

# End User Development for Kids

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/by Jacob Nielsen

# My Two twists

How do I design  
and develop for  
Kids

How do I make it  
easier for Kids to  
become  
developers



# Name it

- Some examples of applications that have kids as the major user group?
  - Games -
  - Educational -
  - Health -
  - SoMe -
  - Other categories -

# How do I design and develop for Kids

- A few good Books and Sites
  - Designing for Kids: Creating for Playing, Learning, and Growing, by Krystina Castella
  - Design For Kids: Digital Products for Playing and Learning, by Debra Levin Gelman
  - Designing for Children's Rights, Design Guide Principles – [Link](#)
  - A Practical Guide to Designing for Children – [Link](#)
    - Has a great resource-list at the end!

# Some good pointers from literature

Castella, Krystina. Designing for Kids: Creating for Playing, Learning, and Growing (pp. 7-8). Taylor & Francis. Kindle Edition.

- Children and teens change quickly. Designers consider these changes and provide age-appropriate messages, materials, products, services and experiences. They are growing physically, cognitively, socially and emotionally.
- Children are dynamic, not static. Their brains and bodies are powered up for enrichment.
- Learning is attached to everything kids do. We continually question what the child will learn and build on for future learning. How will they be enriched?
- They are always experimenting and change interests frequently. We ask: how does our product, service, system or environment adapt to evolving interests?
- The user is often not the consumer. The designer considers multiple perspectives. Who will use it and who will buy it?
- Kids don't have the same life or contextual experience as adults. We are always questioning how much they already know and what skills they will be bringing to the topic.





# Some good pointers from literature (2)

Castella, Krystina. Designing for Kids: Creating for Playing, Learning, and Growing (pp. 7-8). Taylor & Francis. Kindle Edition.

- In research and testing, it is hard to get from them exactly what they are thinking. Younger kids cannot yet verbalize their thoughts. Older kids just may not tell you. To uncover insights we use multiple approaches.
- Kids are erratic and chaotic. You never can predict how they are going to interact with or interpret your project.
- Kids are usually up for a challenge. They thrive on a sense of accomplishment from taking it on and succeeding or just trying.
- Kids love repetition. They can do things over and over again when most adults might get bored.
- Many things are new to them. There are a lot of first-time experiences throughout childhood.
- Safety standards are tight. An extra level of effort needs to be addressed to satisfy safety requirements.







# Some good pointers from literature (3)

- Conduct ethical research with children to learn about their views and experiences.
  - Make sure to get both the guardian's and the child's consent to participate.
  - Make sure children's input is implemented in your design.
  - Children's friends, parents, teachers, and communities also care about your product or service, so include them in the process as well.
  - Get input from experts in children's well-being, needs and age specific development, and include up-to-date research from a range of disciplines.
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# Some good pointers from literature (4)

- Children need products and services that do not discriminate against characteristics such as appearance, gender, sex, age, ability, language, ethnicity, nationality or socio-economic background.
  - Support diversity, accessibility and inclusion in all aspects of design, business and marketing practices.
  - Expect children to use your products and services in unintended ways. Children might use your products or services even if they are not designed for them.
  - Make sure that children understand all the information that could have an impact on them. This includes providing terms and conditions and marketing messages in easy-to-understand language.
  - Consider multiple forms of communication (pictures, video, text, sound etc.) on multiple platforms to make information understandable and accessible to all.
  - Keep in mind that age, developmental stages, ability, culture and language impact children's understanding.
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# Some good pointers from literature (5)

- Children need to have freedom to experiment, take risks and learn from mistakes.
  - If mistakes occur, support the child to fix them, either by themselves or with an adult.
  - Encourage curiosity, and consider children's evolving capabilities based on age and development, personalities, skills and interests.
  - Offer children opportunities to acquire new skills and encourage them to take on self-driven challenges.
  - Design for children to be creators and contributors, not just consumers.
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# Debra Levin Gelman

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- children communicate volumes by how they play, what they choose to play with, how long they choose to play with it, and when they decide to play with something else. Yet they don't get as disappointed when something isn't working. They just choose to browse or play something else.
- Most importantly, we can't design for children without testing. Even better: bring children to co-design their digital experiences and bring parents or teachers to co-design reliable guardrails. With a fun, smart, and safe product, parents will spread the word about you faster than you ever could.

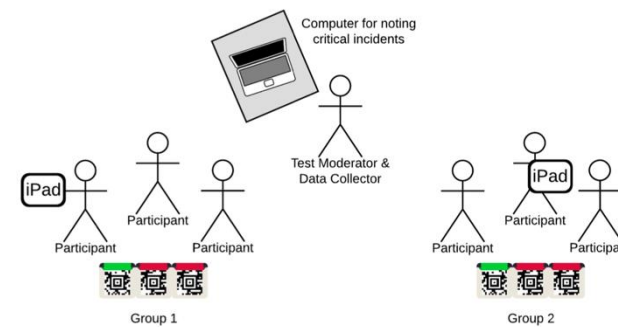
# Exercise (20 minutes)

