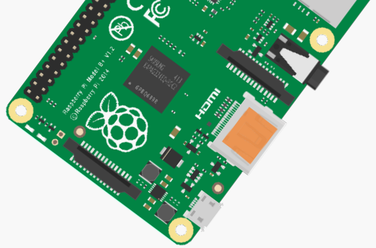
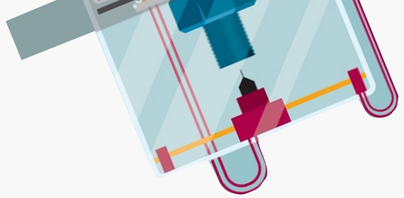
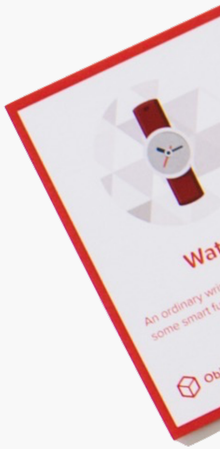
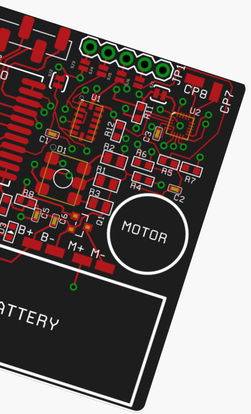


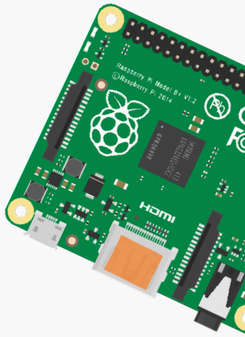




Tiles Idea Generation workshop: participatory ideation for the IoT

http://tilestoolkit.io/ | @tilestoolkit





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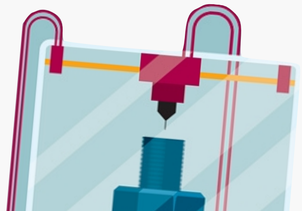

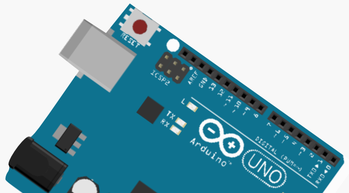

nice

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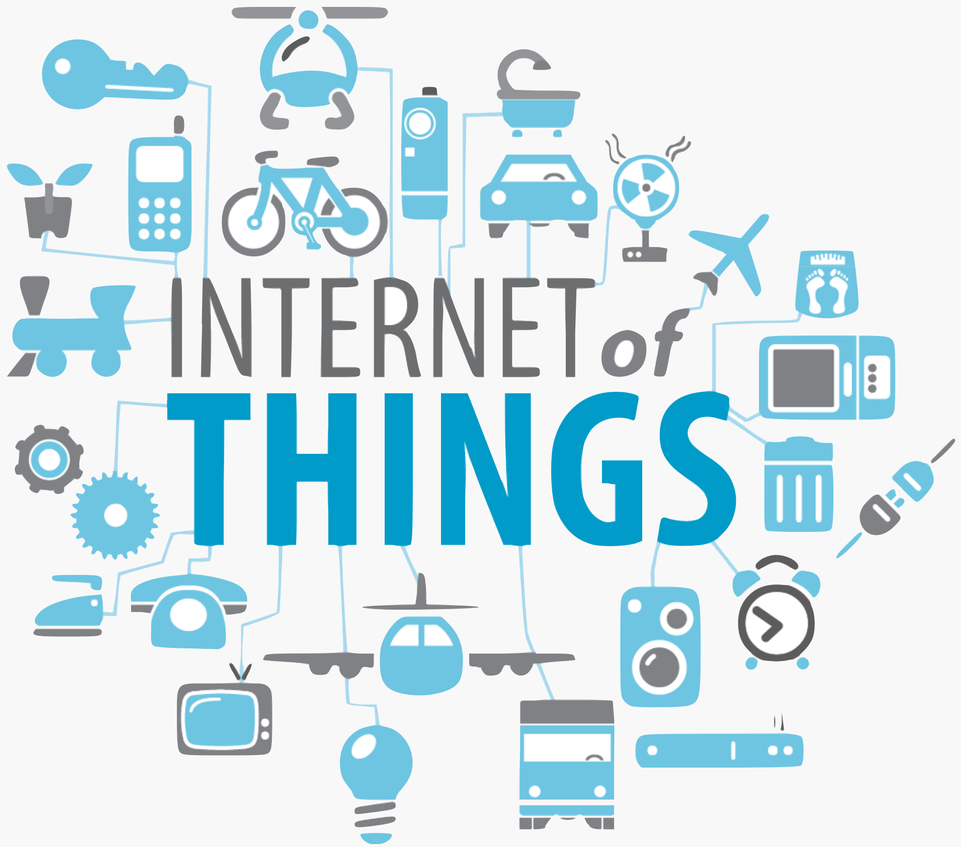
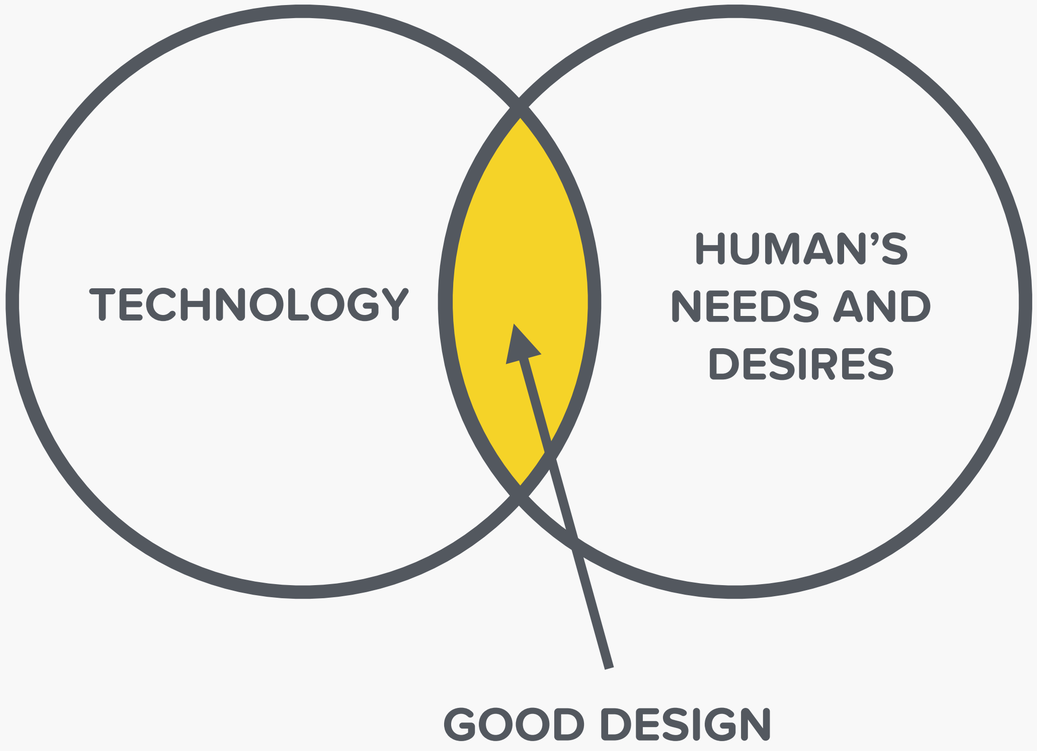
Department of Computer Science

