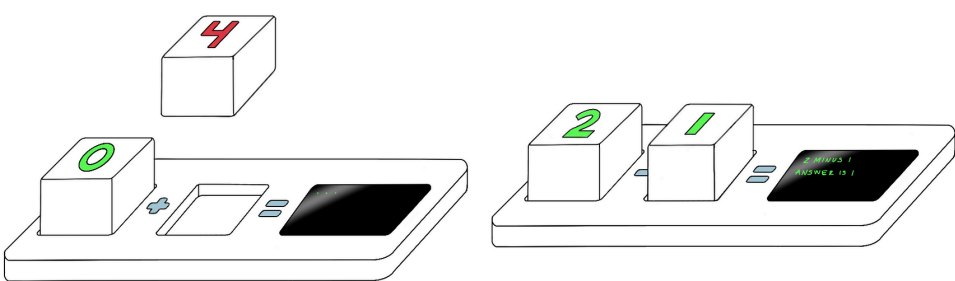


The **Math Blocks Learning Toy** provides an intuitive platform for children to practice and improve their math skills. The system involves:

- **Interactive Base:** Equipped with sensors to detect two block inputs.
- **LED Display:** Displays the calculated result based on the inputs (e.g., numbers and operators).
- **RFID:** Used to identify specific blocks and their configurations.
- **Neopixels:** Provides visual cues and engaging feedback during gameplay.

The design emphasizes straightforward functionality, where children use numbered and operator blocks to perform calculations, and the base instantly provides the correct answer. This simple yet engaging approach encourages numerical fluency and builds problem-solving skills in a fun, hands-on way.

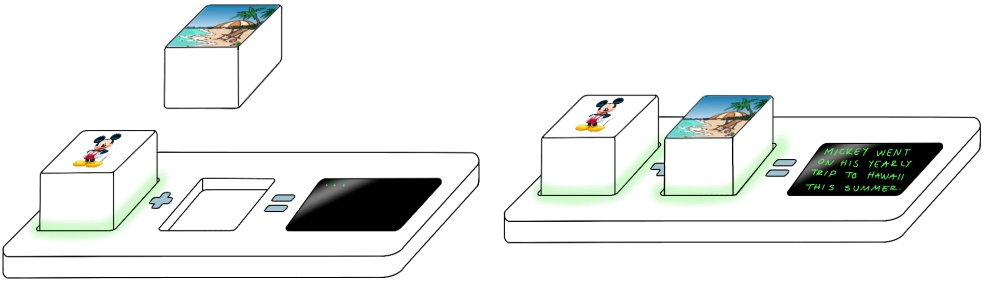


OR

The **Storytelling Kit** encourages creativity and imagination by enabling children to craft unique narratives. This device includes:

- **Interactive Base:** Reads block configurations representing characters, settings, and/or plot elements.
- **LED Display:** Presents random story outputs generated by AI based on the block inputs.
- **RFID:** Detects specific elements placed on the base for storytelling.
- **Neopixels:** Provides visual cues and engaging feedback during gameplay.

This device integrates AI to create narratives from the detected elements, providing an imaginative and tailored experience for each child. This project aims to inspire literacy, creativity, and emotional expression while offering a fun and immersive storytelling journey. Characters, settings, and/or plot.



Research Plan

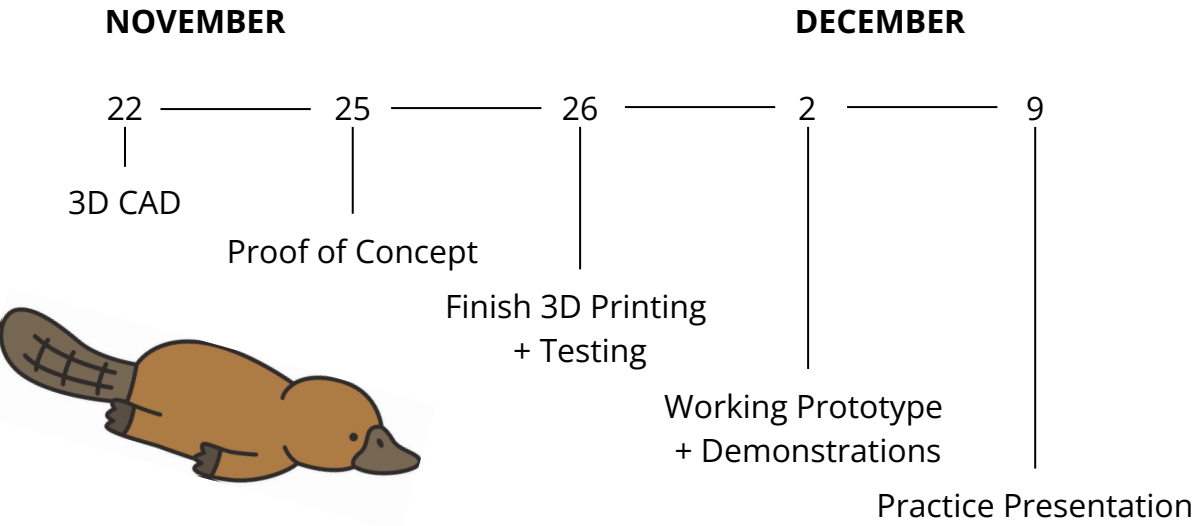
- **Sensor Integration:** Experiment with sensors and RFID technology to ensure accurate detection of block inputs.
- **LED Display Functionality:** Prototype and refine the display to show clear and immediate feedback.
- **Visual Feedback:** Experiment with Neopixel configurations to optimize engagement through dynamic visual cues.
- **User Interaction:** Conduct usability tests to assess the effectiveness of the hands-on learning approach.
- **Data Processing:** Develop and test the logic for calculating results based on detected inputs.

OR

- **AI Story Generation:** Integrate and refine AI algorithms to create dynamic and engaging stories based on inputs.

Current Work

- I have completed initial sketching and brainstorming for the project and have purchased the necessary sensors. No hands-on work has been done yet.
- Next steps are the following: finalize the design, test sensors for compatibility and functionality, develop and test basic code for input processing and outputs, and prototyping with 3D printing and maybe laser cutting.



Motivation

My primary focus for this project is to **master computational design and fabrication**, particularly refining my ability to balance aesthetics with functionality. While these remain my core goals, I aim to **improve** my foundational understanding of **microelectronics and coding** to create functional prototypes.