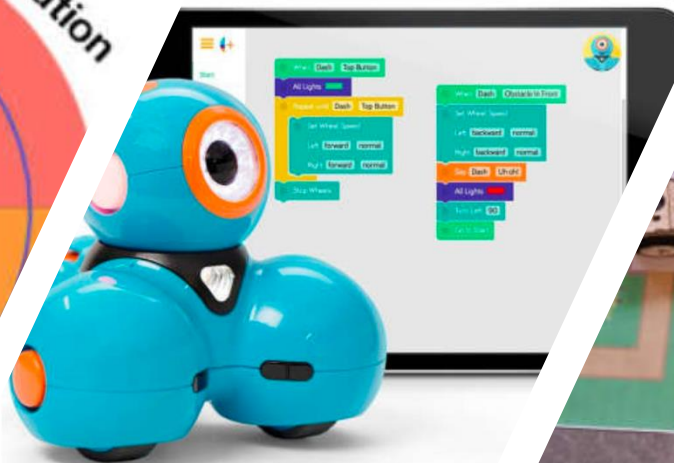
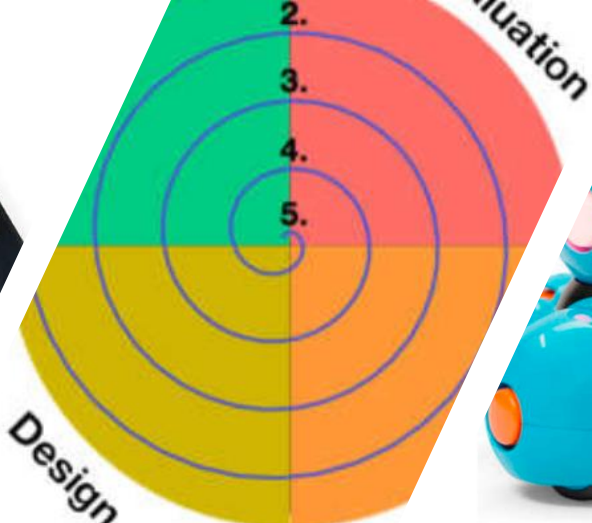
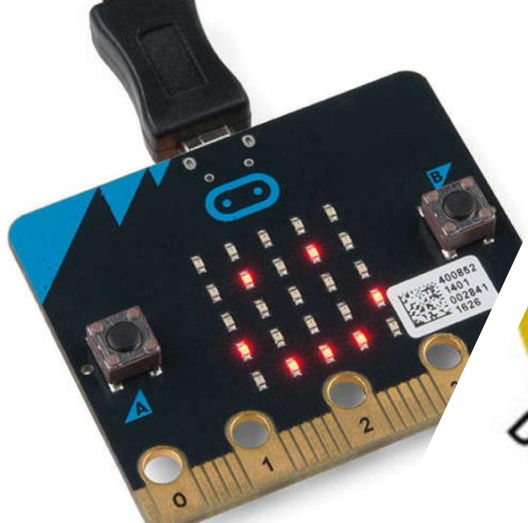
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- In groups of 3-4 students, use the previously mentioned pointers (or at least some of them) to
  - Give some initial guidelines for developing an app that teaches history to kids aged 8-10 years
  - The theme – Medieval Era: 500 AD – 1500 AD
  - Describe a methodology
    - Who will you involve
    - How will you do it – and what will you need to research first
    - How will you involve kids etc in the design process
  - Try and sketch a prototype screen interface that you could present to some kids to get feedback on

# A few examples of projects

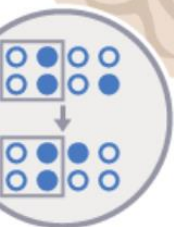
- Multi-User Tangible Programming With Augmented Reality