Agenda

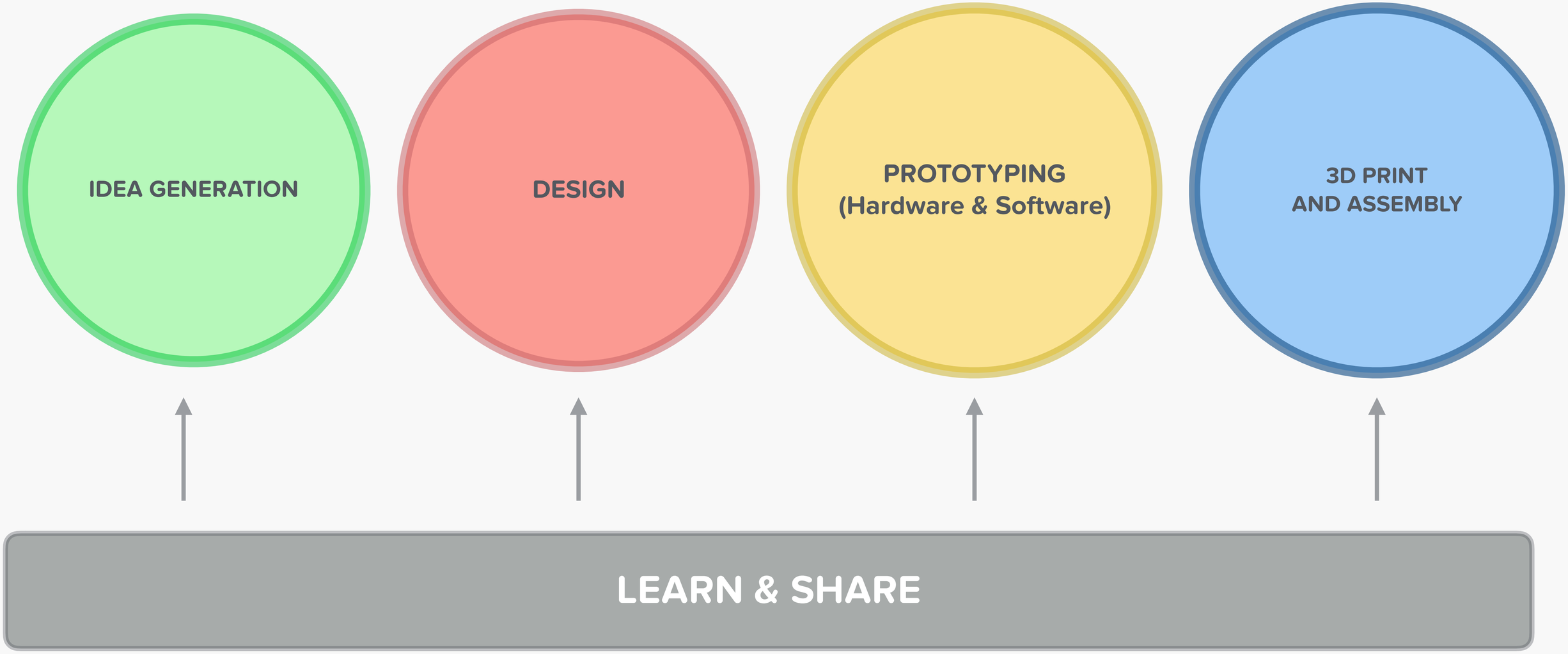
- Introduction: 10min
- Tiles Idea Generation Workshop: 60min
- Pitch of your idea: 30min
- Reflection and closing words: 20mins

