Which are the STEAM-Lab tools?

Technological equipment mixing FabLab, MediaLab and UserLab tools

Playrooms and games, animals and plants, wood and nails... must take their place side-by-side with books and words

Angelo Patri (c.1920's)

STEAM-Lab Tools Map

Furniture/tools for the Test and Observation corners

Guides/protocols to create "products" in the didactic units with users (students)

Design Thinking Protocol <

Test Protocol: includes previous steps (user selection, accessibility criteria), data collection (inspired on "Thinking aloud protocols" and observation), data analysis more complete UserLab coogle here

Inspired in USER-Lab equipment

Guides to evaluate the user experience in MEDIA-Labs

Guides/protocols to evaluate the "products" of the didactic units with users (students)

Photo shooting: photo cameras, smartphones...

Photo: Gimp, Photoscape (Photoshop)...

Design & Infographics: Canva, Inkscape (Illustrator)...

Sound recording: recorder, smartphones...

Sound Editing: Audacity...

Podcasts, Radio...

Video filming: chroma, lighting focus LED, video cameras, smartphones...

Video editing: MovieMaker, iMovie, OpenShot, Mobile Apps...

AR/VR Mobile Apps: Aurasma (app), Science AR (app), Wikitude (app), Google Lens, Google AR&VR, AR Flashcards

QR Codes

TimeLines & Mental Maps: coogle.it, Miro, Xmind, Padlet...

Interactive Maps: Google Maps, Google Earth, Mobile History

Subtractive 2D Creating Physical Elements more complete Fab-Lab coogle here Inspired in FAB-Lab equipment Electronics and Programming Technology in a STEAM-Lab OTHER more complete Other Elements coogle here Image Sound Inspired in MEDIA-Lab equipment more complete Media-Lab coogle here Video software list here (points 2 and 5) Augmented/Virtual Reality AR/VR

Additive

3D Printing & Design

Tool bench: saws, hammers, screwdrivers, pliers, drills, sewing Expendable materials: carton, wood, recycled materials, Construction kits/materials: Lego, Make.do, Straws&Connectors... Electronics equipment: electronic components such as LEDs, cables, resistances, motors, and protoboards, batteries, welding stations, multimeters, MakeyMakey... Microcontrollers: Arduino, Micro:bit (and online simulators)... Visual programming: Scratch, MakeCode... Text Programming: Python, HTML... Robotics kits: Lego Mindstorms, Lego Wedo, mBot... Share: projector, whiteboard, cork panels, bean bag chairs... Work: computers, Wi-Fi connection, sockets, workbenches... Artistic elements: pens, cardstock, post-its, brushes&paint... Store: cabinets, shelves... Collaborative online spaces, documents, boards... Data collection&Analysis: gforms, gsheets, Excel... Text Processors, Presentation tools... Websites creation: blogs, documentation, portfolios...

3D Design software: TinkerCAD, Sketchup, BlocksCAD, ZWCAD, (AutoCAD)

3D Printing software: Cura, Simplify 3D...

3D Printers

3D Scanners

Vinyl cutter

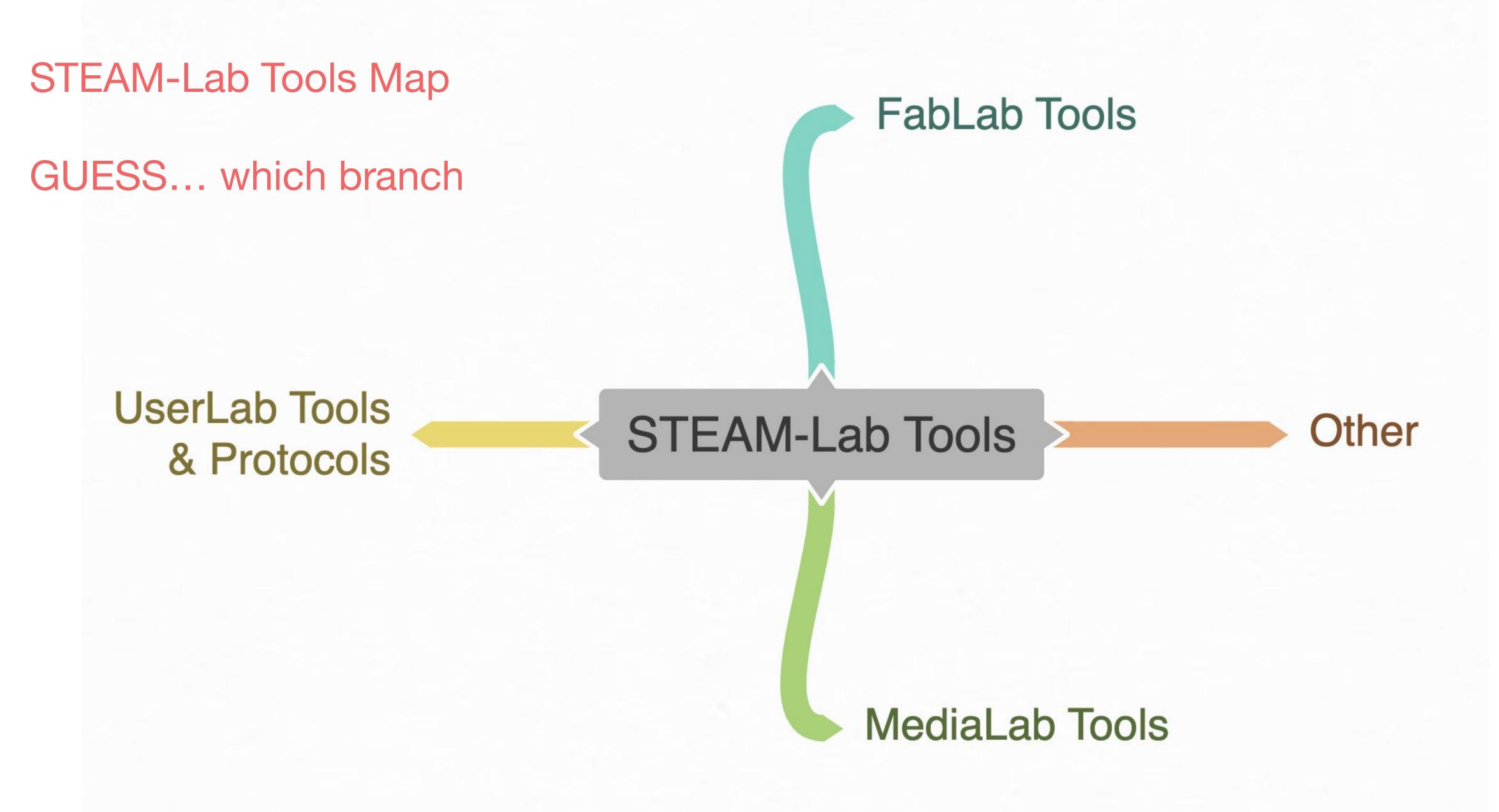
Laser cutter

machine, silicone guns...