Computational thinking

Decomposition



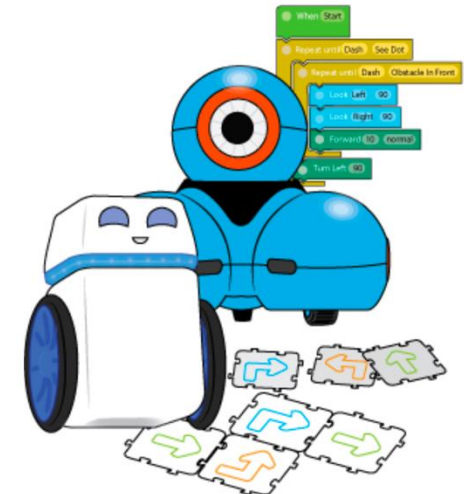
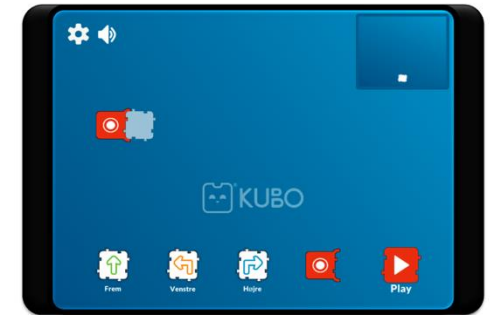
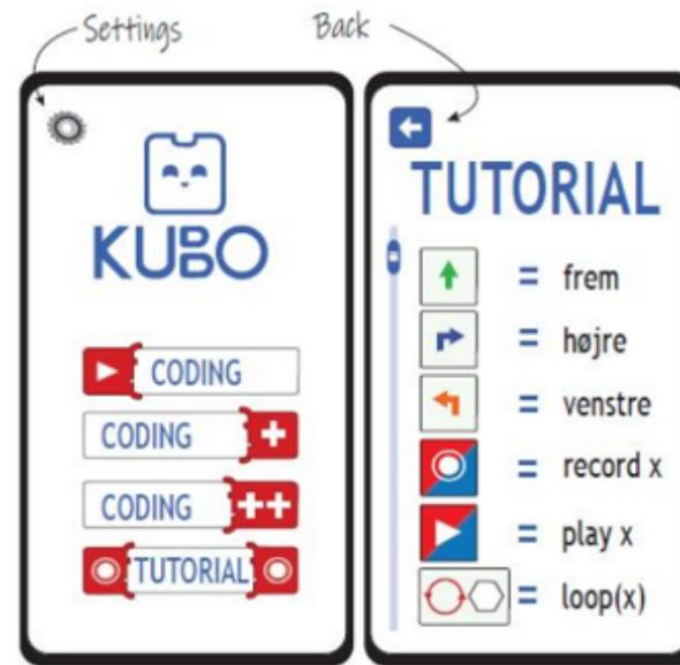
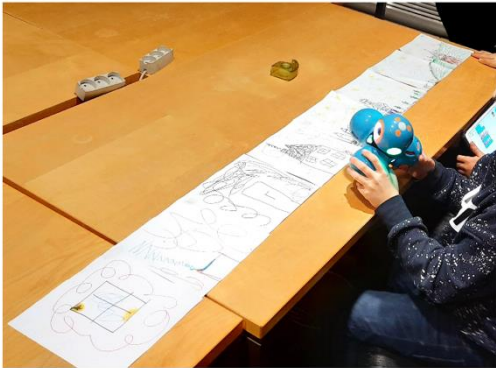
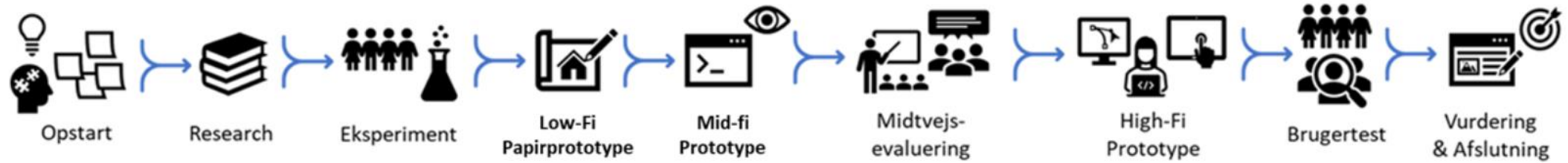
Pattern recognition



Udvælgelse og Udvikling:  
Teknologi og STEM-  
orienteret Undervisning i  
Grundskolen



# Utilization of tangible robotics as a fundamental learning approach for visual programming



# How to teach tech development to kids

- Many of the above design pointers can be reused.
- Why is it needed
  - The European countries are going to need 10.000.000 more ICT specialists before 2030, if we are going to be able to compete continually with Asia and USA on the tech markets
- It is something we have been doing in Teknologiskolen since 2015.



# Teknologiskolen Anno 2024

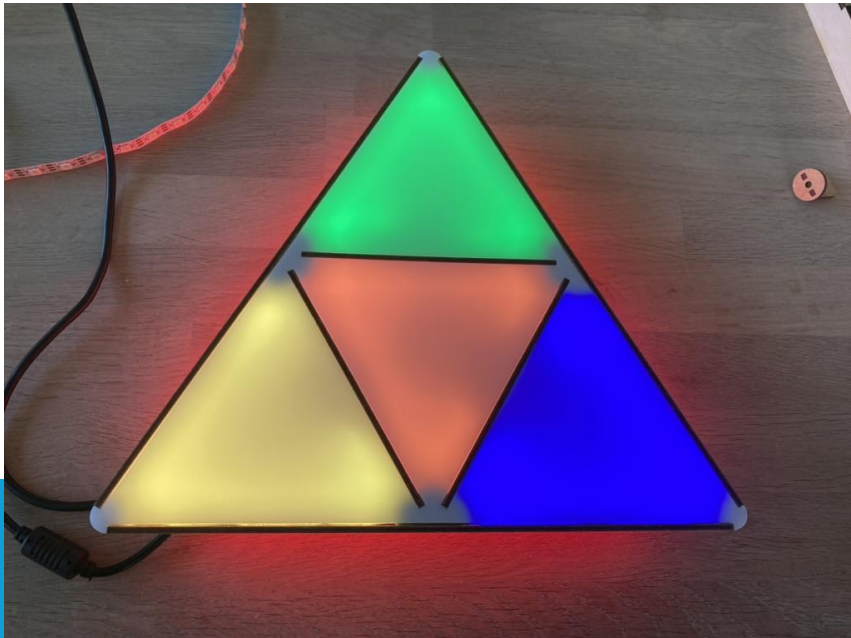
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A volunteer organization offering teaching in technology for kids and teenagers from age 6 to 18





# Teknologiskolen



Our focus is on technology of all kinds, although based in robotics, and we provide our participants the opportunity to build with and learn about technology.

