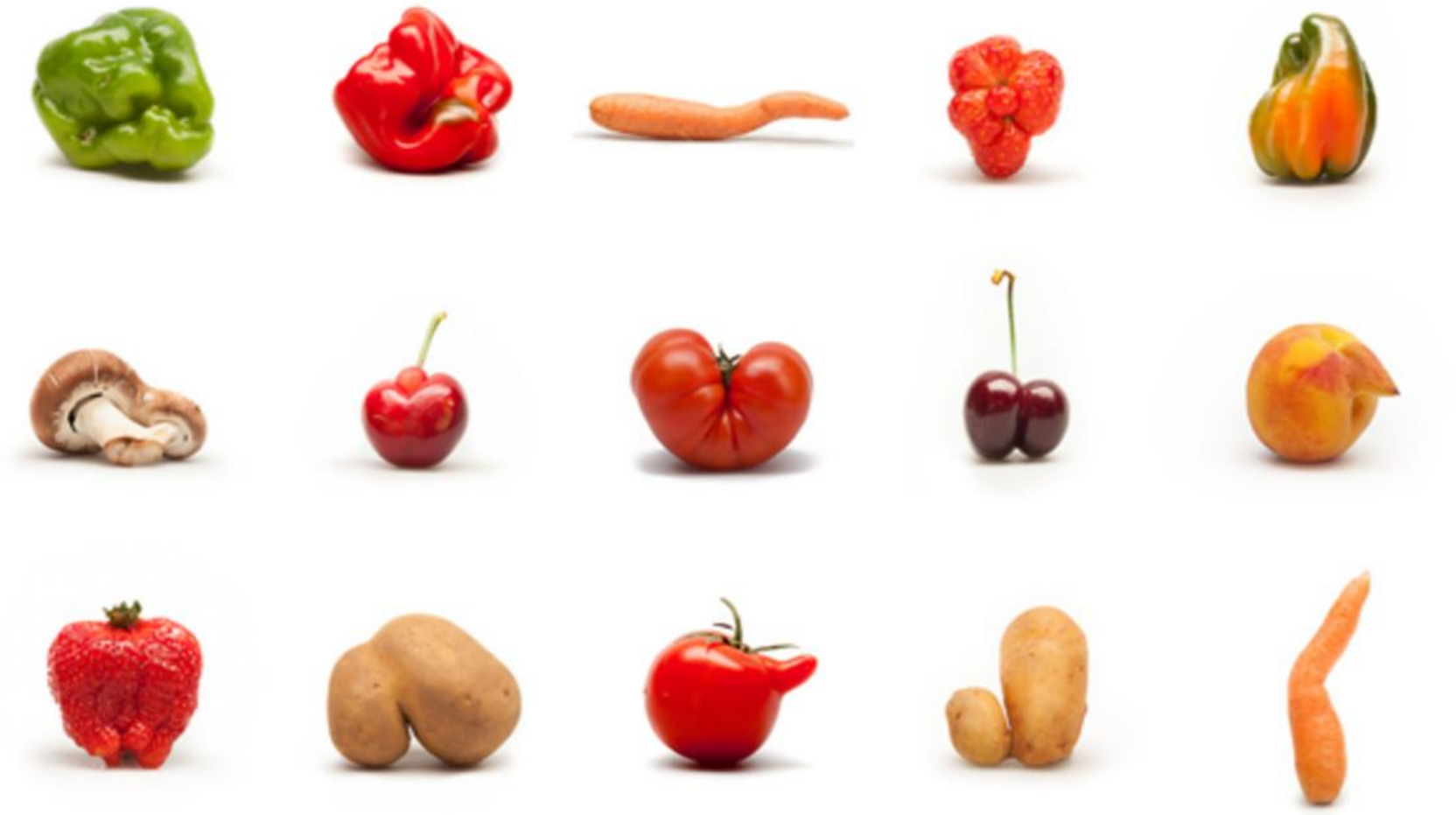
Leeds, UK Rusty building

6 Easy steps to be sustainable.

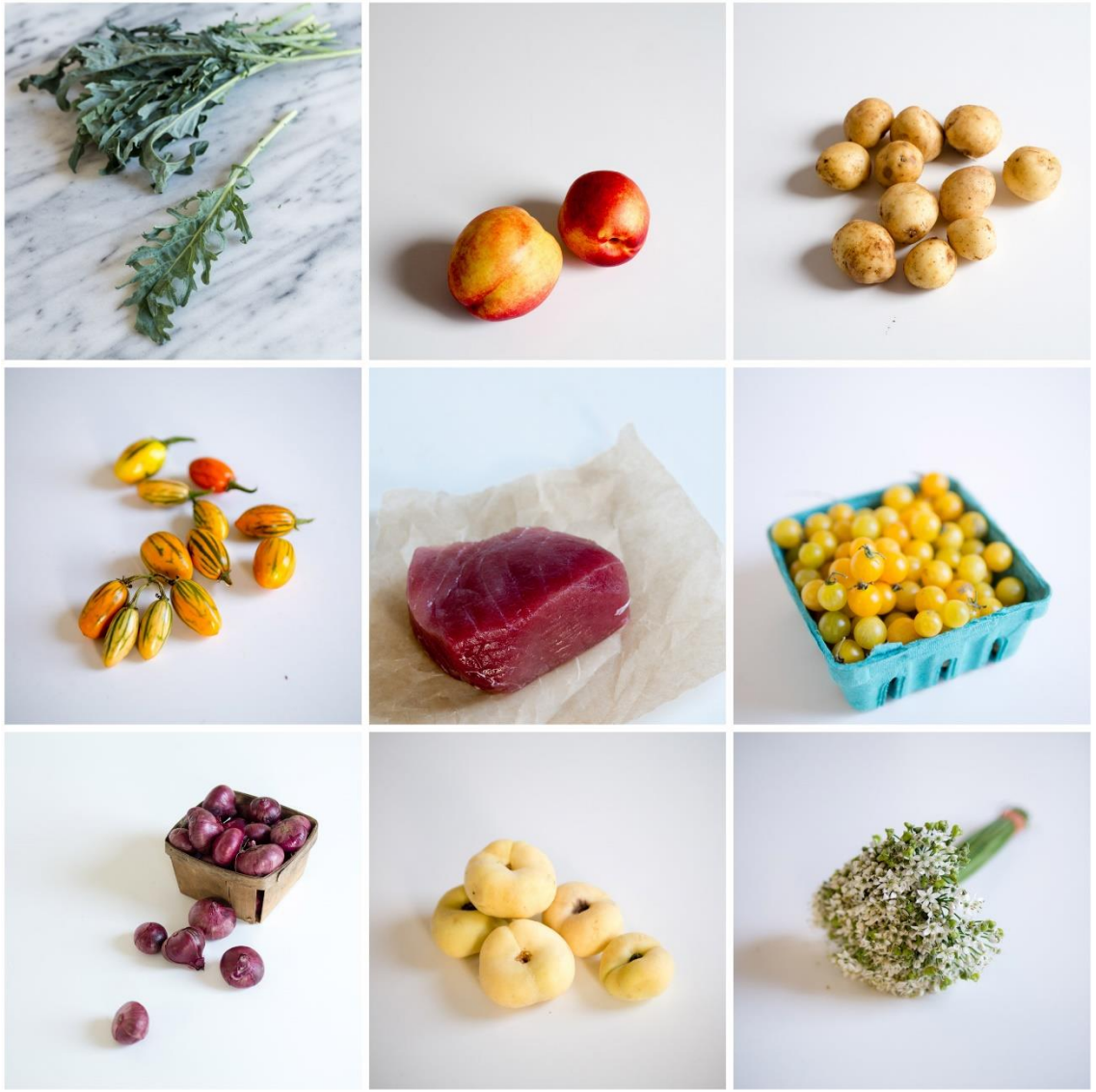
Use the stairs

Use near due date products

Buy ugly vegetables



Buy season produce



Consume local

Bring your bag

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Teamwork evaluation

Criteria	5	0
Participation in the team's assignments.	•Does own share and support others' in their work. •Participates actively in sharing the work evenly and efficiently. •Builds up the positive working atmosphere •Presents own ideas. •Builds on others' ideas.	•Doesn't accomplish tasks. Others need to do his/her share. •Lowers the motivation in team. •Doesn't bring in own ideas and strongly criticizes others' ideas.
Communication.	•Communicates proceedings, challenges, information and own whereabouts in a way which helps others in their work. •Corrective feedback is constructive and he/she gives positive feedback on other members. •Takes the given feedback into account .	•Doesn't communicate. •Doesn't give feedback when needed. •Neglects the given feedback .
Time management.	•Work proceeds independently in the schedule given.	•Assignments are not returned