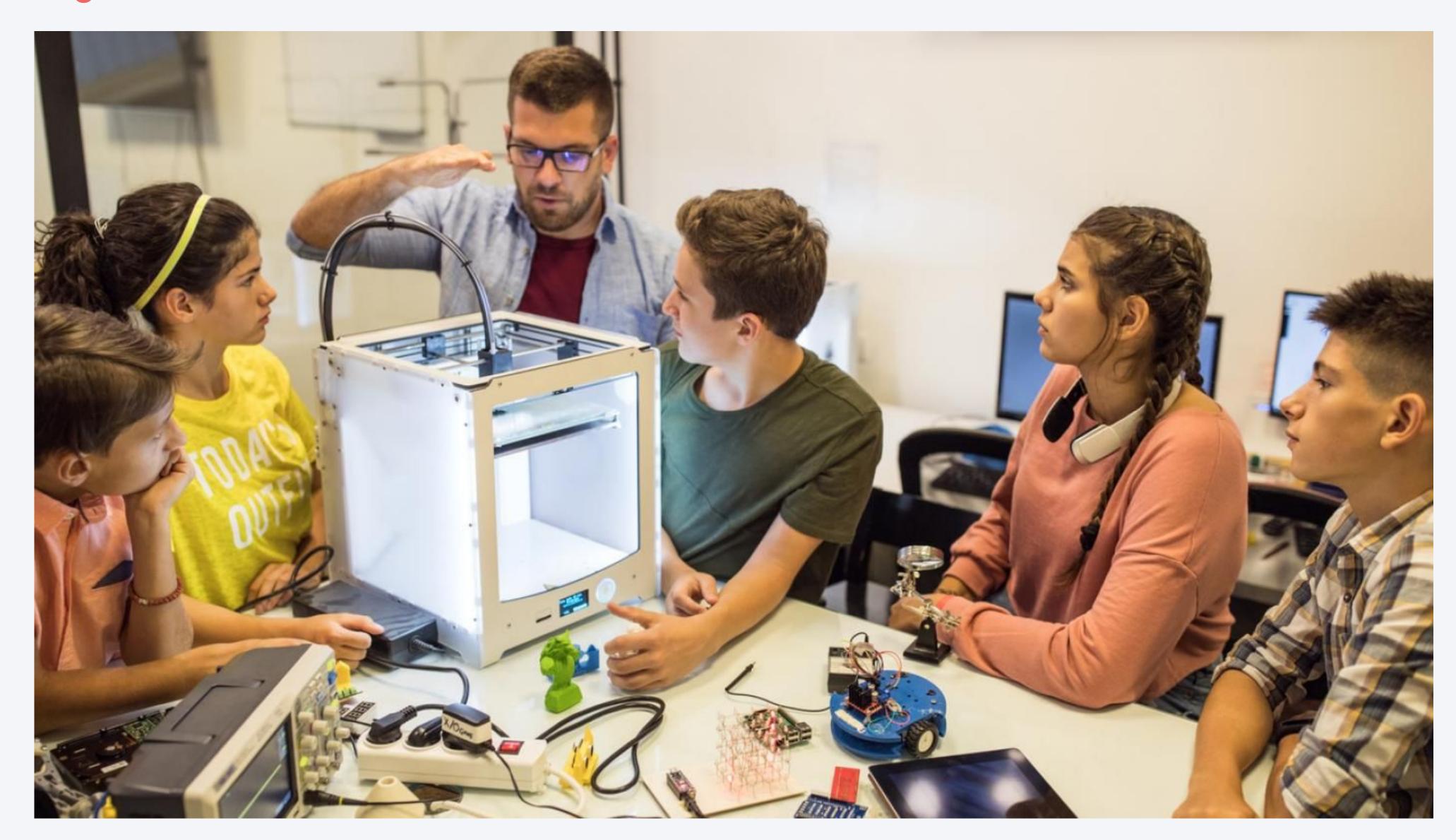
Physical

Virtual tools

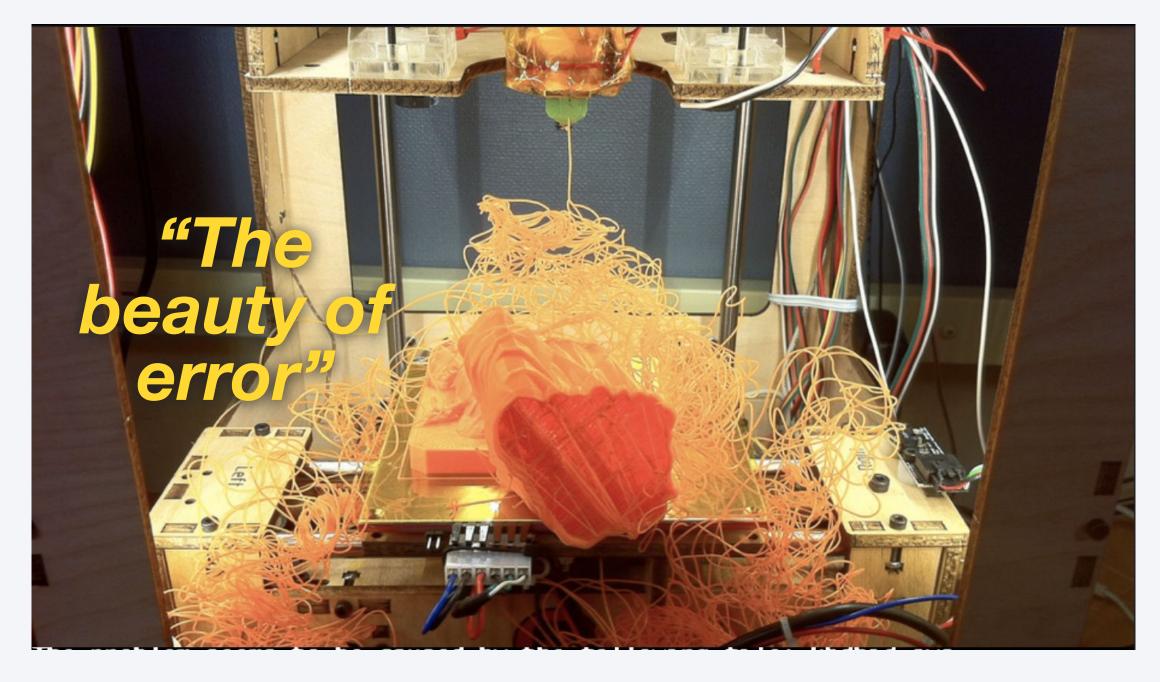
elements/spaces

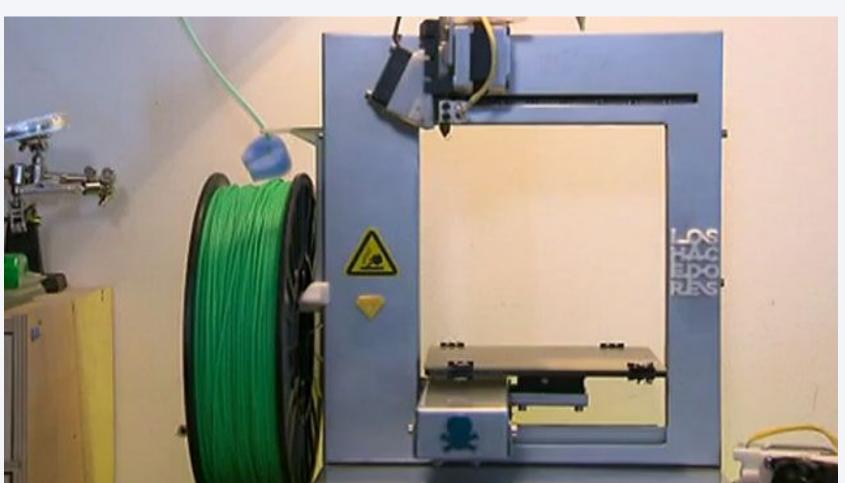


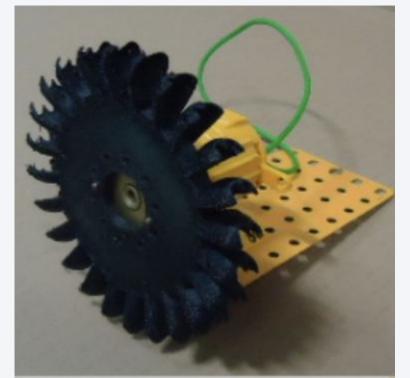
GUESS... ¿name and branch of this tool?

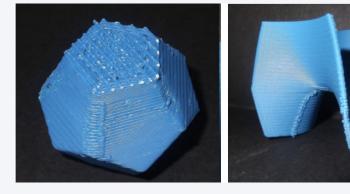


3D Printers



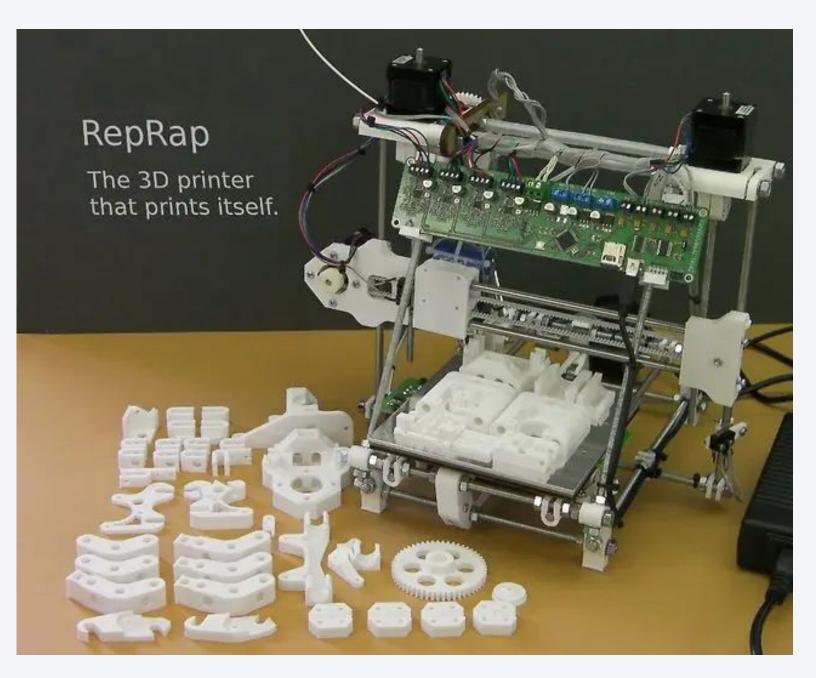




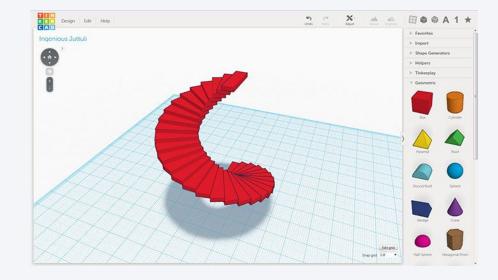


https://www.gov.uk/government/publications/3d-print ers-in-schools-uses-in-the-curriculum