WHY

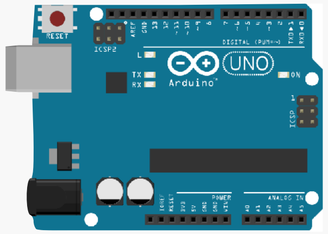

INTERNET of
THINGS


TECHNOLOGY
HUMAN'S NEEDS AND DESIRES
GOOD DESIGN

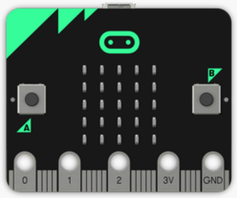
IoT application development process



Ideo Cards

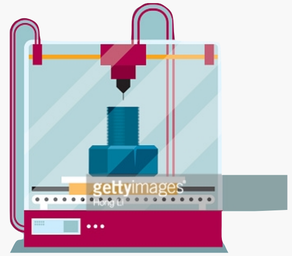


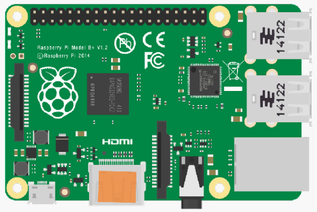
Arduino



Microbit

python™



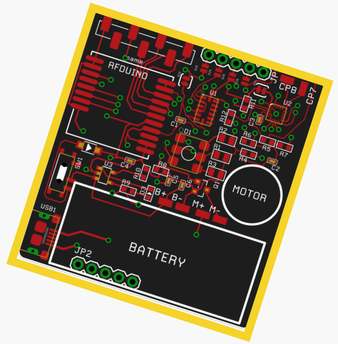


Raspberry pi

JS

Little bits

Tiles Cards



Tiles Stickers

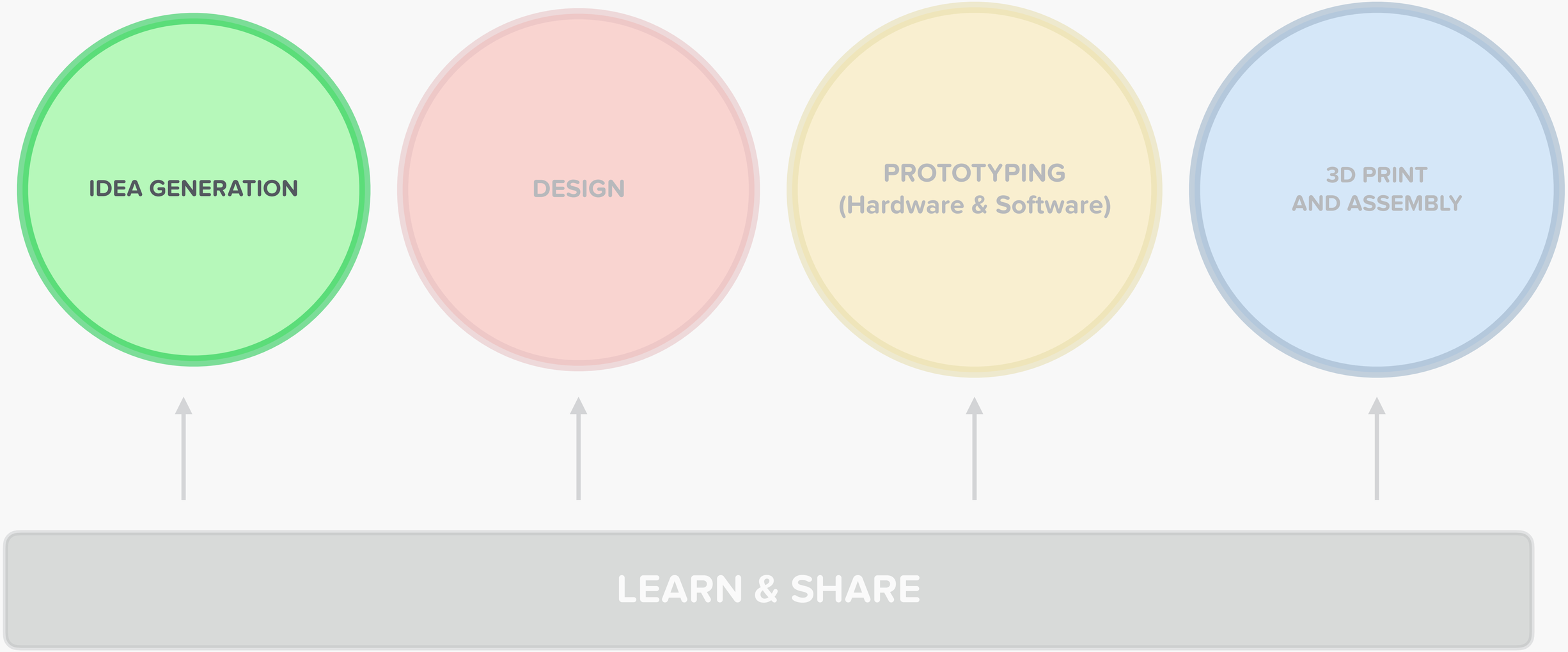
SCRATCH

IDEATION

PROTOTYPING

3D PRINT & ASSEMBLY

IoT application development process



Tiles IoT Cards

- Involve end-users in co-design
- Keep ideation grounded
- Novel products and UXs
- Augmentation as a design strategy
- Prepare for prototyping
- Domain-specific extension packs (Smart Cities)