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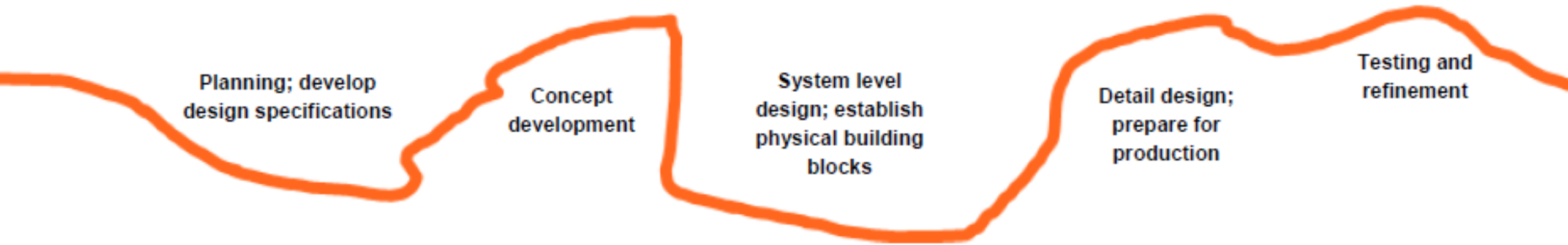
		Total 100

During the course the students will develop their product development expertise in the field of sustainability



Course goals

During the course the students will develop their product development expertise by gaining

knowledge on product life cycle impacts, on material choosing, material efficiency and on guidance towards sustainability.

Course goals

During the course the students will develop their product development expertise by gaining

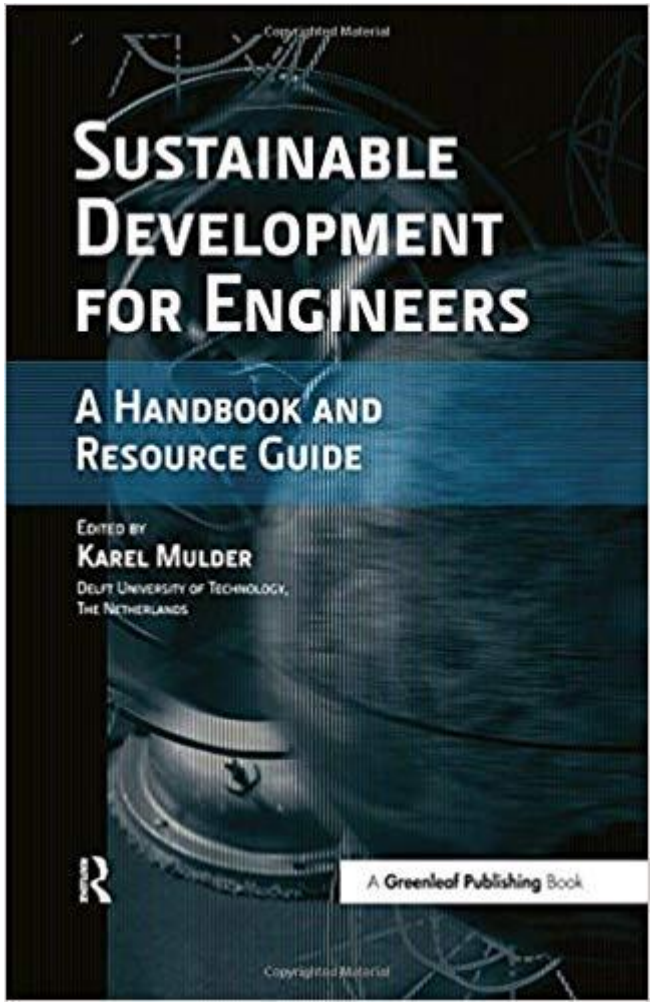
skills in assessing product's impacts comprehensively and realizing the different perspectives and uncertainties within these assessments.

Course goals

During the course the students will develop their product development expertise by gaining

Fact based orientation in sustainability.
*Responsible **attitude** towards own choices as a product developer and as a consumer.*

Recommended lectures



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