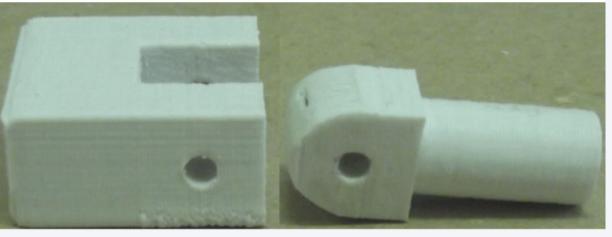




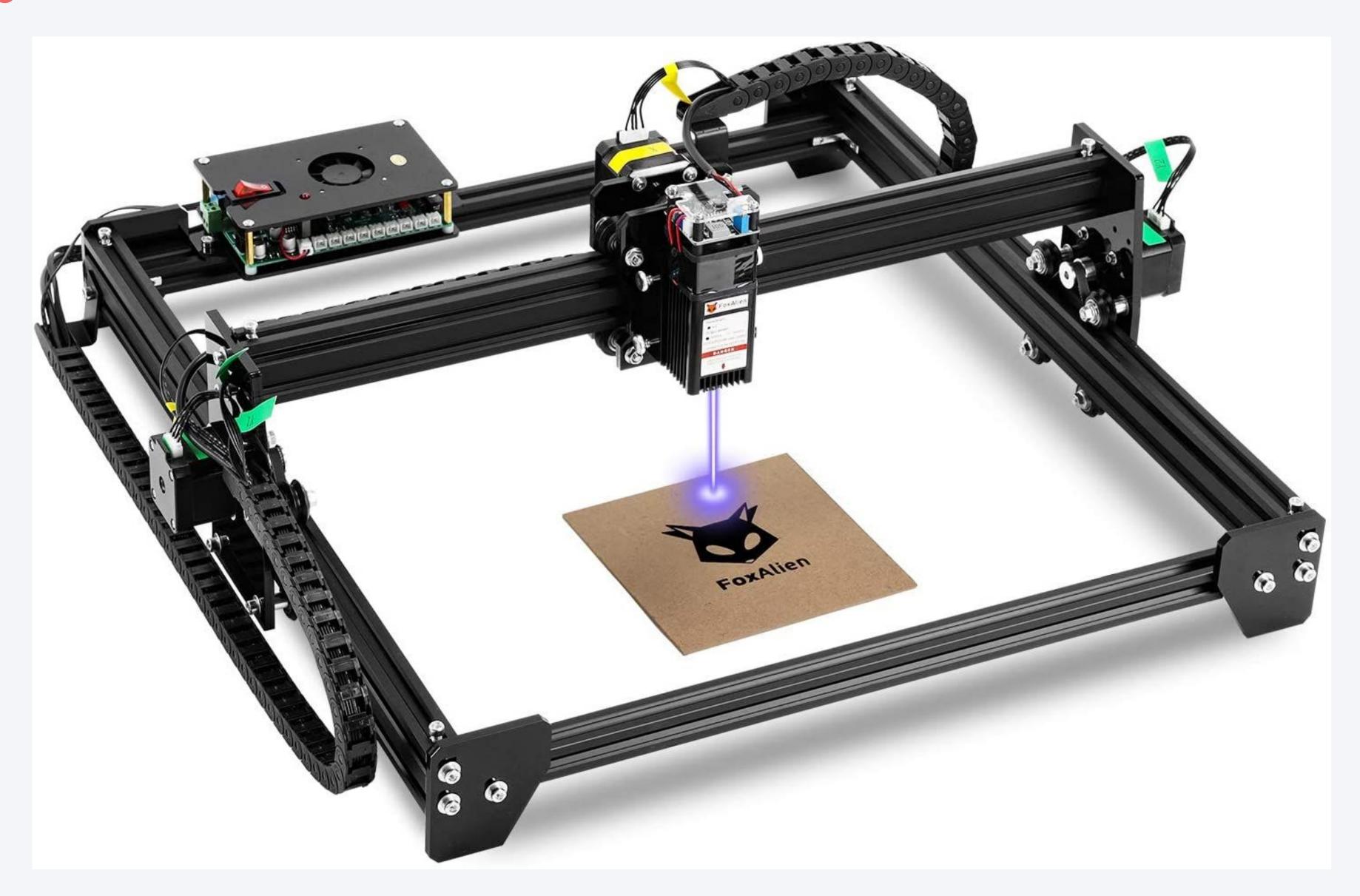
Source:https://reprap.org/wiki/RepRap/es



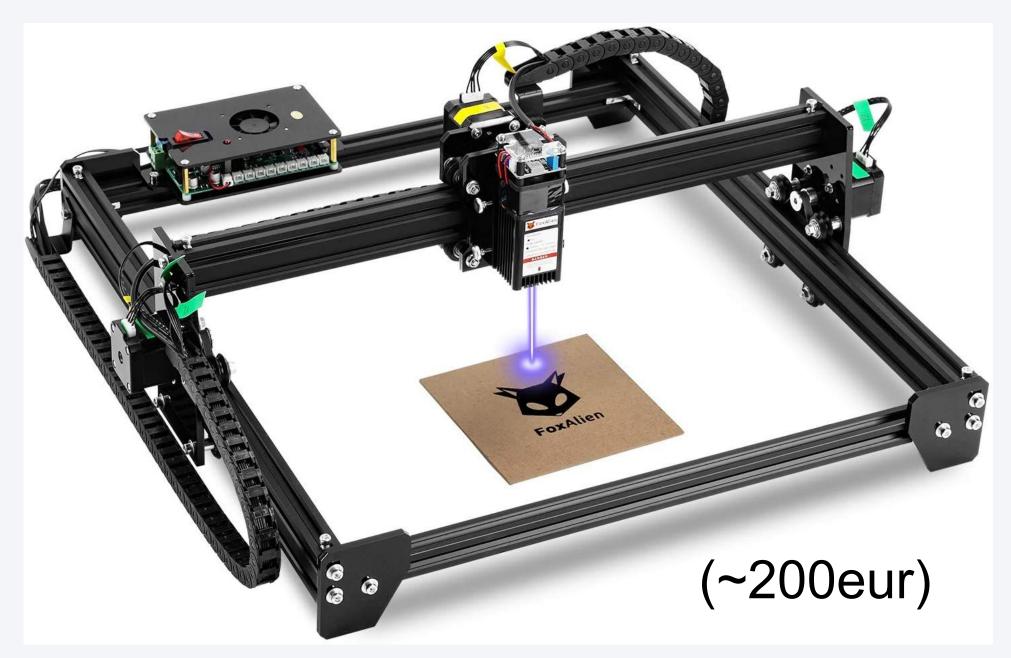
https://www.3dnatives.com/en/3d-s oftware-beginners100420174/



GUESS... ¿name and branch of this tool?



Similar Laser Cutters





A4 cutter K40 (360€)



Epilog Mini/Trotec Speedy 1000 (>1000eur)

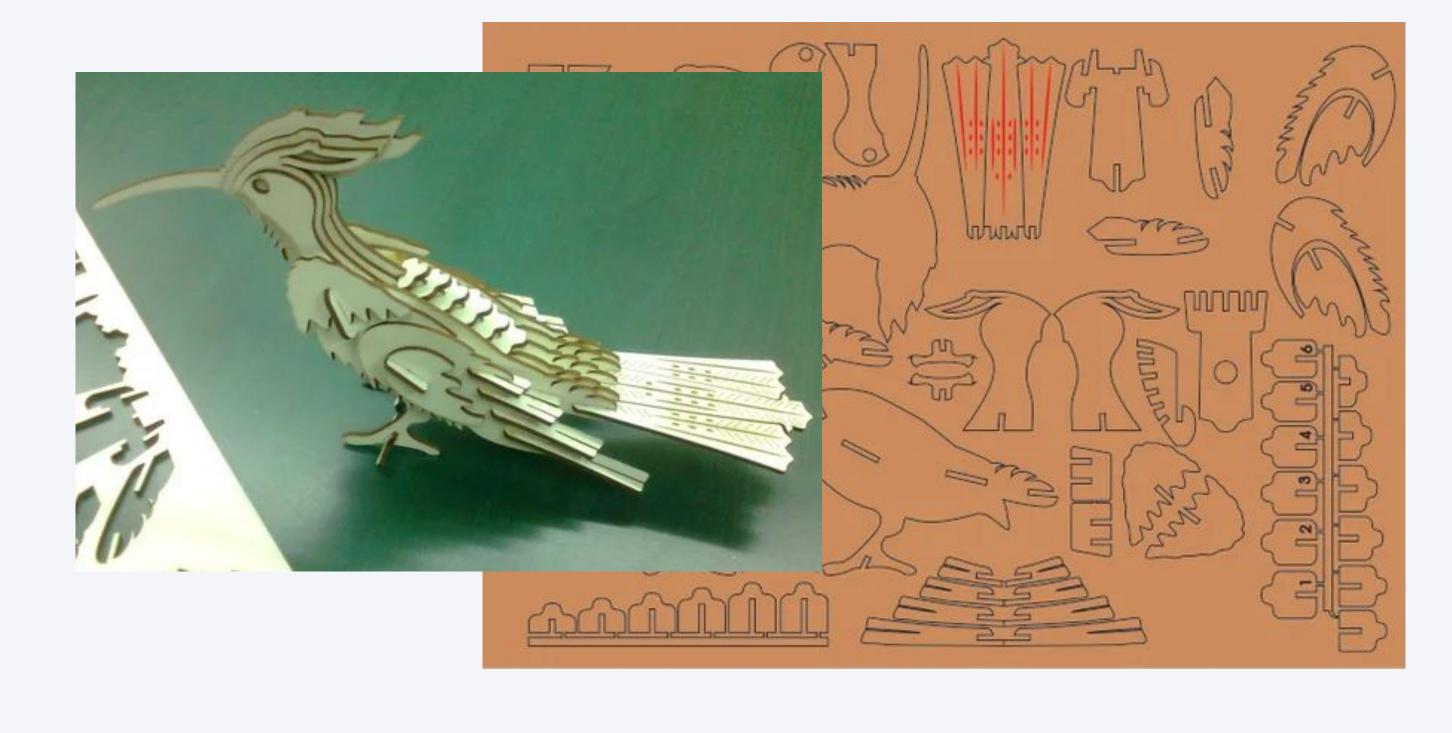


GCC LaserPro X252 63 x 45 cms 7995€

What can we do with Laser Cutter?



LAMINATED WOOD



PAPER



Source: Instructables.com

CARDBOARD



ENGRAVING



GUESS... ¿name and branch of this tool/material?



GUESS... ¿name and branch of this tool/material?



What can we do with cardboard, expendable materials, silicone gun...?