PROBLEM

IDEA

DESIGN

PROTOTYPE

PRODUCT

TILES CARDS

+

TILES WORKSHOP

THINGS & DATA DESCRIPTOR

CREATIVITY TRIGGERS

REFLECTION LENSES

Smart City Extension Pack (~30 cards)

Bus stop
A bus, tram or tube stop.
Things T-29

Park
A public park in an urban area.
Things T-34

Landmark
Notable object or building in an urban space.
Things T-42

Public bin
A public bin for waste or recycling.
Things T-28

Building
A building found in urban areas, e.g. office, gym, store, school, university, restaurant.
Things T-35

THINGS
The physical objects that are augmented with technology to be made interactive.

Noise
Noise data from the ambient surrounding the object.
Sensors SN-8

Water quality
Water quality of the ambient where the object is placed.
Sensors SN-7

GPS coordinates
Latitude and longitude coordinates of the object.
Sensors SN-6

Air pollution
Pollution of the air surrounding the object.
Sensors SN-5

Energy
Energy usage of the object.
Sensors SN-9

SENSORS

Participation
Citizen participation in public life is a key factor to achieve the goals of a smart city. It is often challenging to convince citizens to participate even when decisions will affect their lives directly like in urban planning, public transport organization and planning of cultural activities. How can technology help promoting awareness and participation in urban life?
Scenarios SC-4

Transportation
Urban mobility contributes vastly to emissions, with passenger cars being mostly used. This development entails a necessary change in people's behaviour towards sustainable transportation means such as walking, biking or public transport. How can technology facilitate reflection as a strategy to support people or communities in adopting more sustainable mobility behaviours?
Scenarios SC-5

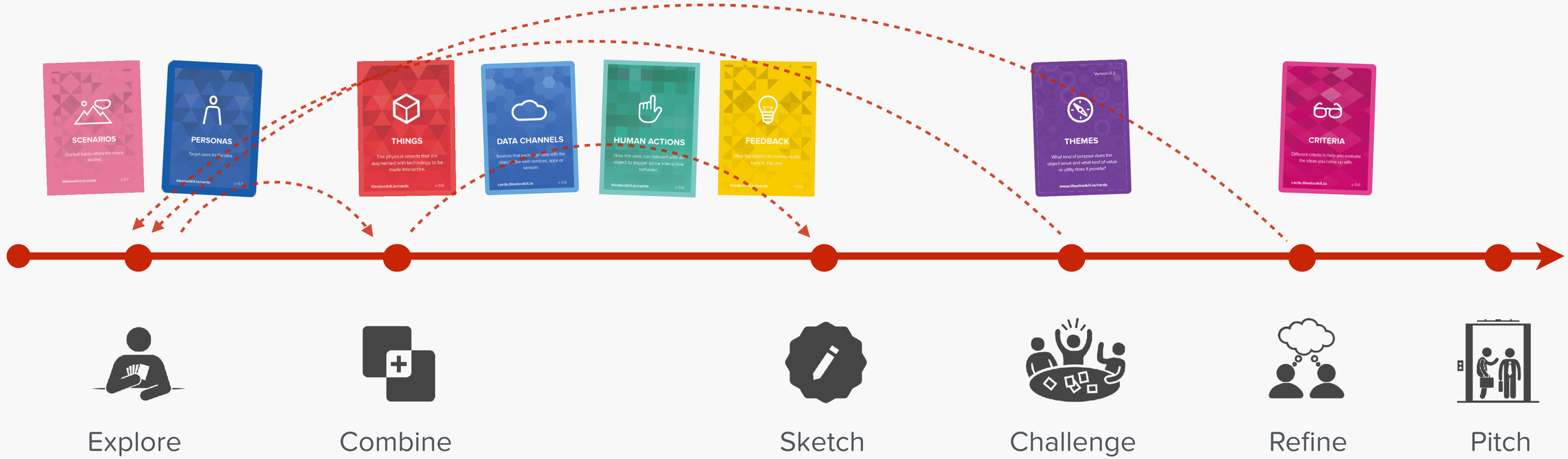
SCENARIOS
Context traces where the idea is applied.

