ES115: Design, Innovation and Prototyping

Concept Development And Detailing

Team “Seven Mavericks”

Meet the “Mavericks”

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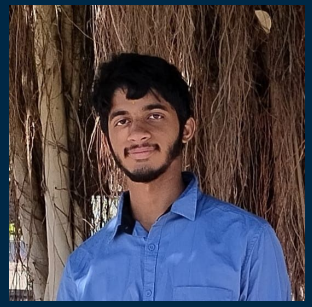

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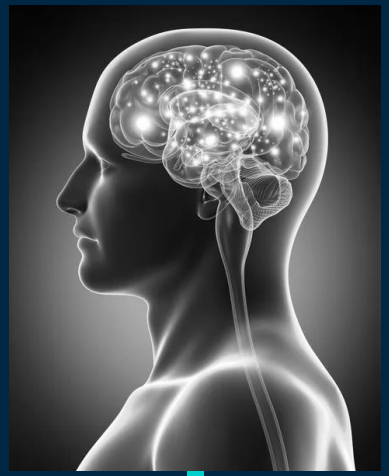
Project Statement

To design a memory-strengthening game for the elderly diagnosed with or at the risk of developing dementia and related disorders.



User Group

The toy will target the elderly who are prone to/suffering from the following:

Amnesia

Partial or complete loss of memory

Alzheimer's

Accumulation of proteins in the brain that affect mood, personality and basic bodily functions.

Dementia

Progressive neurological disorders affecting memory, thinking and behavior

Design Opportunities

01 **PORTABILITY**
Lightweight & ergonomically designed for mobility

02 **TANGIBLE**
Non-digital to prevent asthenopia (eye-strain)