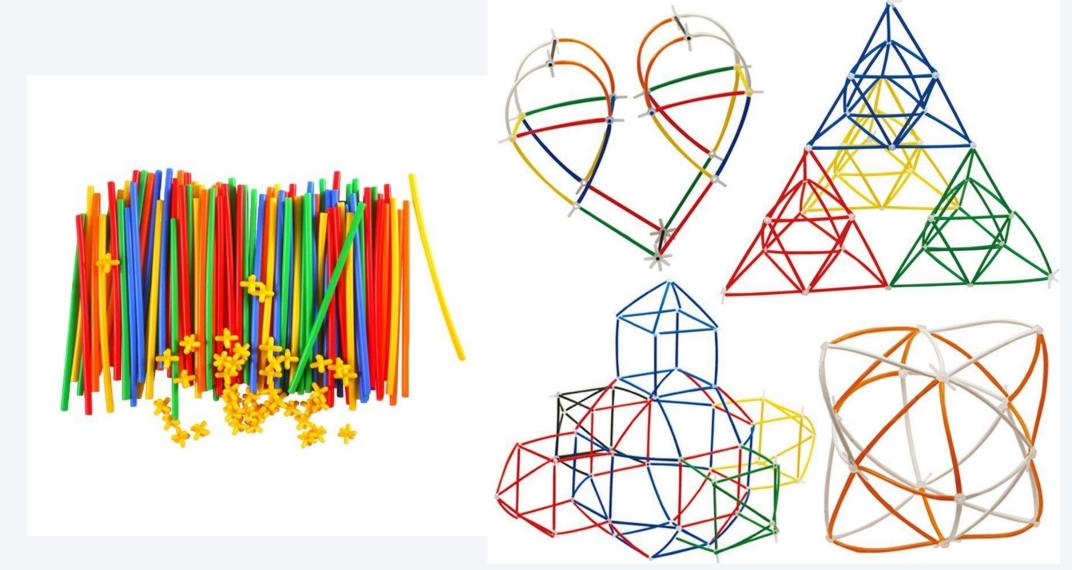


Source: https://www.polygon.com/gaming/2012/4/10/2938825/caines-arcade-video

Source: https://intertecheducation.edublogs.org/2018/08/16/still-inspired-by-caines-arcade/

Construction Kits

































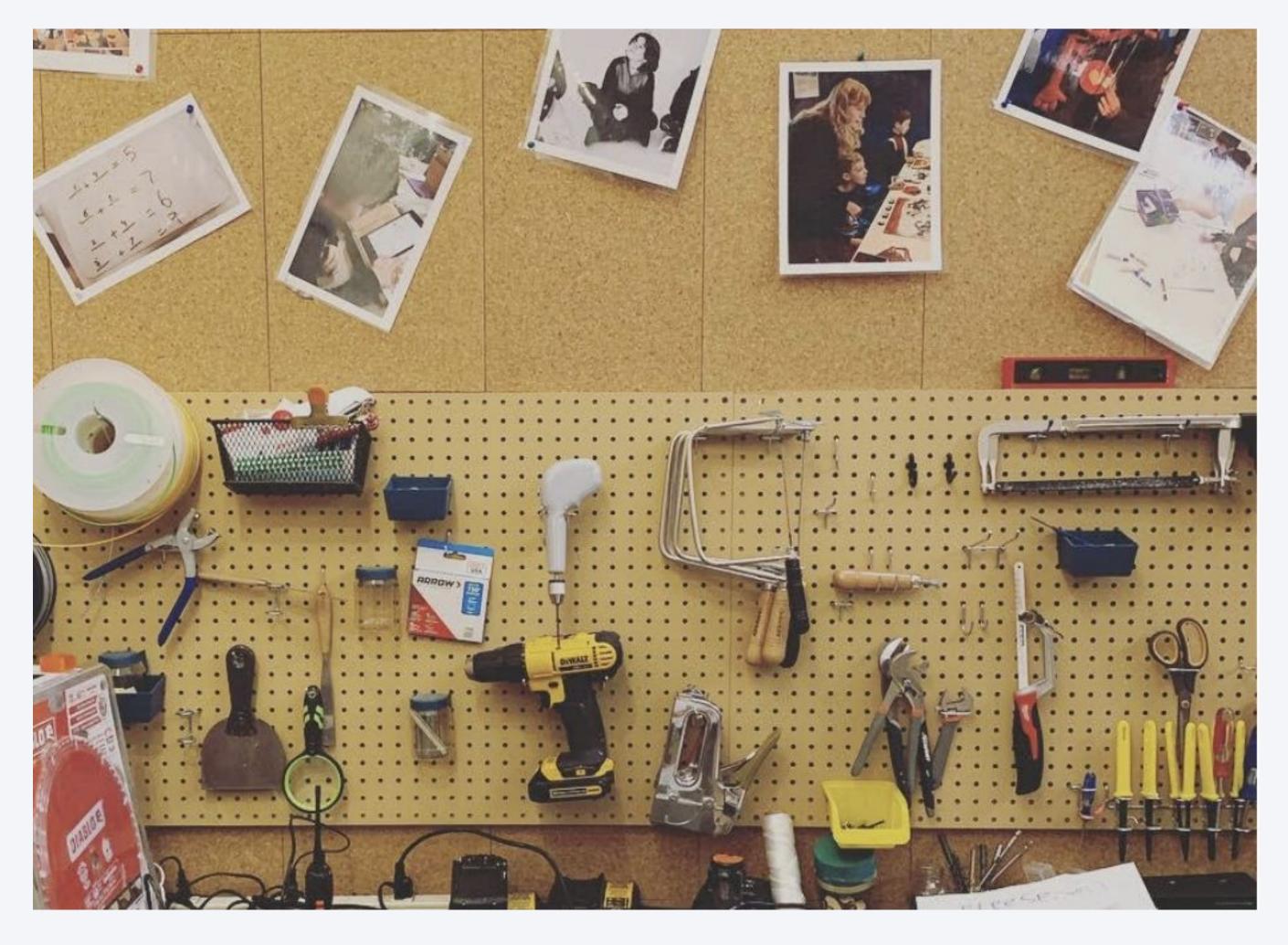




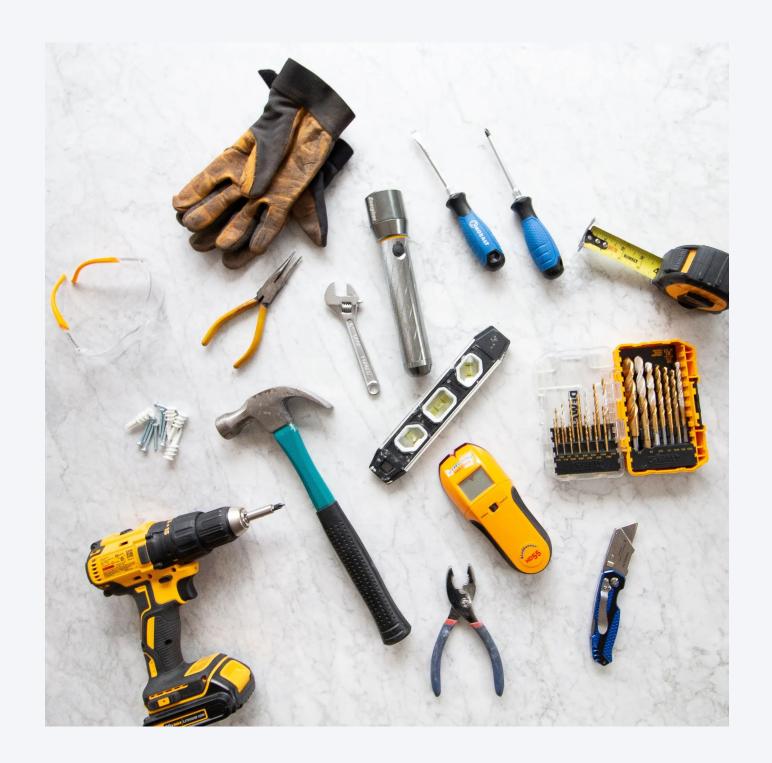
GUESS... ¿name and branch of this tool/material?



Bench Tools and Power Tools



Portfolio School





Sewing Machine FaLab Devon

GUESS... ¿name and branch of this tool?



Similar Vinyl Cutters

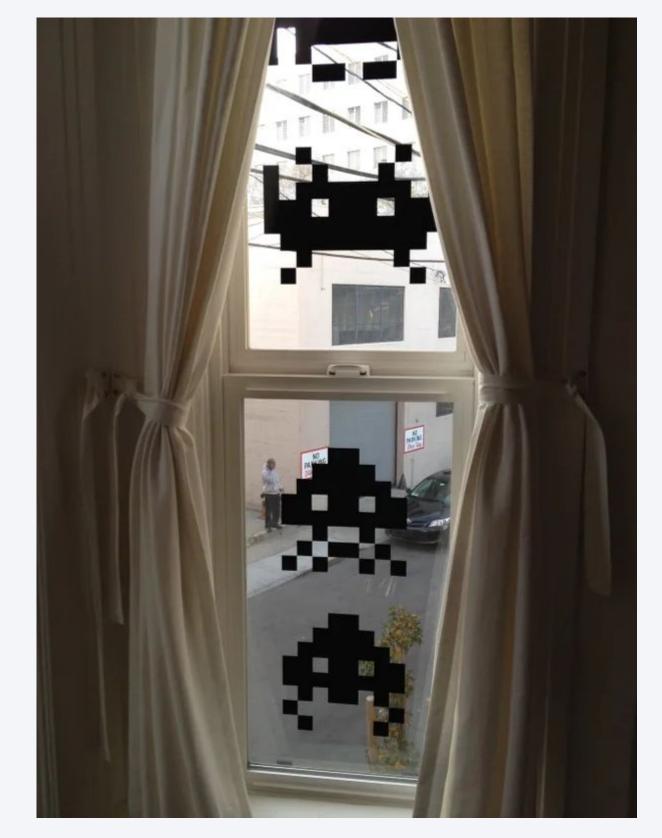


Roland CAMM (~1500eur)



Silhouette Cameo (~300eur)

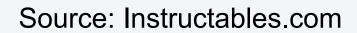
What can we do with Vinyl Cutter?