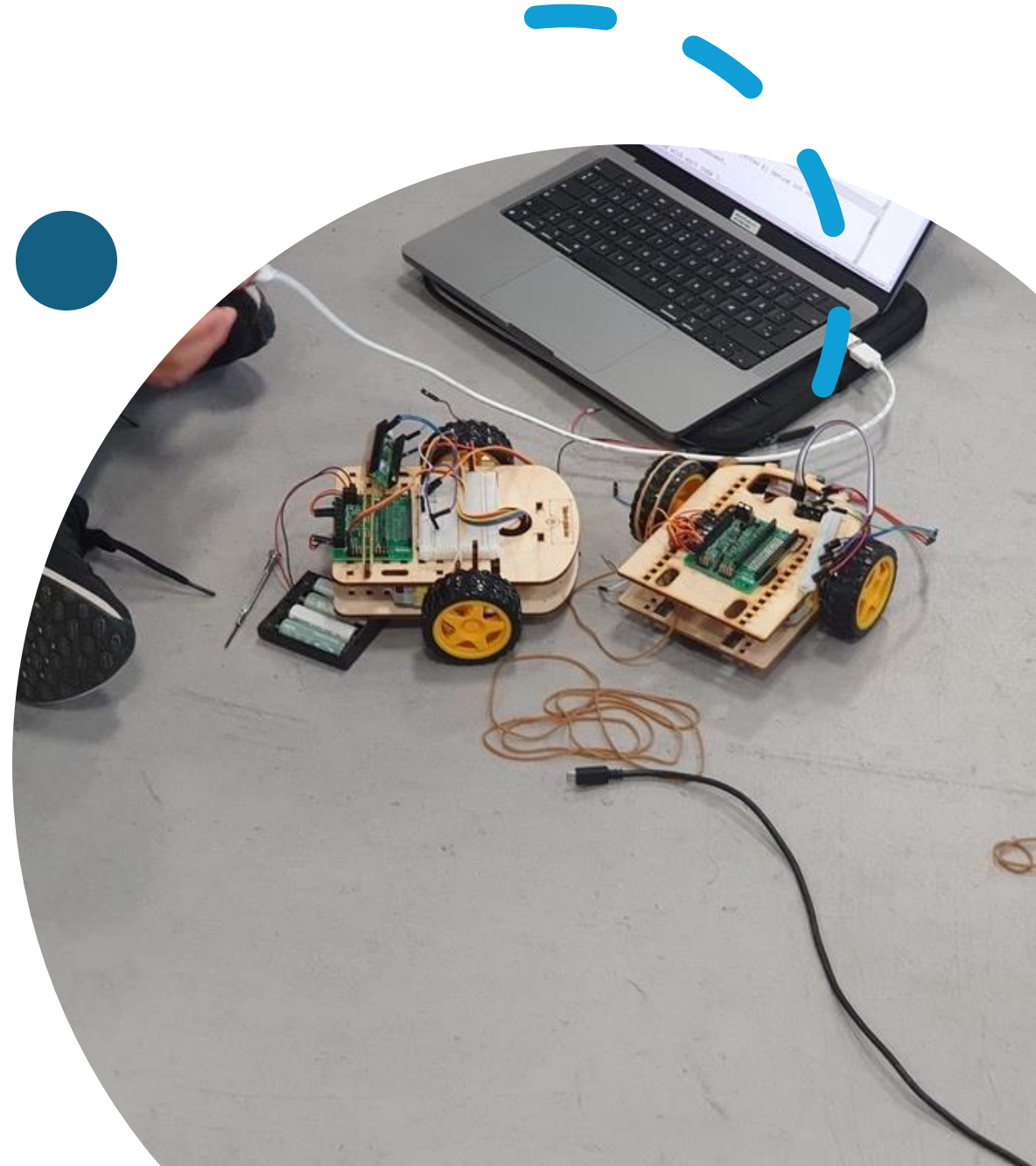
We consider our school an evolutionary design project, and from a research perspective we are aiming at eventually providing our participants with the best possible platform for learning how to create and explore technology.

We rely very much on project-based teaching and learning, where Seymour Papert's constructionism is inherent in the way we set up the projects, allowing the children access to building stuff from day one.

