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IKTISHAF

Explore... Learn... Create

مؤسسة ولي العهد
Crown Prince Foundation

مساحة الصنّاع
The Makerspace

Inspiration

1

Snap Circuits

2

Little Bits

3

Arduino

- Expensive
- Hard/Cold
- Static
- Limited Sensory Engagement
- Isolated

1

Snap Circuits

2

Little Bits

3

Arduino

Problem

Lack of educational kits designed with soft and tactile materials

Lack of educational kits revolving around soft robotics

Why Soft Materials Matter

1

Hard Materials are not welcoming

Rigid, hard-plastic kits can feel cold and intimidating, discouraging curious beginners

2

Sensory Sensitivities

Children with sensory sensitivities or fine motor challenges may struggle with stiff materials

3

Better User Experience

Soft, flexible modules are easier to handle and more inviting, increasing comfort and engagement.

Sensory Engagement

1. Designing Multi Sensory Environments for Children's Learning: An Analysis of Teachers' and Researchers' Perspectives

2. Beyond play: a comparative study of multi-sensory and traditional toys in child education

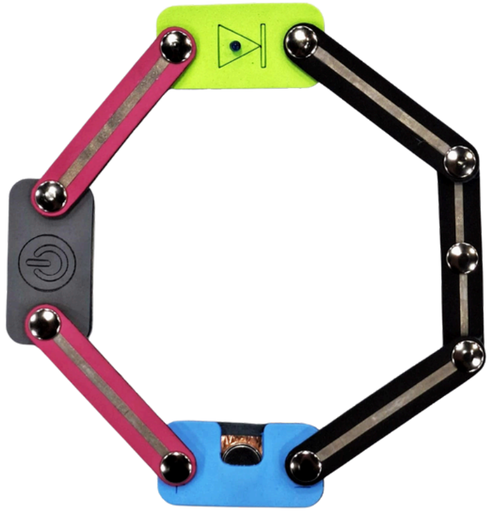
3. Smart Toys in Early Childhood and Primary Education: A Systematic Review of Technological and Educational Affordances

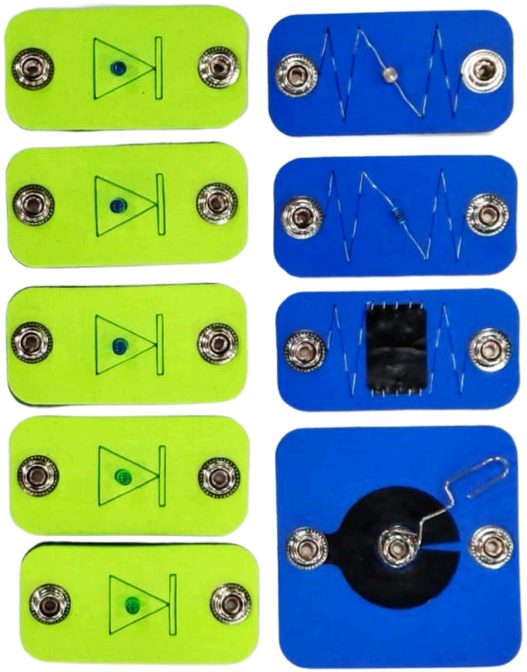
The Opportunity

Growing interest in hands-on STEAM education

Untapped niche: soft robotics + electronics kits for kids.

Differentiation: Stand out in a saturated educational toy market





The Concept

- Modular kit made from silicone and textile-based electronics.
- Easy snap-together connections
- Integrates simple circuits + pneumatic elements
- Open Source
- Affordable
- Accessible
- Customizable

Modules

Power, Inputs, Outputs, Pneumatics

Power, Sensors, Actuators, Connectors

Manufactured using Digital Fabrication

Laser Cutting, 3D Printing, Molding and Casting, CNC Machining

From Soft Materials

Textiles, Conductive materials, Velostat, Silicone, Plastics

Ecosystem

Educational Value

1. **Hands-on learning supports problem-solving and creativity.**
2. **Encourages curiosity about electronics, robotics, and materials science.**
3. **Aligns with STEAM standards and fosters early STEM interest.**

Target Audience & Use Cases

Ages 6+

Home, schools, maker spaces, workshops, museums

Educators and Parents

Plan

1. Prototyping initial modules
2. User testing with educators & kids
3. Refinements, curriculum development, more modules
4. Conduct workshops
5. Create platform

THANK YOU

Soft Mod Bots

HOME COMPONENTS CIRCUITS UPDATES ABOUT CONTACT

HOME

What is the Soft Circuits Toolkit?

The Soft Circuits Toolkit platform is a collection of components, tutorials, and documentation to teach about pneumatic circuits. The toolkit was designed by Katrien van Riet in the Soft Robotic Matter group at AMOLF in the Netherlands.

The toolkit allows anyone to prototype fully soft circuits that work on air instead of electricity. These types of pneumatic circuits can be used to create soft robots or intelligent devices such as shape-changing wearables. Because these designs are fully soft, and thus safer for humans to interact with, they show great potential in areas such as healthcare and human-robot interaction. As such, education in designing soft circuits, including pneumatic circuits, is needed. On this website you can find tutorials on how to use the toolkit, complete with step-by-step instructions and example videos.

How to get started?

Start by learning about components or building the example circuits! You can also take a look at the manual.

PROJECT

This project focusses on the design of a toolkit that enables the rapid prototyping of completely soft, fluidic (air) circuits.

Sensation Map

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Gallery

Project
PORTFOLIO

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