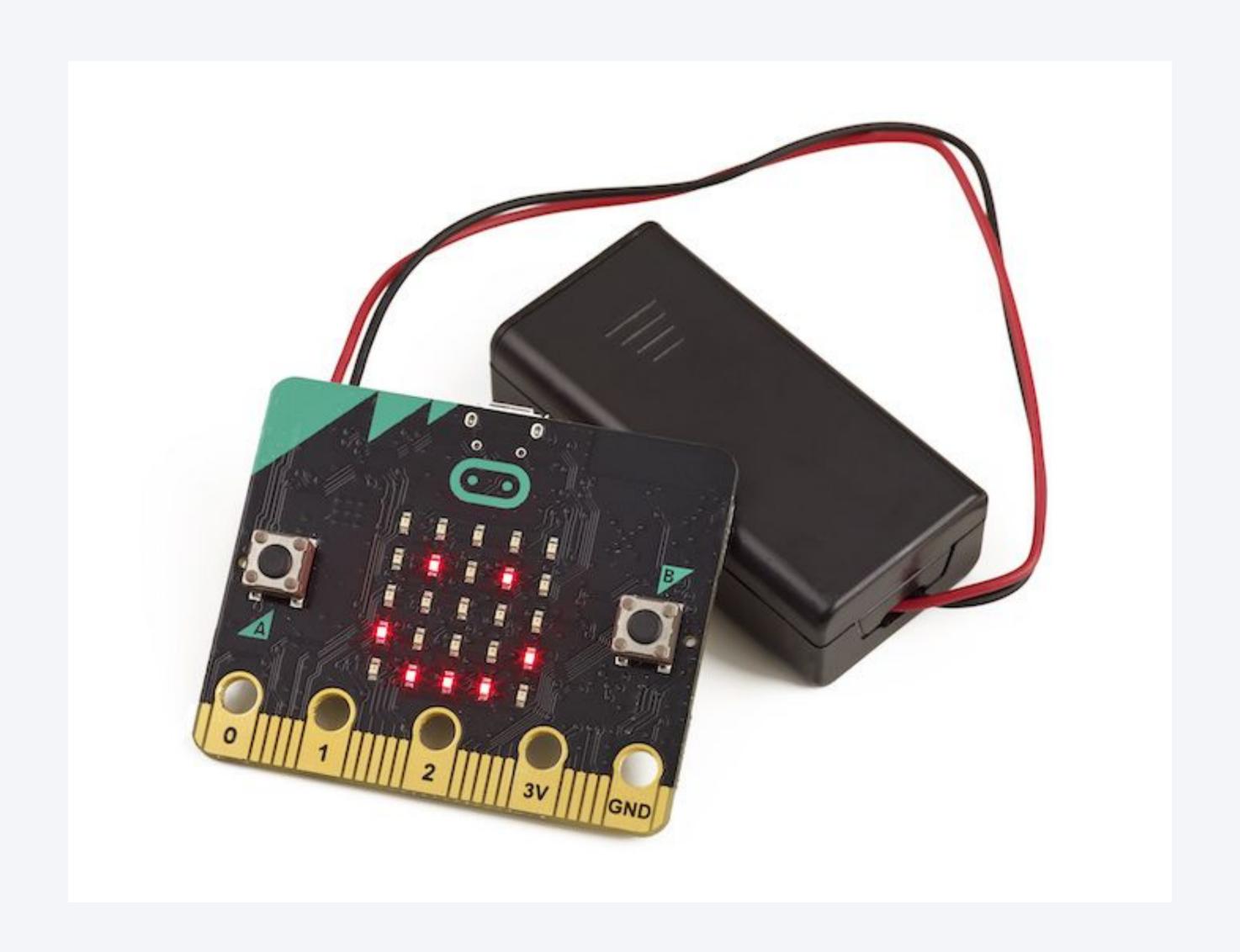




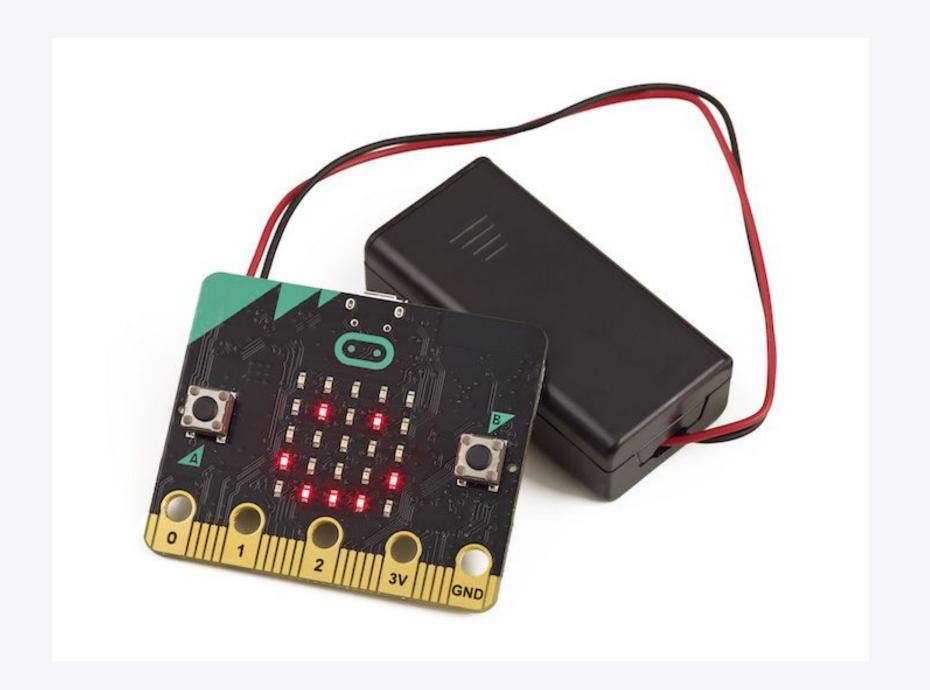




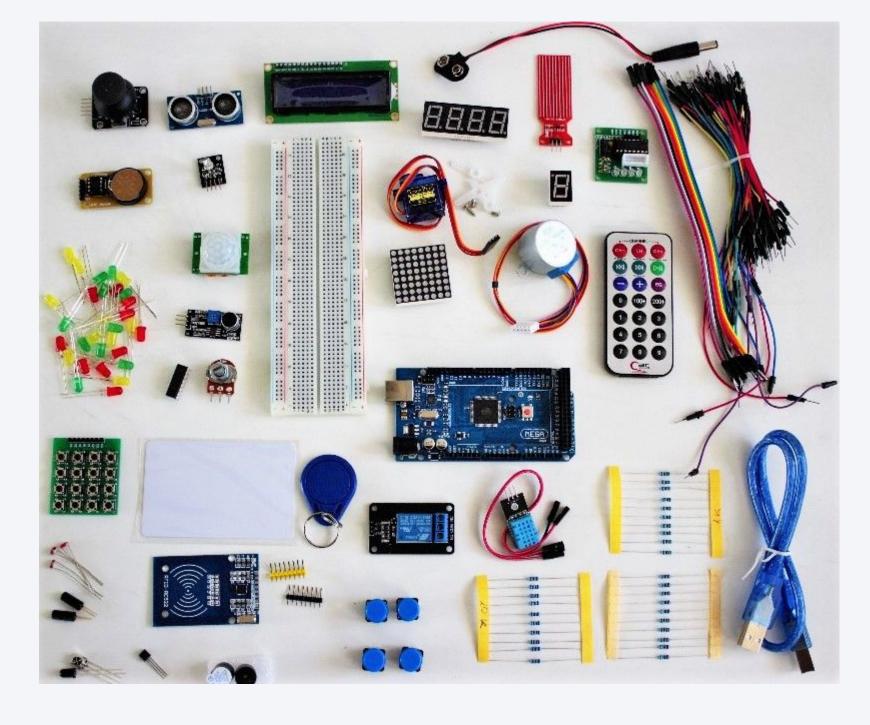
GUESS... ¿name and branch of this tool?

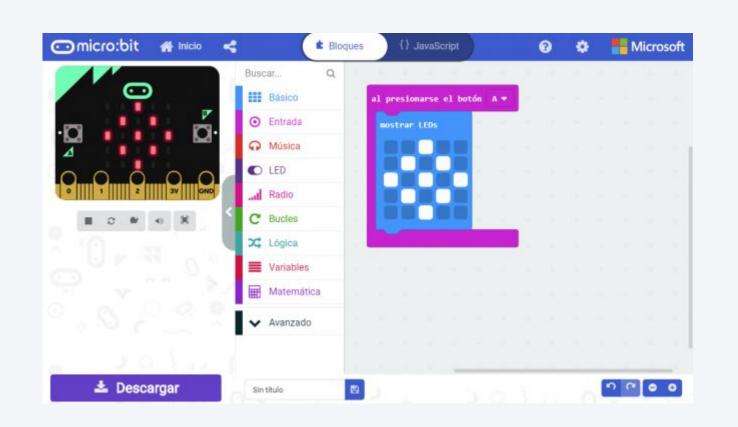


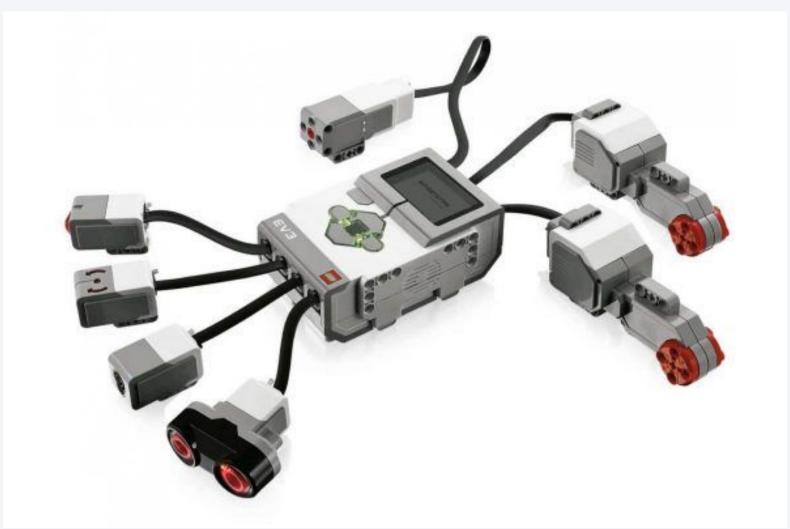
Similar Microcontrollers & other robotic kits