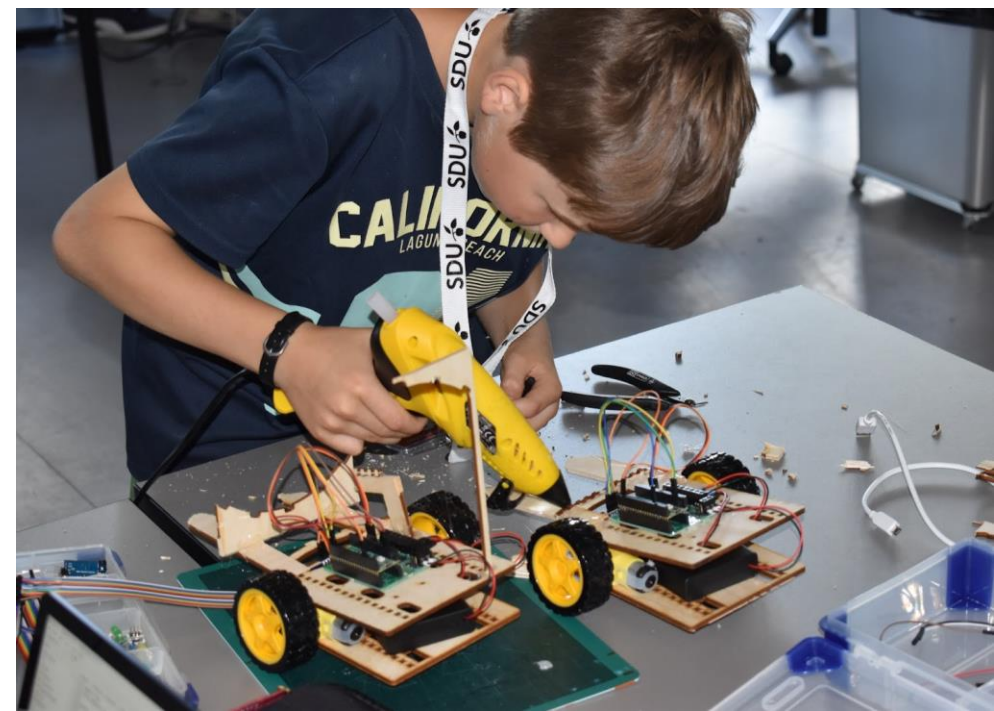
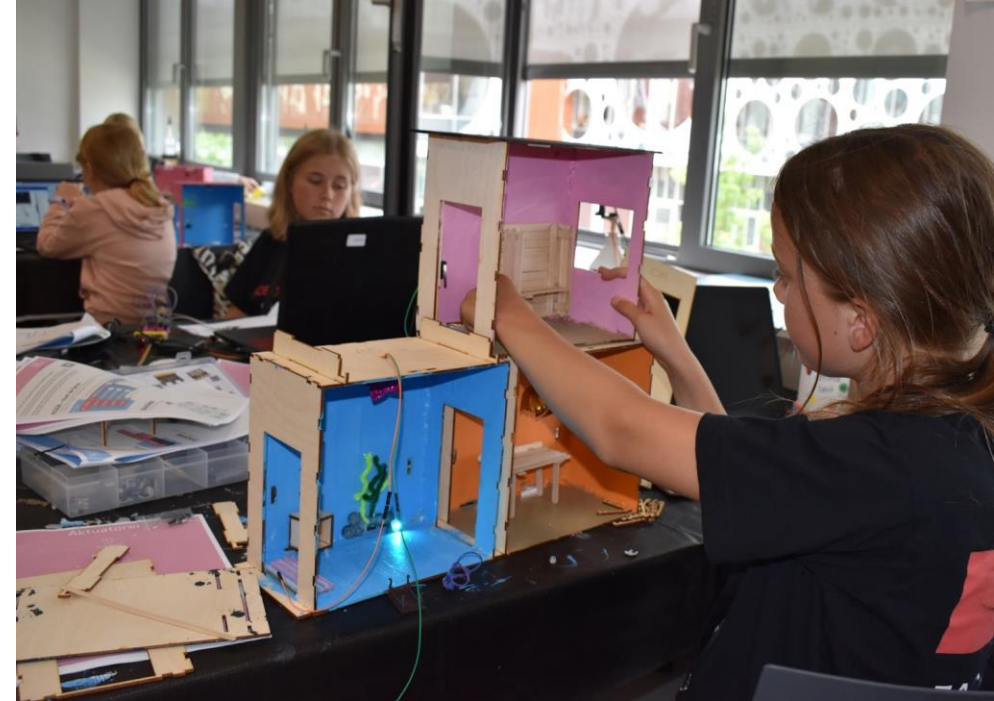
We are a non-profit, volunteer organization run by a board of 5 members and we currently have around 30 volunteers that help teach more than 100 participants in our 8 season classes in Odense, Svendborg and Højer.

# Teaching Technology in a volunteer union

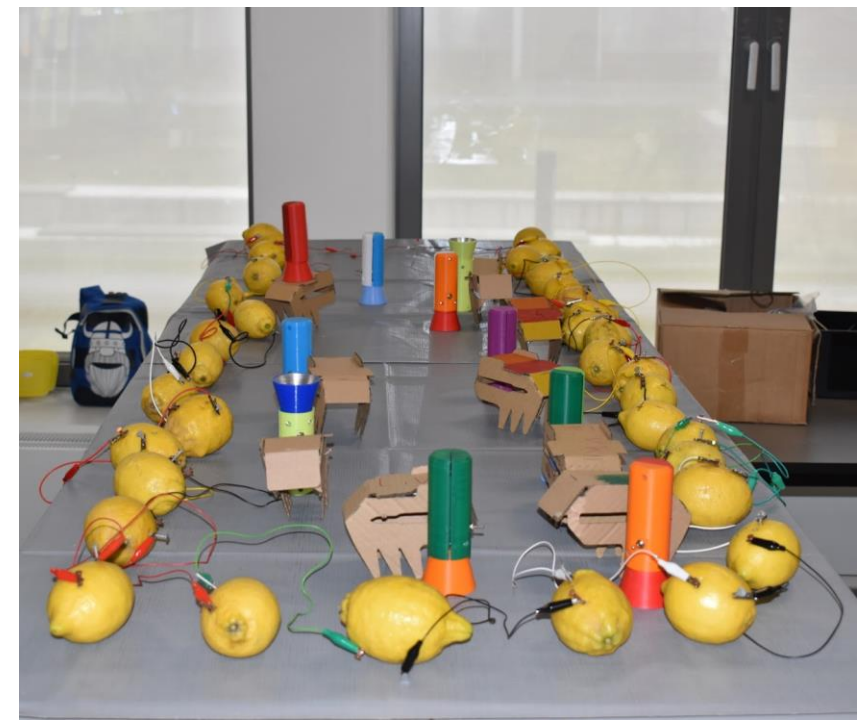
- Kids come after a full day of school
  - They do NOT want more “ordinary” teaching
  - They would like to be motivated through examples and projects
  - It is OK, that things are hard to learn – they actually expect it, but they also expect support