DOMAIN CARDS

Idea Generator
Storyboard
Themes
NTNU
Norwegian University of Science and Technology

Ideas
TRIGGERS
THINGS
Storyboard
Themes

TILES CARDS IDEATION PROCESS



CARDS

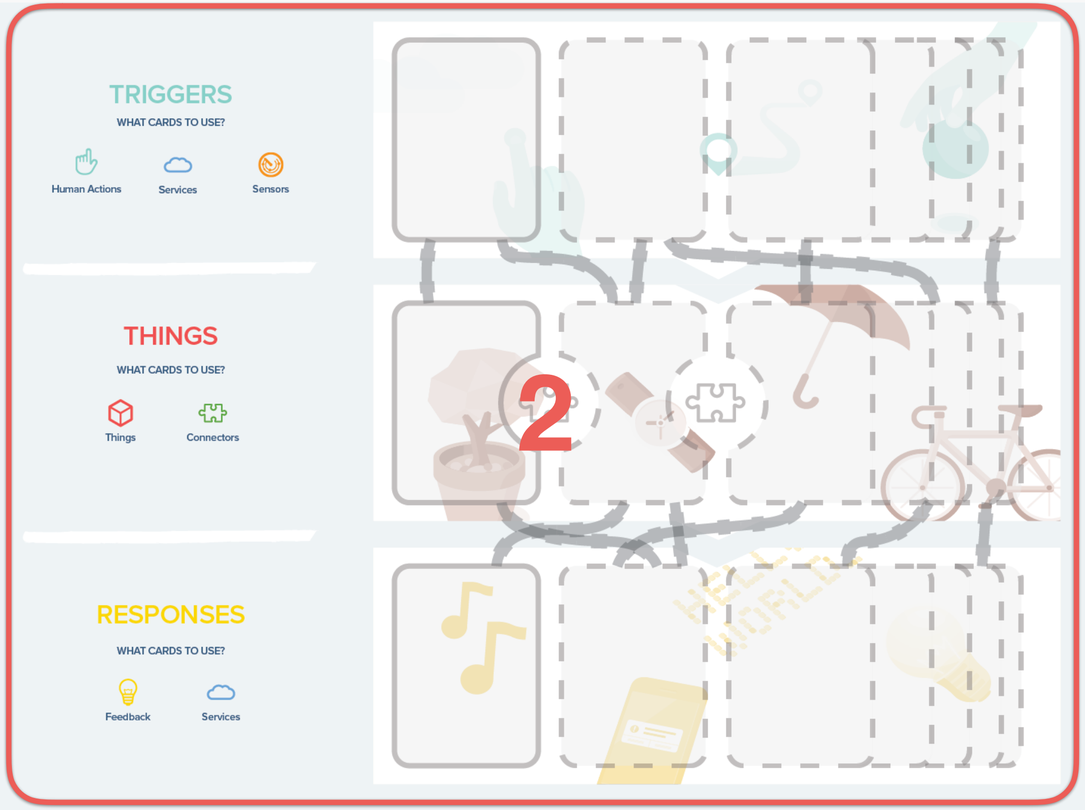
EXPLORE

FRAME

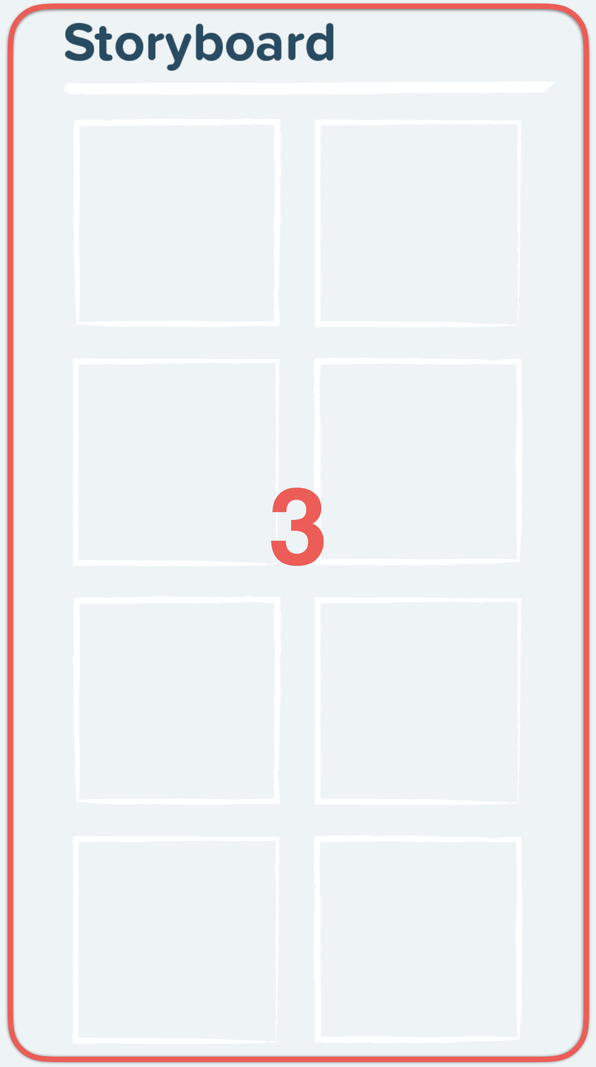
DARE

ANALYSE

Tiles Idea Generator



Storyboard



Reflection criteria

Elevator pitch

Playbook

1 — *Approx. time: 5 min*

Start selecting a persona and a scenario that you have agreed to focus on

What specific needs or problems are you trying to solve for the selected user? You can place the chosen Scenario and Persona cards in the card placeholders on the bottom left corner of the board.

2 — *Approx. time: 20 min*

Refine the mission

Challenge yourself to think creatively about the purpose or mission of your idea. Use up to three Missions cards to challenge and guide your idea.