03 **SIMPLICITY**
Symmetric structure with minimal colour choices

04 **GERIATRIC-FRIENDLY**
Smooth-edged with no sharp corners

Environment

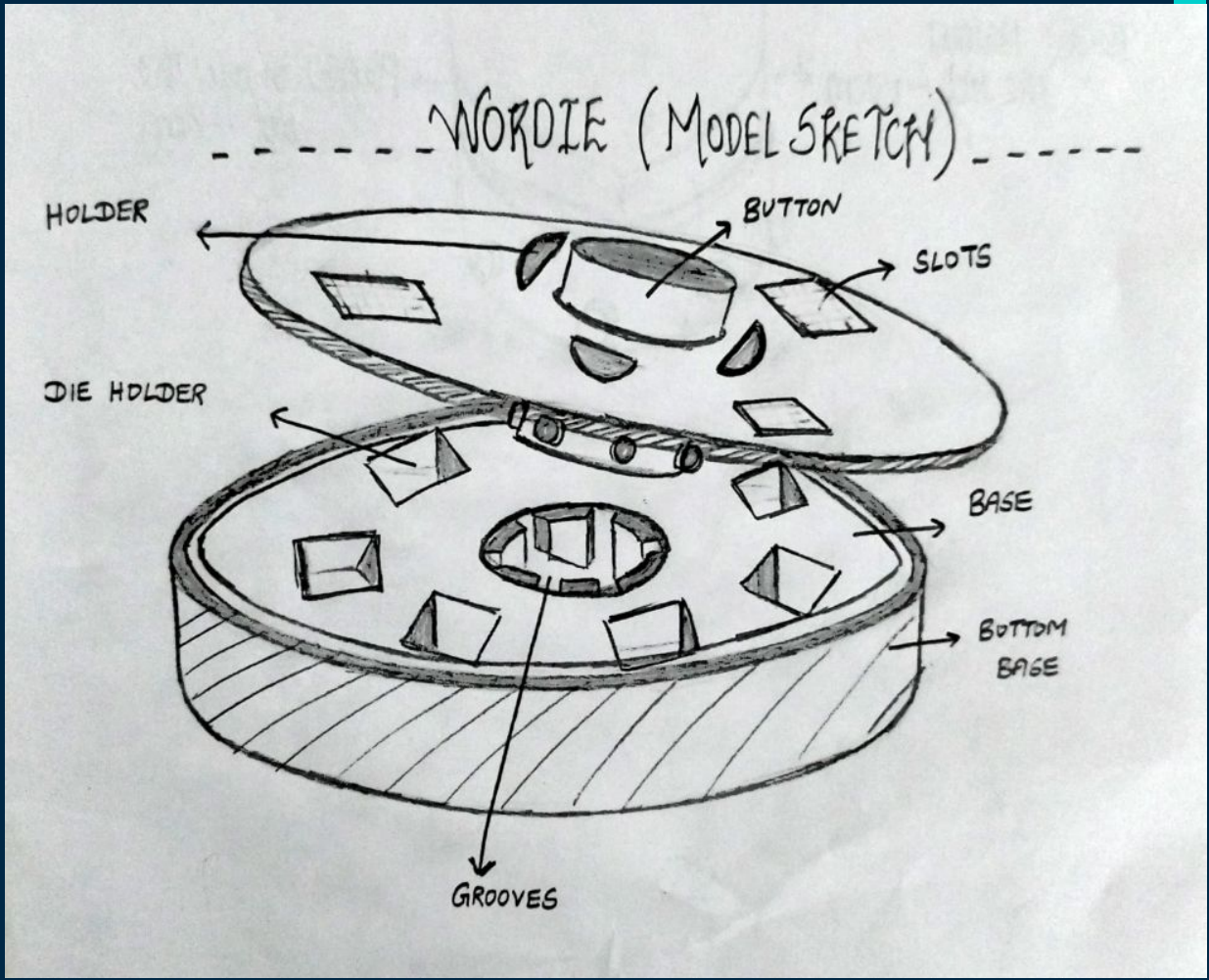
Indoors

The game can be played at home, temples and clubs by the elderly at their own leisure

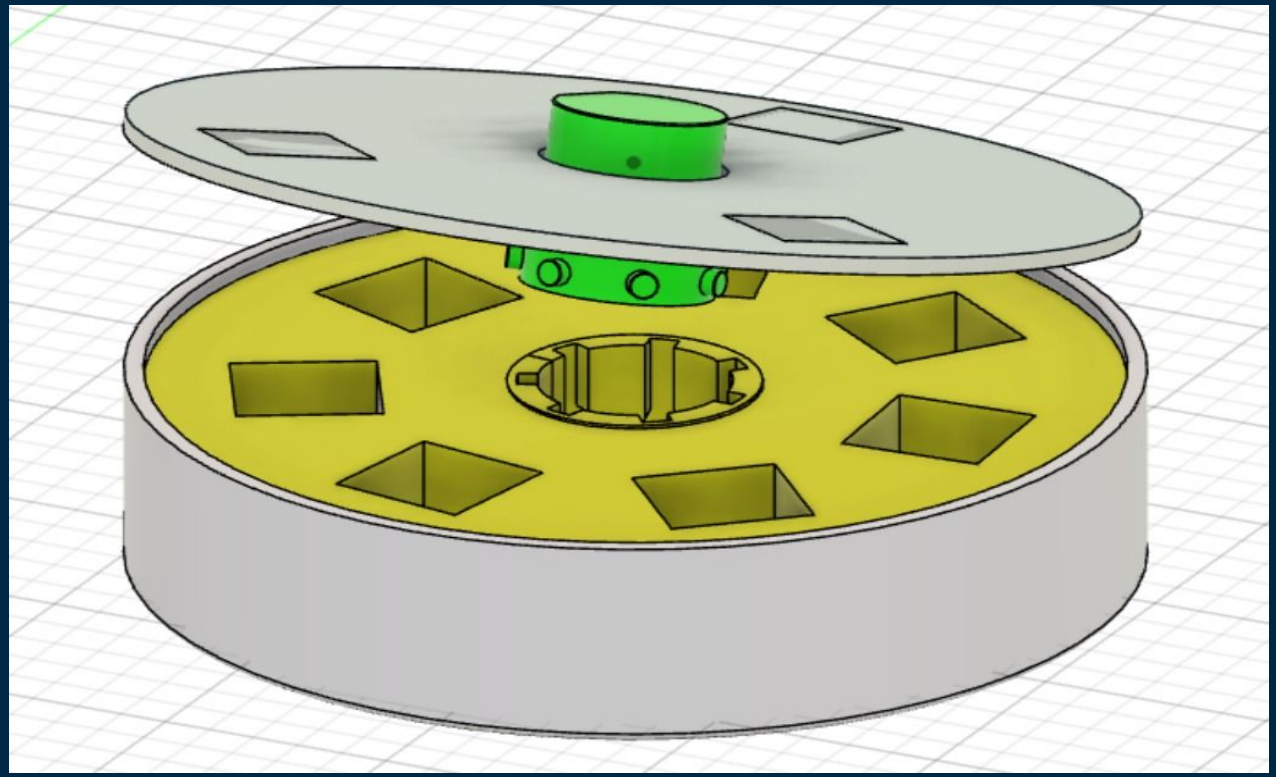
Outdoors

The game can also be played outdoors, such as at parks or alternatively, while travelling.