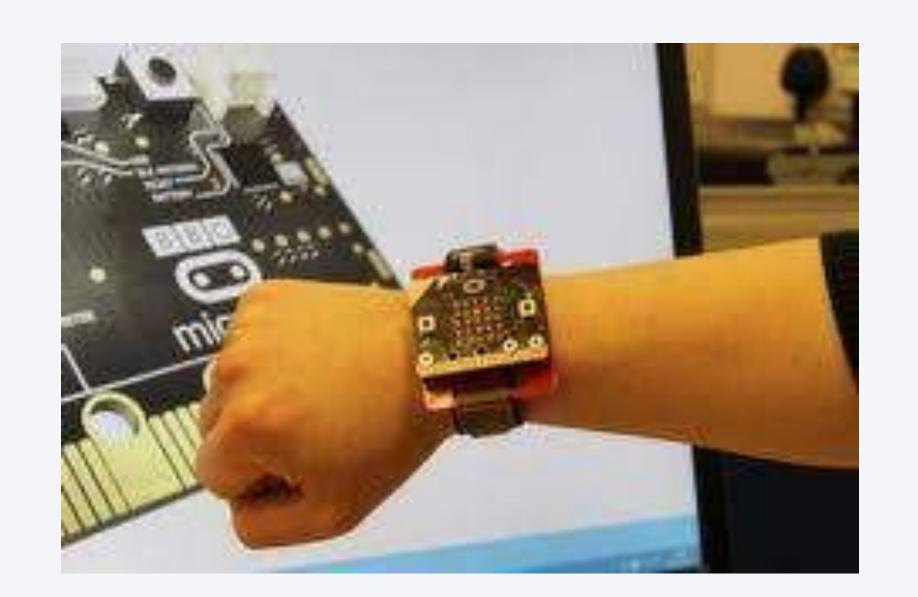


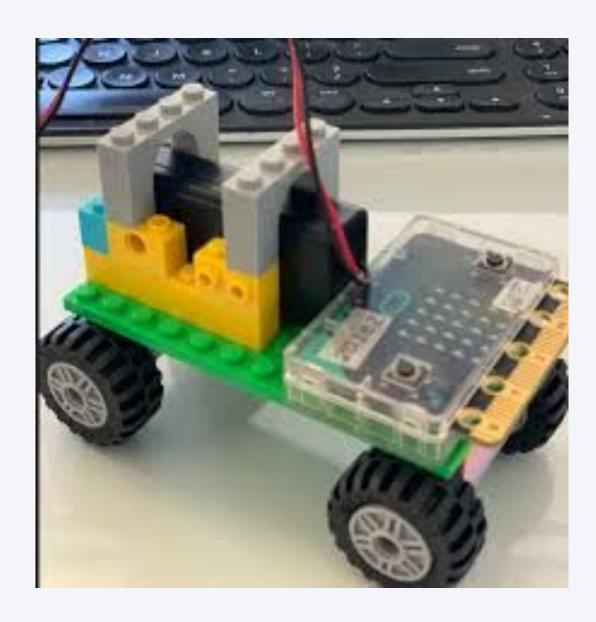


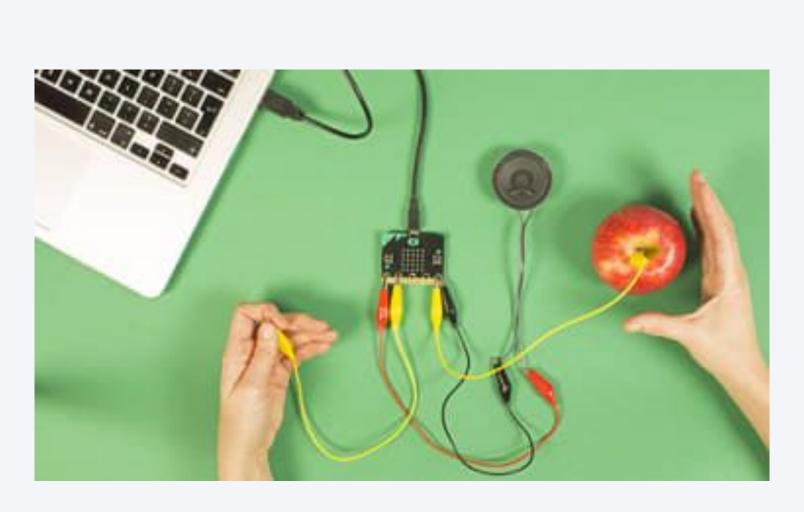


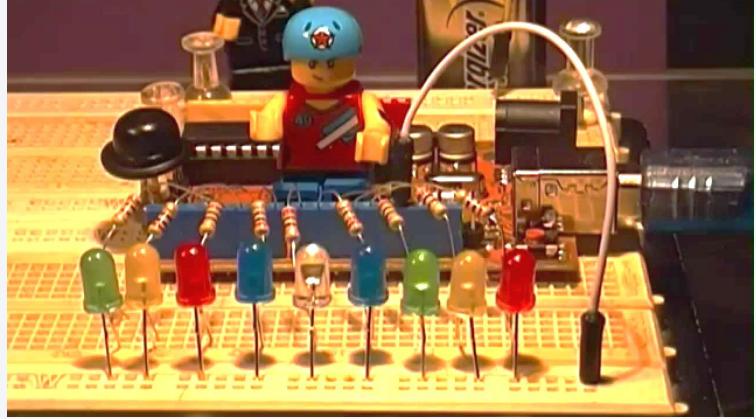


What can we do with Microcontrollers & robotics kits?











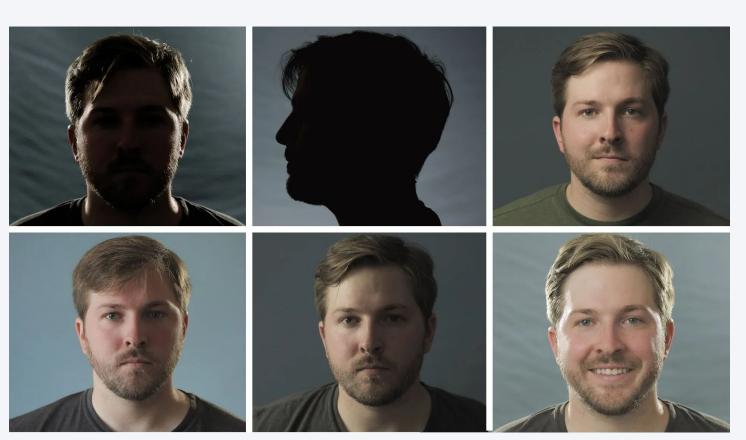


GUESS... ¿name and branch of this tool?



What can we do with Vídeo, Audio, Photo...?