3

What objects are central to your user?

What objects are central to your users and can help them solve the needs you have identified? Look through the Things cards, select Things as your starting point and place them on the card placeholders in the THINGS section of the board.

4

What actions trigger the Thing?

Explore what types of input are needed, whether they are Human Actions, Sensors or Services from an external source. A thing can have multiple triggers, and the same trigger can affect multiple things. Place your selections on the card placeholders in the TRIGGERS section of the board.

5

How does the object respond when it is triggered?

Responses allow the object to communicate back to the user when it is triggered, either by a direct Feedback from the object itself or by sending data to an app or service through Services. Place your selections in the RESPONSES section of the board. If you like, show how multiple objects are connected using Connectors cards in the THINGS area.

6 — *Approx. time: 10 min*

Flesh out the idea

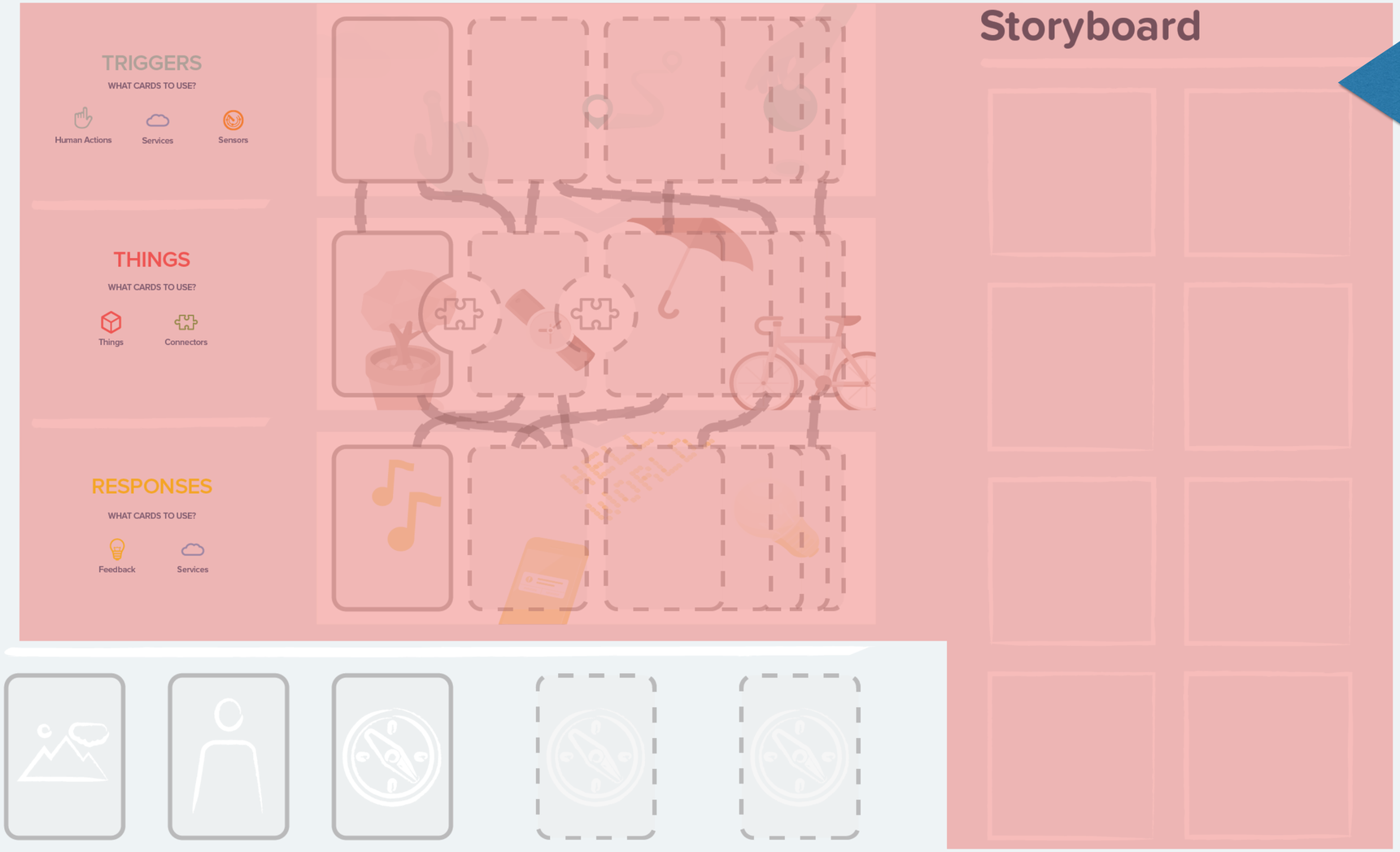
The Storyboard section of the board is your sandbox to describe and illustrate the idea you are working on. Try to make notes and sketches to show how, where and when the concept works and looks, and what it might feel like to use it. Imagine a story which depicts a use case for your object, you can sketch each step on a post-it and stick them in the boxes.

7

Reflect and improve

Look through the different Criteria and discuss how well your concept scores on each. Select a few strenghts and weaknesses of the concept, and see if you can come up with improvements to resolve the weaknesses, you can change the other cards and the storyboard if you feel the need. Write down a brief description of the final idea in the Elevator Pitch box.