SKETCH OF OUR FINAL IDEA (TOY)



3D SKETCH OF OUR FINAL IDEA (TOY)



Designed with Autodesk Fusion 360

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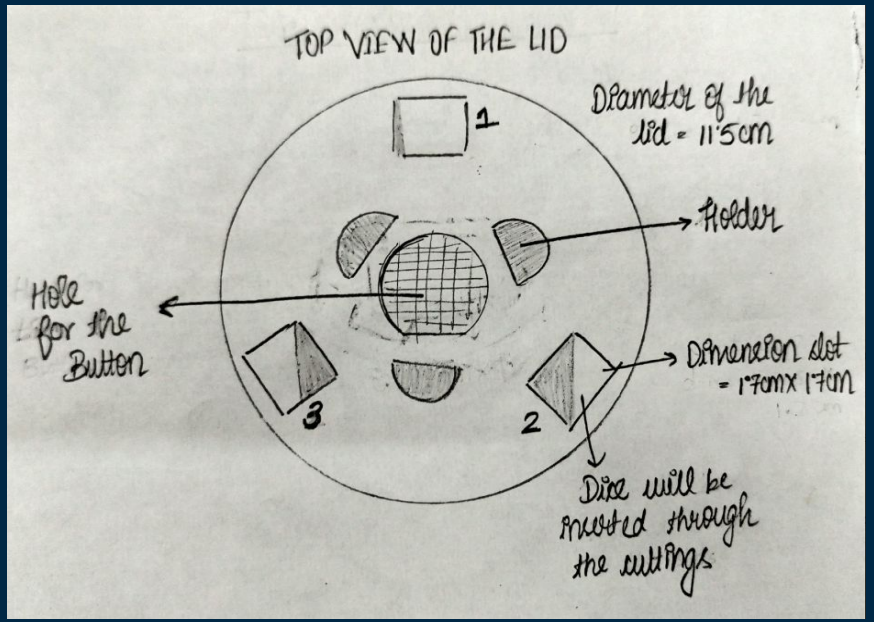