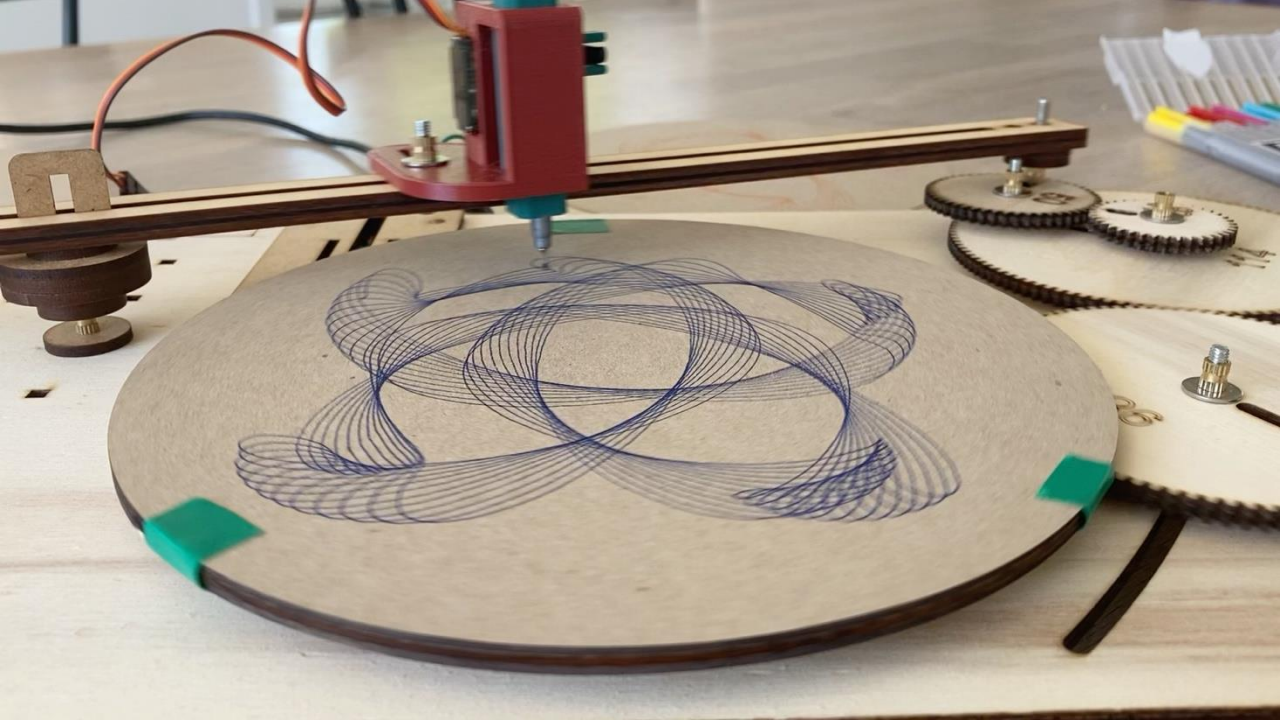
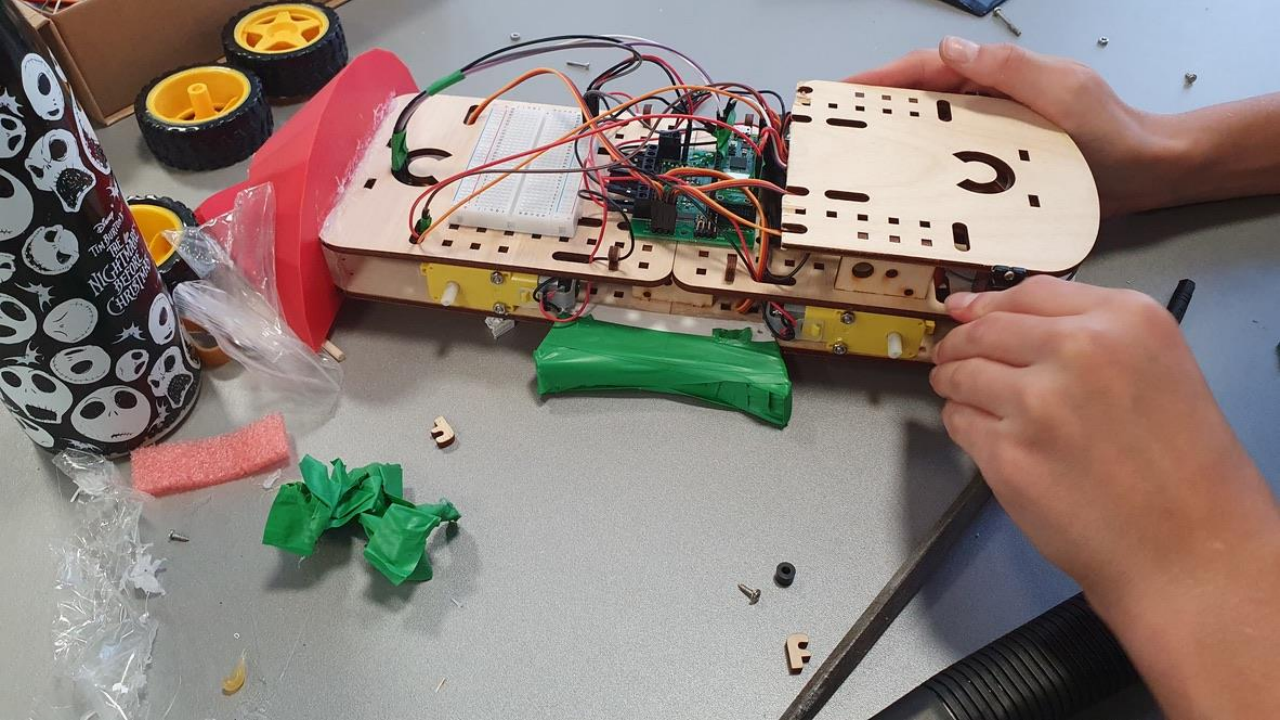