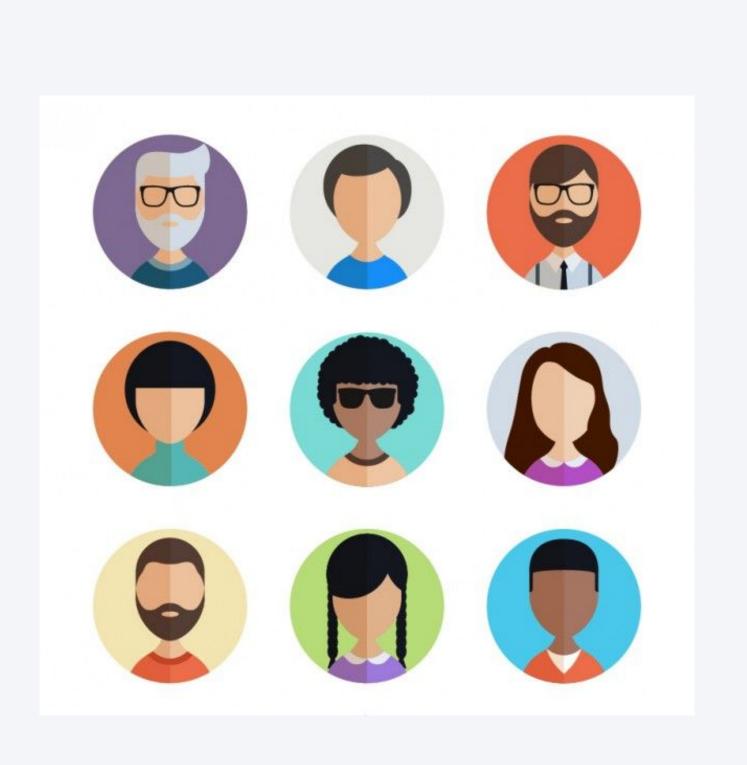


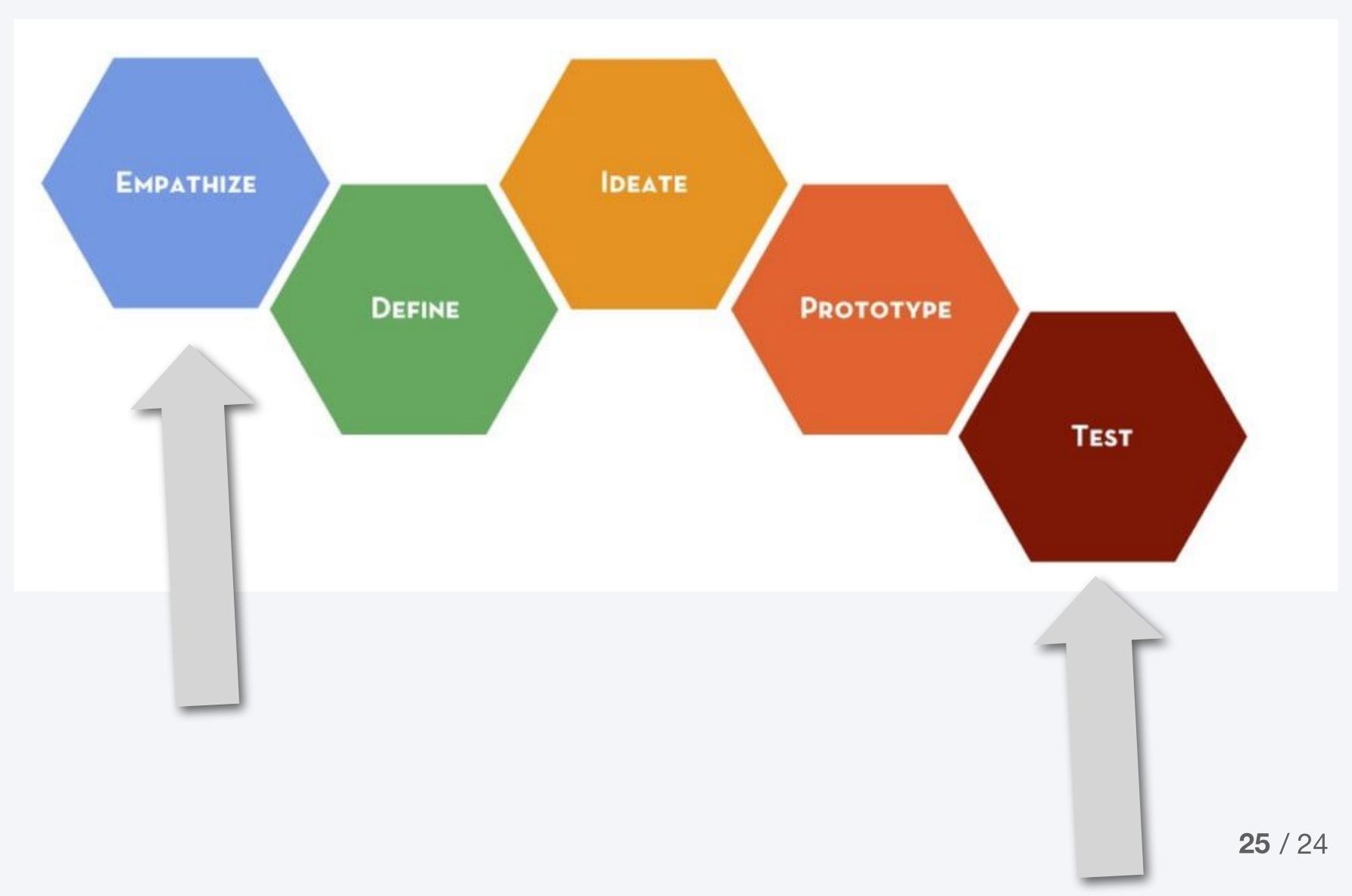


GUESS... ¿name and branch of this tool/protocol?

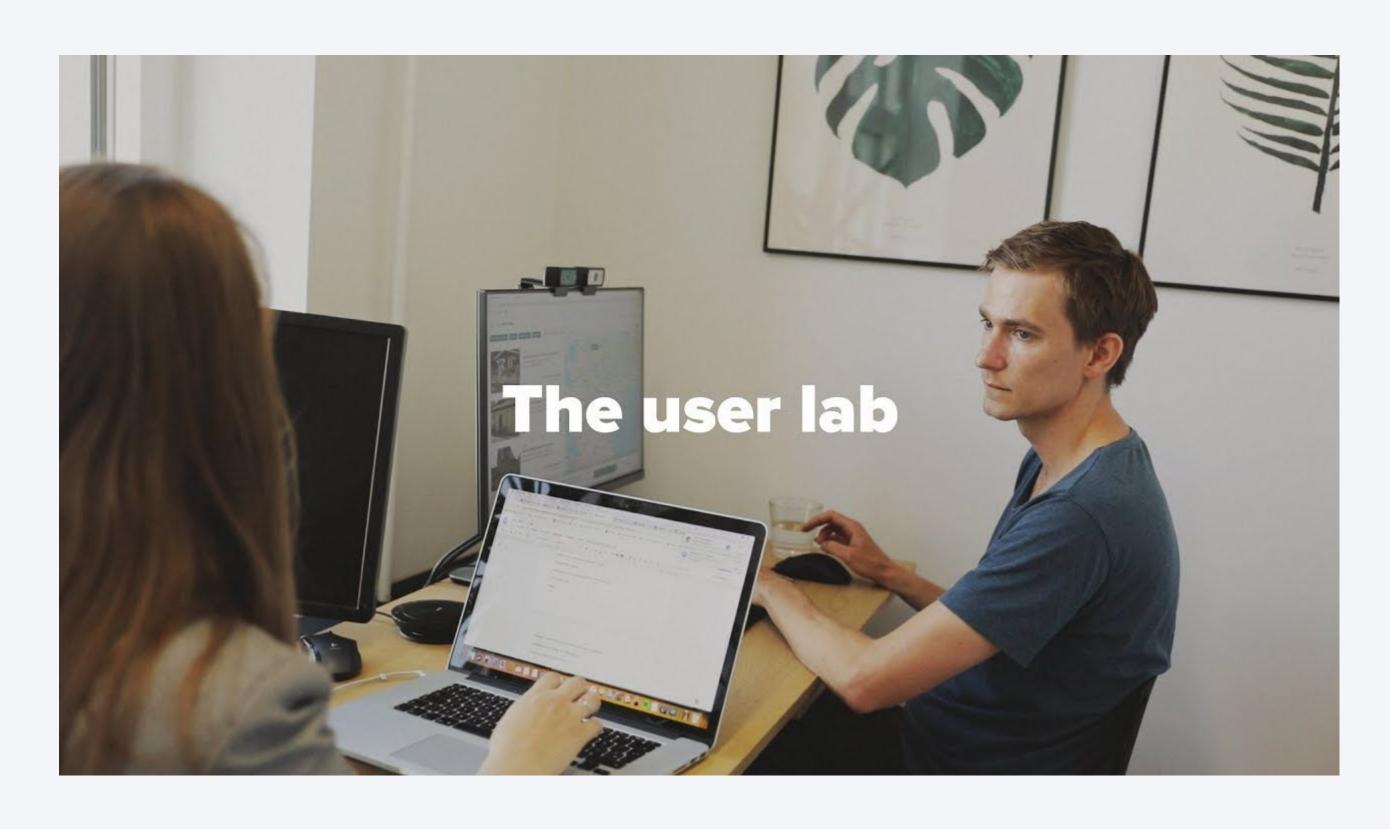


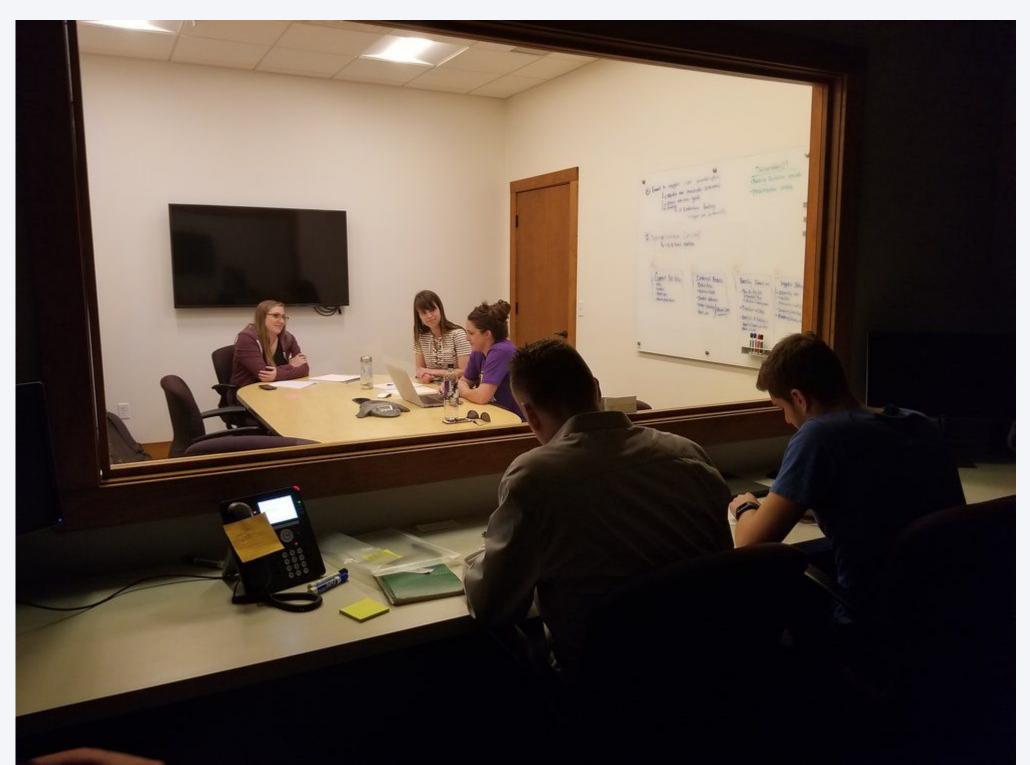
What can we do with User Testing protocols?





What can we do with User Testing protocols?





Before starting the next phase Why do we follow this stages?