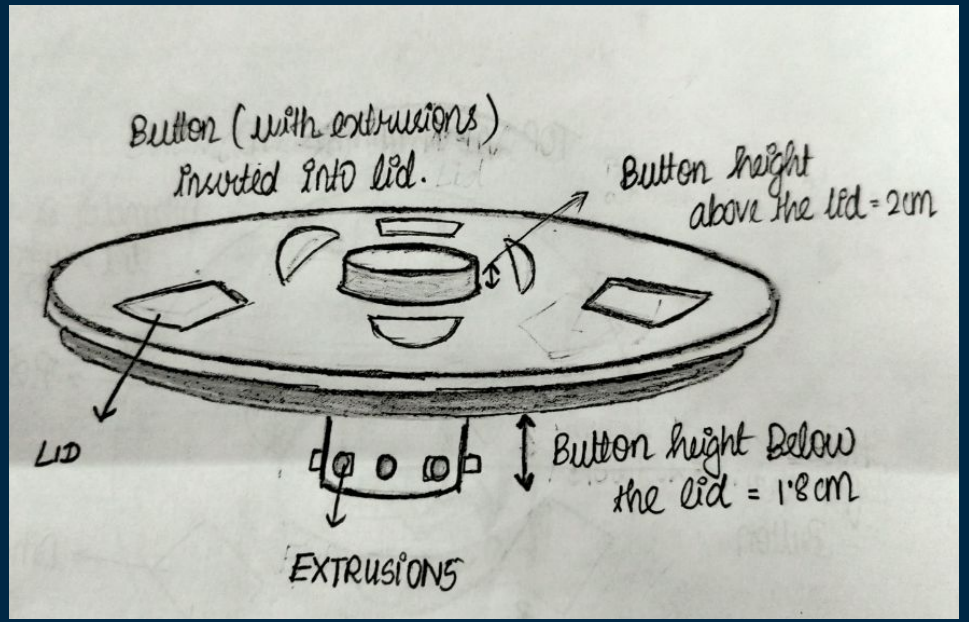

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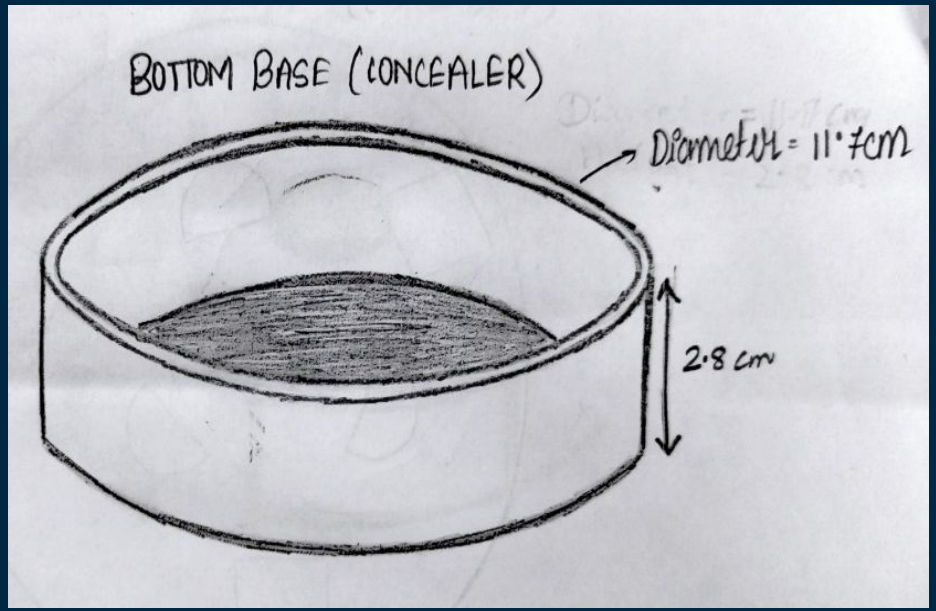