Tiles Idea Generator



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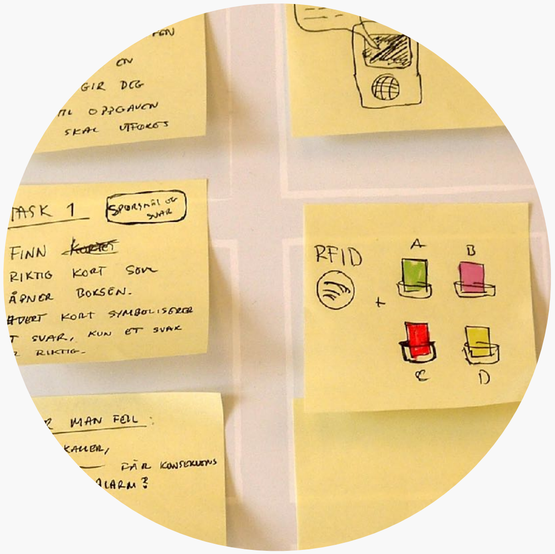
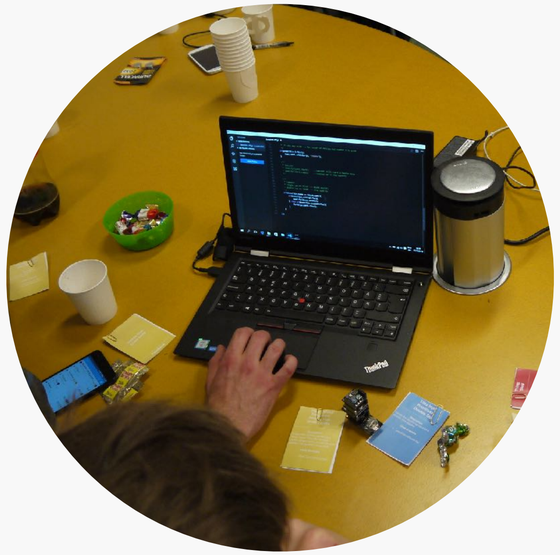
Expected learning outcomes using Tiles Cards includes a mix of technical, soft and design skills

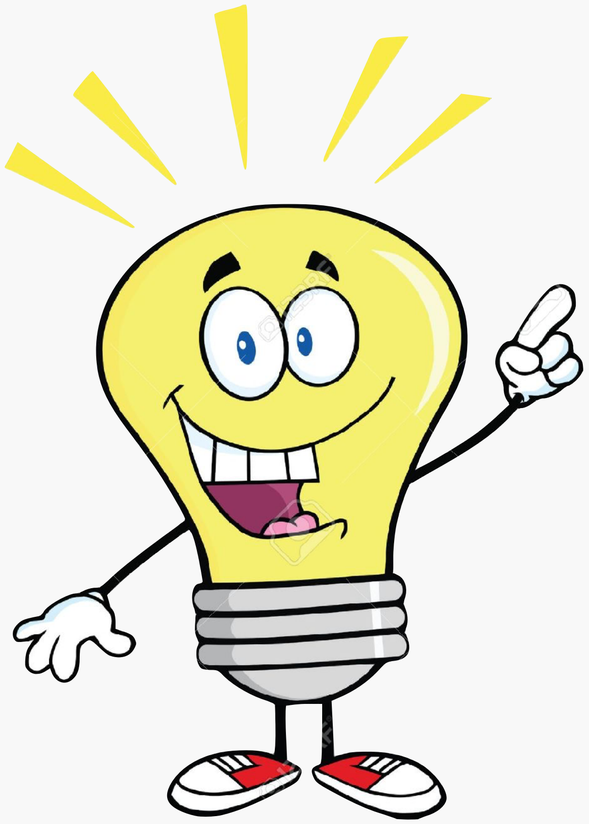
- Design thinking skills (sketching, pitching, ..)
- 21st Century soft skills (collaboration, reflection and creativity)
- Basic IoT concepts (data sources, inputs, outputs, ...)
- Basic Interaction Design and UX concepts (usability, utility, ...)
- Problem elaboration skills (scenarios and personas)
- Foundations of electronics and coding





Remember:

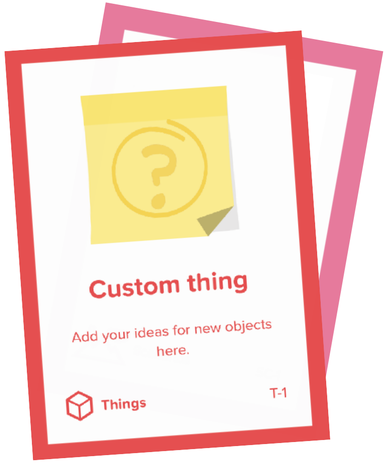
- Use post-its
- Leave everything on the board when finished with the last step (cards, post-it, etc)
- You can always go back and change your design
- You can use as many cards as needed
- There is no wrong or correct answer
- Have fun!