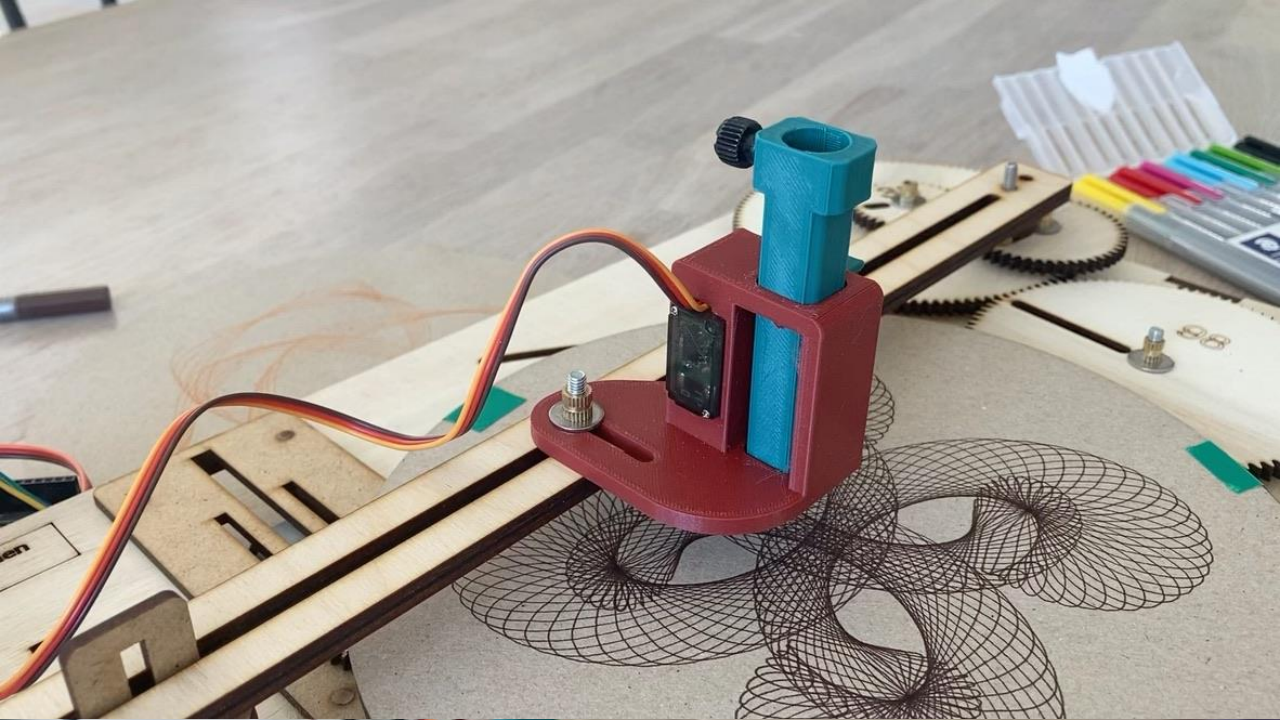
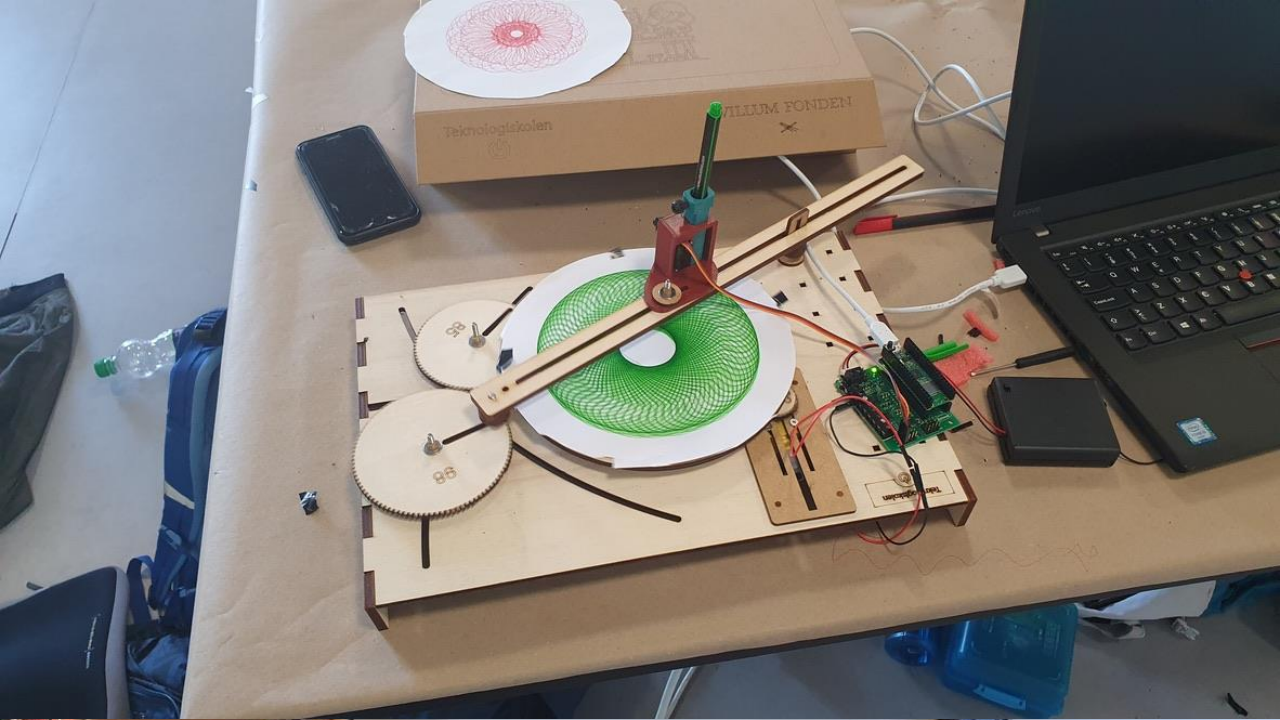