ACTION PLAN: INTRODUCTION

✓ Our result:

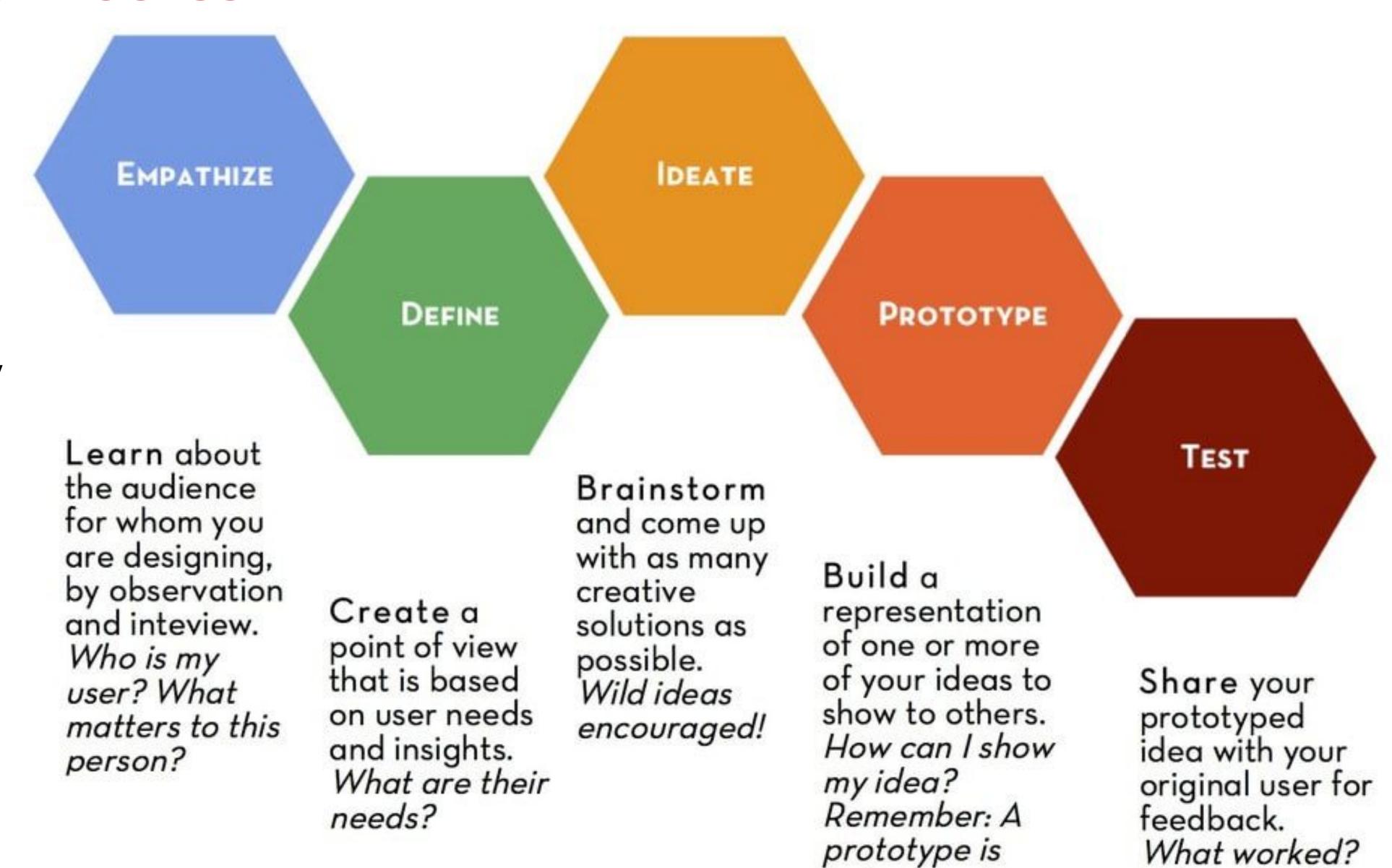
- Action Plan to create a STEAM-Lab in my School
- Next week we will share with colleagues in the training our Action Plan ("under construction")

✓ Our process:

- You've already done "Contextualize Phase"
- Inspired in Design Thinking

DESIGN THINKING PROCESS

- ✓ Developed since 70s at Stanford University (California, USA)
- Creative methodology to build products, services and innovation
- ✓ Iterative learning
- Human-centered design



just a rough

draft!

What didn't?

Source: https://dschool.stanford.edu/

DESIGN THINKING

Each stage has its own methods/ techniques

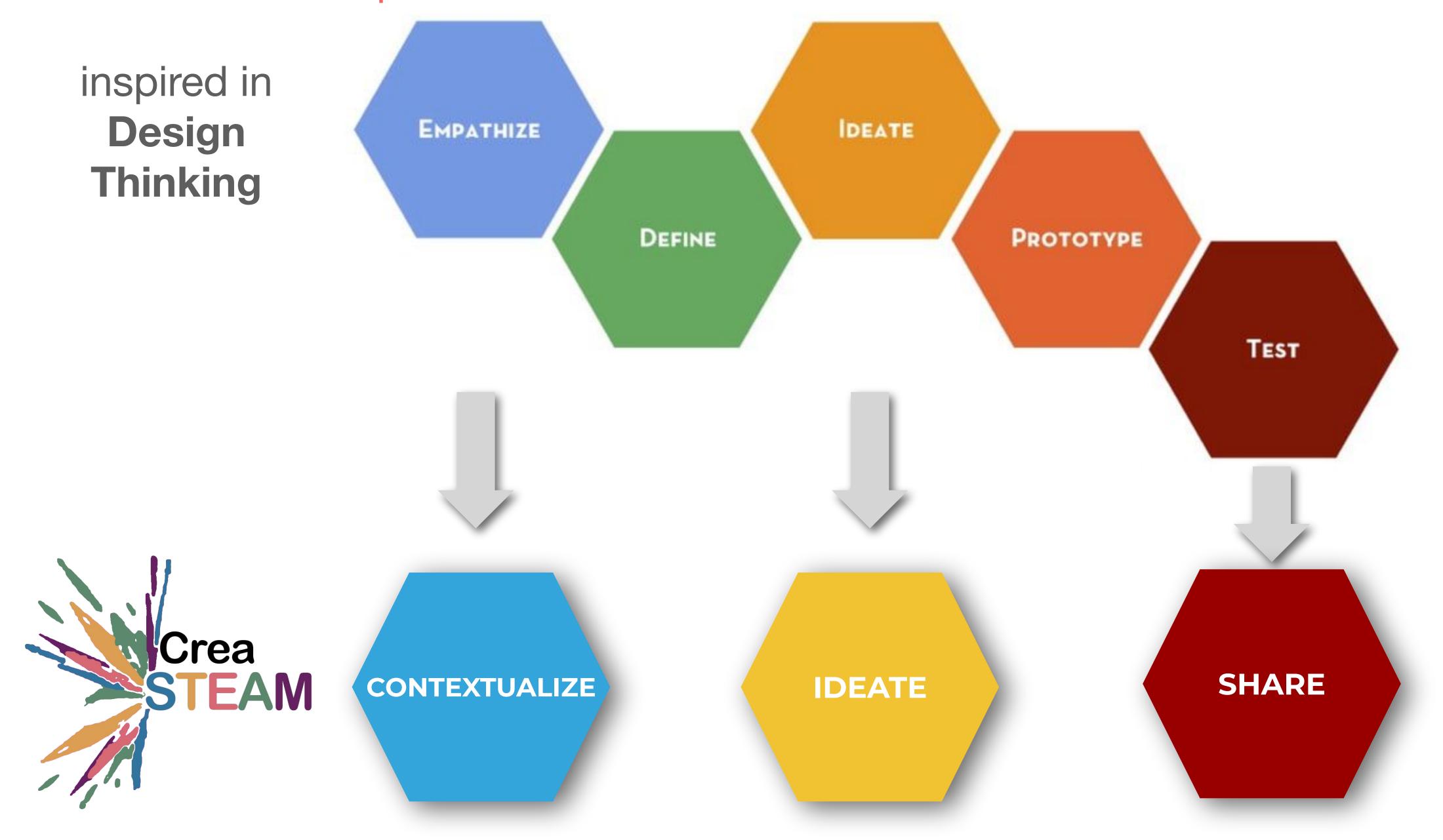
And his mindsets

Empathy Composite Brainstorm Looks Like/ **User Testing Equity Pause** Paseo Interview Protocol User Works Like Reflect Write Brainwrite Role Play **POV MadLib AEIOU Notice Tool** Rapid Testing Dyad Convo Constraints Prototyping **Immersion HMW** METHODS Constructivist Storytelling Listening Build to Levers Think Aloud Need Learn Statement Dyad **Empathy Map** Testing EMPATHIZE IDEATE REFLECT DEFINE NOTICE PROTOTYPE Build Relational Liberatory Trust Collaboration TEST Focus on Focus on **Bias Toward** Human Liberatory Focus on Craft Clarity Human Values Experimen-Values Collaboration Human tation Values MINDSETS Embrace Embrace Practice Self-**Bias Toward** Craft Clarity Complexity Complexity Build Awareness Action Practice Self-Emotional Awareness Practice Self-Practice Self-Notice Bias + Trust Build Awareness Awareness Relational Embrace Power Complexity Trust Bias Toward Define Bias + Embrace Experimen-Power Complexity Craft Clarity Show Don't tation Tell Build Build Share Don't Relational Craft Clarity Relational Sell IBERATORY Trust Trust DESIGN

Source:

https://nochesdemedia.com/2020/09/06/recursos-para-aplicar-la-metodologia-de-design-thinking-a-tus-proyectos-parte-ii/

Our process to create the "STEAM-Lab Action Plan"



Let's work on Ideate Phase

Let's start to design our STEAM-Lab Space

How to distribute the space...?

- noise / silent
- work / share / creativity / storage
- colors / areas / level of knowledge