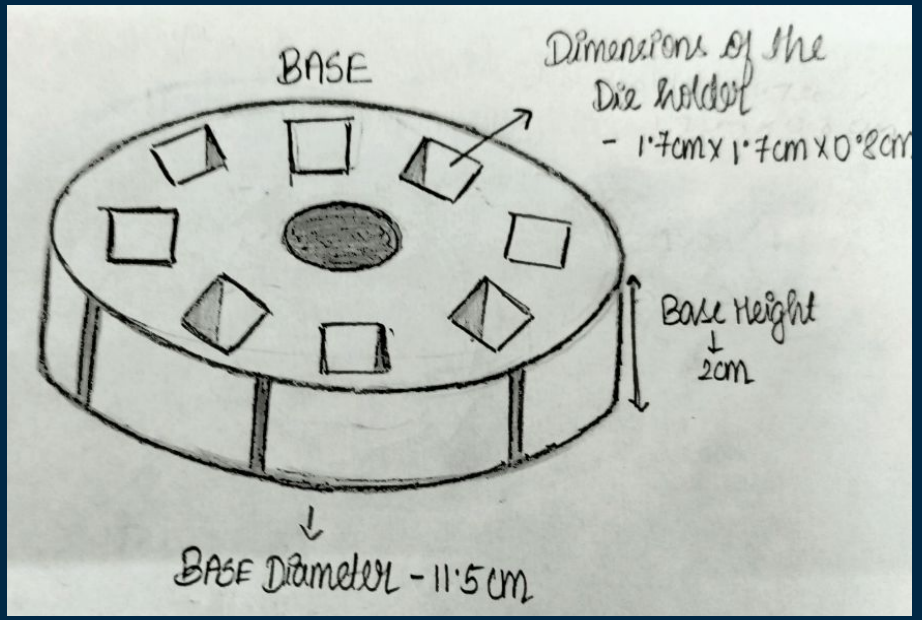

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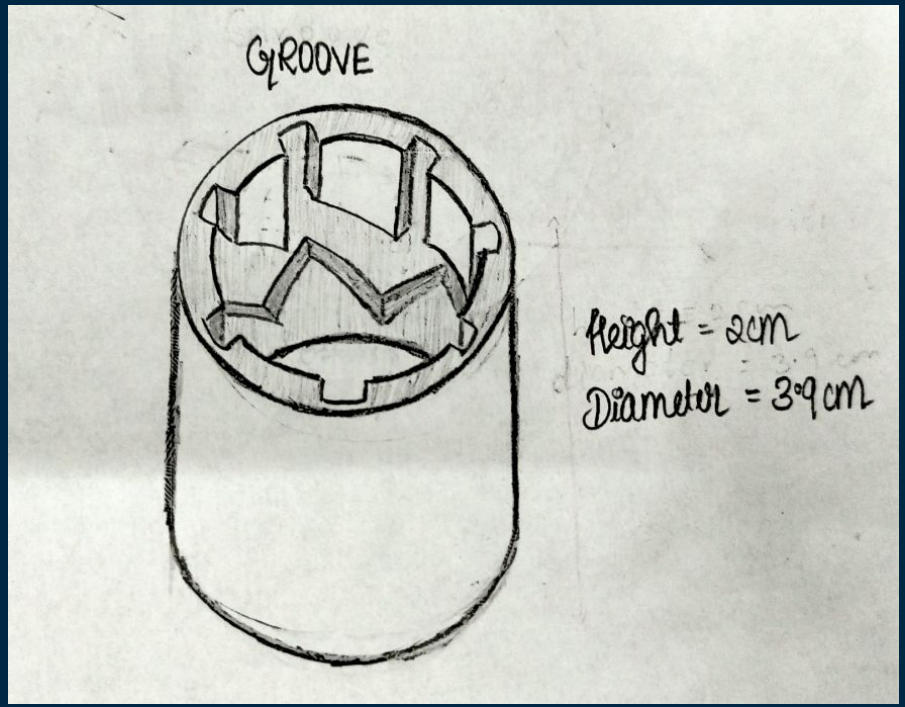