# The projects webpage

- <https://www.teknologiskolen.dk/campforloeb/>
  - Design guidelines for kids are important here!
  - Refinement is ongoing through feedback from participants and volunteers
  - Not just the online materials, but also physical materials

# Prioritized list of changes from last camp

## Prioritet 1

- Imødekom de yngste:
  - Ønske om lettere materiale for at mindske en-en-hjælp, især for de yngste.
  - Ønske om mere letforståelig tekst
  - Ønske om et mere pædagogisk introduktionsforløb.
  - Ønske om flere forskellige projekter, processer og lege for at sikre, at alle deltagere kan følge med uanset niveau - altså et mere varieret program.
  - Ønske om en værktøjskasse til deltagere, der ikke er på niveau, f.eks. ved brug af mBot2 eller SPIKE sammen med microbit.
  - Ønske om facit/fungerende kode som reference for at lette hjælp og samarbejde.
- Mere skriftligt materiale
  - Flere opgaver i papirform (tusser og papir)
  - Papirvejledning der forhindrer copy-paste-implementering

# Prioritized list of changes from last camp

## Prioritet 2

- Videoer:
  - Ønske om flere videoer, gerne til alle opgaverne.
  - Ønske om at videoerne bliver opdelt i små videoer eller at der er links til dem.
  - Ønske om flere videoer, billeder, tegninger til at understøtte materialet.
- Flere hænder:
  - Ønske om flere hjælpere (og at de bliver informeret i bedre tid)
  - Begræns Internettet:
  - Ønske om at deltagerne ikke har adgang/begrænset adgang til internettet (undgå distraktioner som spil eller Facebook)



# The main Teknologiskolen takeaways for EUD for Kids

- Kids learn and evolve fast, and your applications have to be able to follow them, or concentrate on only a specific short age-span
- Kids do not want to wait for help – things should be explained using multiple learning media, and extra learning pathways may have to be introduced.
- Extra activities – Kids operate at different speeds and levels, and do not like to wait for others to catch up, so
  - Provide with extra materials or challenges
  - Allow them to help others reach the same level

# The main Teknologiskolen takeaways for EUD for Kids

- Collaboration may be important – e.g. working in groups, but not all Kids operate efficiently in groups, so there always have to be options for working alone
- Kids want to be involved, so one-way communication for more than 5 minutes is a no-go.
- Kids want to explore and like when things are tangible, so remember to think “out of the screen” as well. Hands-on experiences stimulate their learning better and often motivates better as well.

A clip from  
back in the  
days 😊