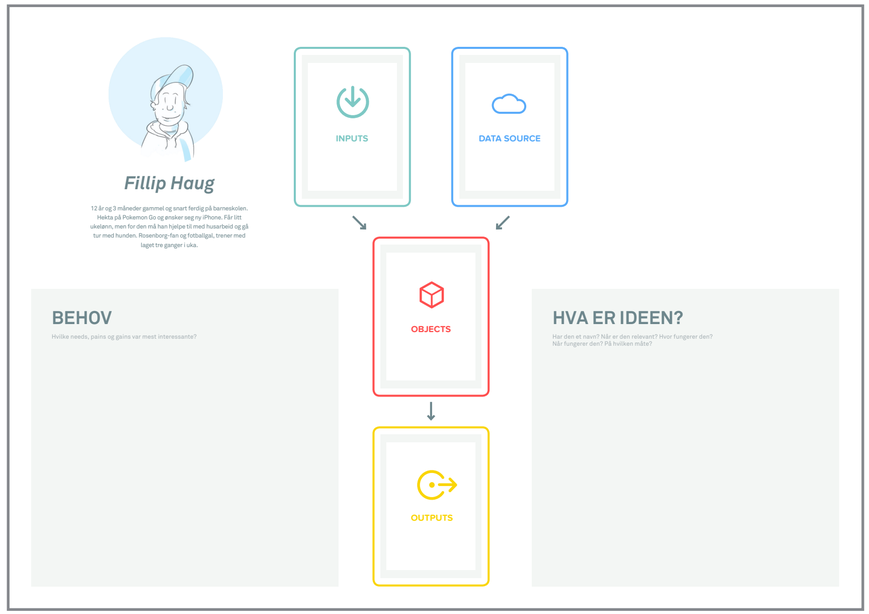
Have some great ideas!

40min ideation with Tiles Cards

...you can extend Tiles!



BLANK CARDS



CUSTOM PROCESS/BOARD

DERIVATIVES

start forking our git repository: https://github.com/tilestoolkit/tiles-IoTcards

How to get Tiles Toolkit

- Tiles is licensed under CreativeCommons BY-NC-SA and free to use for educational purposes

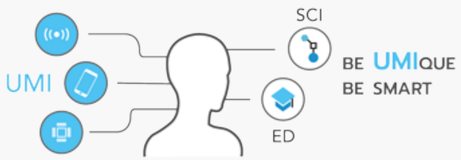
- The cards can be downloaded at http://tilestoolkit.io
- You can print them at home or get via card-printing services like http://makeplayingcards.com and http://drivethrucards.com

- Cards source files and workshop material (board and playbook) are available at https://github.com/teseolab/tiles-IoTcards

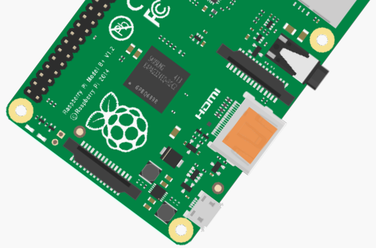
- Material about how to use Tiles to teach kids about design and IoT is available via the UMI-SCI-ED project http://umi-sci-ed.eu/

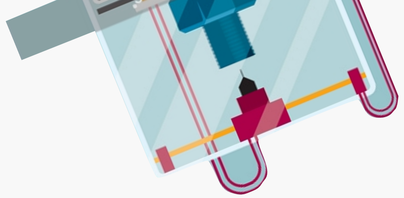
- We collaborate with professional designers to organise workshop for schools and organisation, please contact workshop@tilestoolkit.io for a quote.

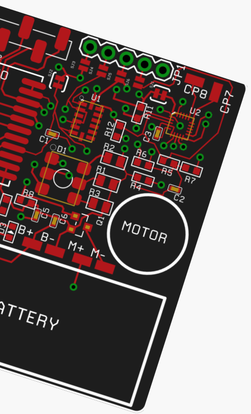
Extended learning scenario



- The UMI-SCI-ED EU project has developed an extended learning scenario for Tiles Cards that includes:
  - Warm up activities to teach basic and needed concepts of IoT supervised by instructors
  - Tiles workshop with predefined scenarios and personas
  - Supervised prototyping of ideas developed with IoT cards e.g. with toolkits such as Tiles Stickers, Micro::bit or Arduino
  - Follow-up learning assessment with quiz and questionnaires
- Recommendations for teachers to implement the scenario are provided at http://umi-sci-ed.eu (requires registration to the portal, search for “Tiles Inventor Scenario”)

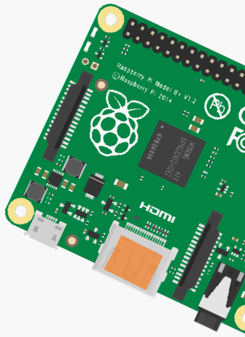






Thanks!

http://tilestoolkit.io/ | @tilestoolkit



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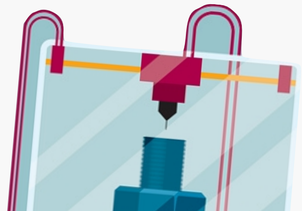
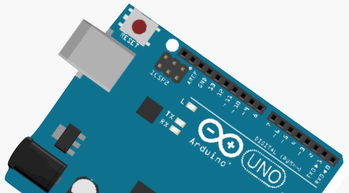
The work in this paper has been co-funded by the Norwegian Design and Architecture Centre. We are grateful to Nice Industridesign for the insights they brought to the development of Tiles Cards and to NTNU Technology Transfer for their feedback.





nice

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