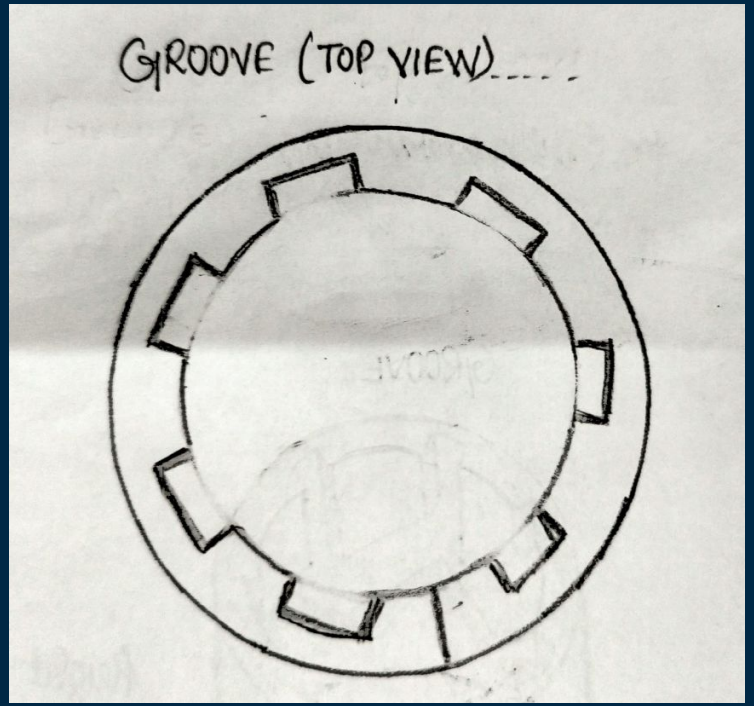

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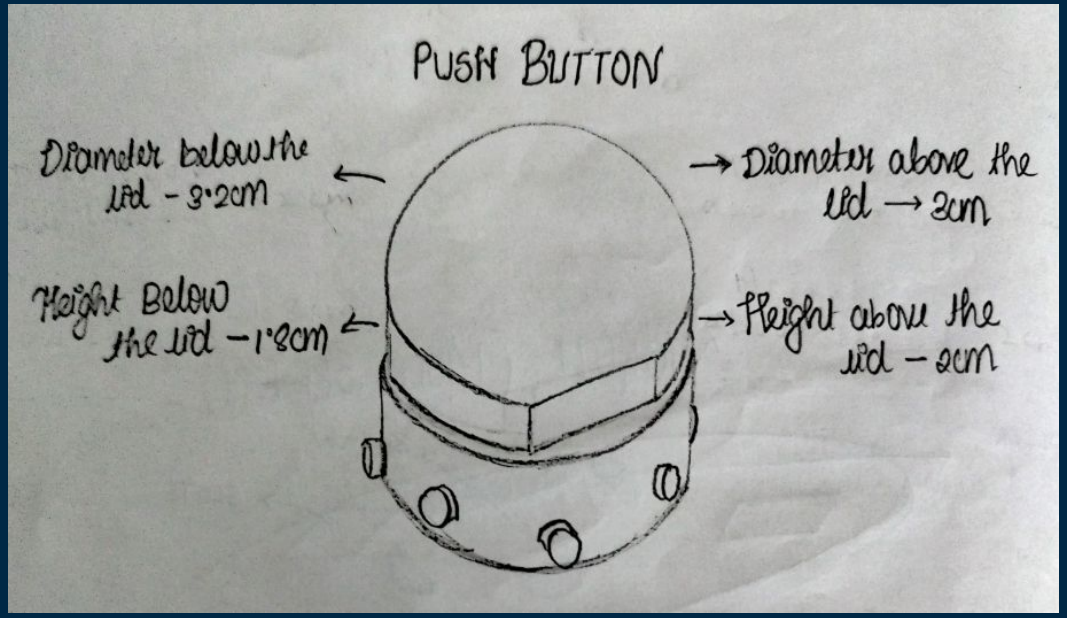

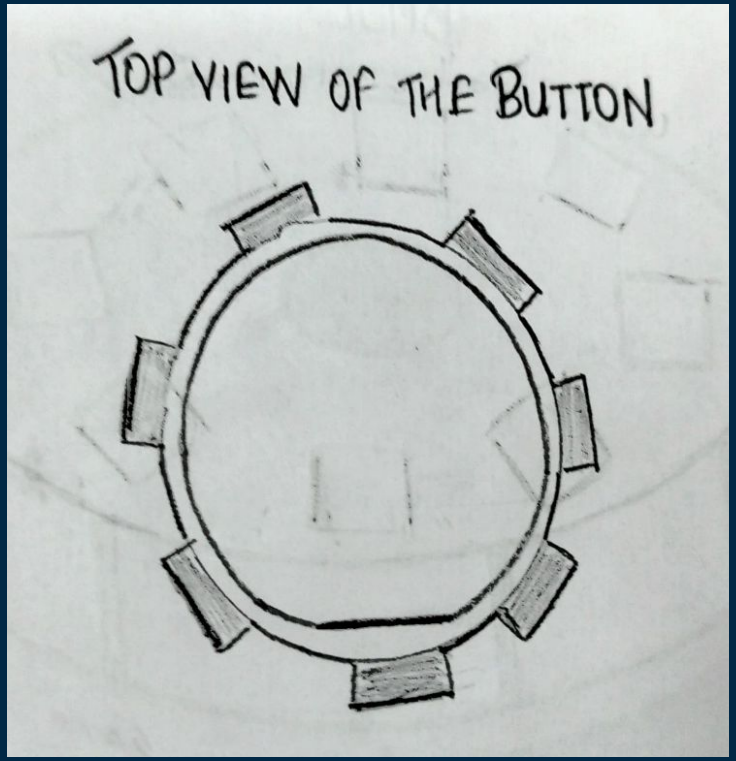

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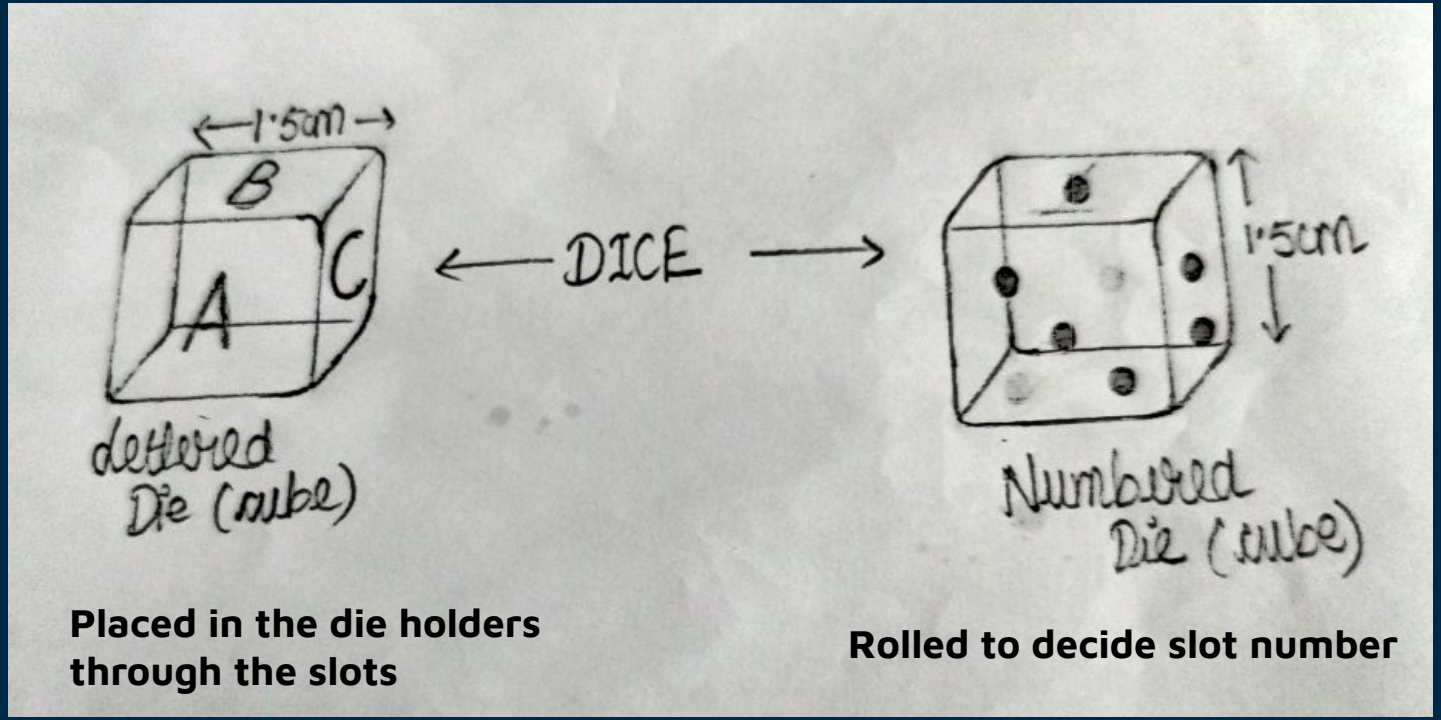

Placed in the die holders through the slots

Rolled to decide slot number

LIST OF TRADES THAT WILL BE USED

- Additive Manufacturing
- Laser cutting
- Joining and Finishing process

LIST OF MATERIALS REQUIRED

- MDF sheet – 1 board of 0.3 mm thickness
- PLA/ABS – Quantity might vary as per requirement for 3D printing
- Paints like sealers will be required to make the toy waterproof and smooth.
- Adhesives like Vetra will be used to stick various components.

RELEVANCE TO OUR PROJECT STATEMENT

- Short-term memory loss is one of the symptoms of dementia and is quite common amongst the elderly.

- Wordie addresses the issue of short term memory loss. The player is expected to remember what was the most recent letter added and using which slot it was added.

- If one succeeds in recalling the above two factors in every round, they would find the expected word on opening the lid finally.

DETAILING FOR USABILITY

- Safety:
  - The toy is geriatric-friendly and the players are in danger of no accidental harm.
  - Curved edges and no sharp corners in any of the components.
  - Our toy has no digital components, which makes it tangible (no strain for eyes).

DETAILING FOR USABILITY

- Intuition:
  - Clearly demarcated numbers next to the slots to sharpen intuition.
  - Consistently engaging the mind and making intuitive adaptations as needed during gameplay.

DETAILING FOR USABILITY

- Comfort:
  - The toy is designed at the optimum size to ensure portability and a strong grip.
  - The letters on the die are at the right size to increase readability of the elderly who might have poor vision.
  - The lid is provided with grip holders to foster comfort in opening and closing.

Detailing for techno-aesthetics

- Push-button Turn Mechanism: The extrusions of the button fit into the grooves of the base. When the button is pushed down, the base turns by 1 click. 7 button presses makes a full rotation.

- Carefully-designed holders on the lid to enable easy grip while placing/removing the lid.

- Spring of an appropriate spring constant attached between button and bottom base.

Acknowledgement

We would like to thank Prof. Manasi Anand Kanetkar for providing us this assignment which helped us learn about concept development and detailing. We would also like to thank our college, IIT Gandhinagar for providing us with the ES115 course.