Product Design 02

Wooden Toy Design

Report

Aamod Narkar | 216130013
Guided By Prof. Vijay Bapat

Table Of Contents

Design Insights

Design Brief

To design a wooden toy for children aged 9-24 months inspired from a selected animal, biomimicking its actions in order to provide the child with a playful experience of the animal.

Design Criteria

- Toy to be made in either in plywood/mdf/wood.

- Age group for toy to be considered is 9 to 24 months.

- Toy should be operated by either pulling or pushing.

- The colours and form used should be user friendly.

- Toy to be designed for indoor scenario.

Usage Environments

- Floor surface of any room interior.

- Can be used by kids while standing or sitting or crawling.

Design Insights

Must Have

- Toy should be made of material which is safe for the child.
- Operation of the toy should be easy for the child and the toy should be visually approachable.
- The toy should be able to withstand wear and tear caused by the child.

Nice To Have

- The toy should provide the child a personalized experience.
- The toy should be able to create a emotional and personal bond with the child.
- Toy should contribute in the physical and mental growth of the child.
- Toy should facilitate the child to learn and relate to the animals from the surrounding.

User Experience

- The toy should provide fun experience to the kid by building on to his/hers curiosity.
- The kid should be able to play with the toy without anyone else's help.

Design Insights

USP

- Hand crafted wooden toy with vibrant colour schemes which enhances kids engagement and aids their mental growth.

Specifications

- Primary Material: Mdf.

- Secondary Material: Aluminium rod, screws, rivets, etc

- Colour scheme to be inspired from Ladakhi culture. Colours should be bright to make them attractive for kids.

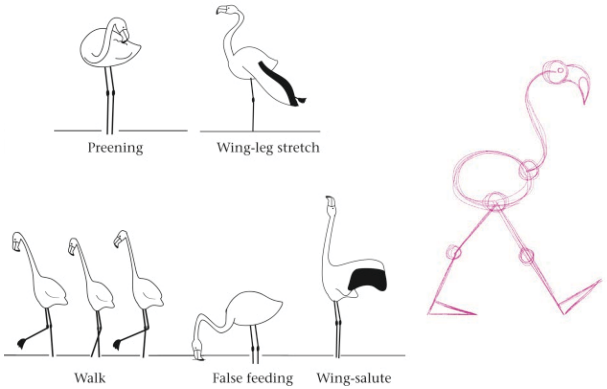
Servicing and Maintenace

- It should be easy to clean.

- It should be easy to operate.

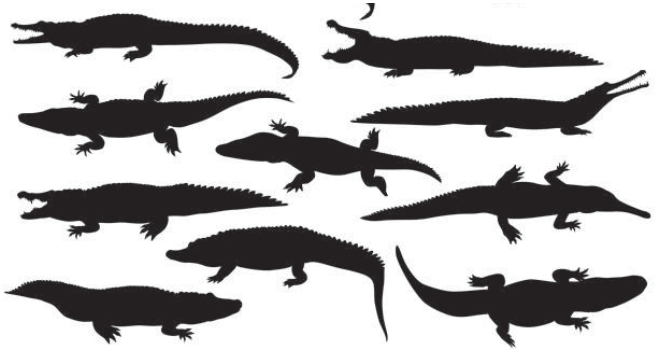
Three Inspirations

01: Flamingo



My first selected inspiration was a flamingo because of its unique body structure with a elegant neck and slim legs. The walking motions of the flamingo along with its neck movements were found interesting.

02: Crocodile



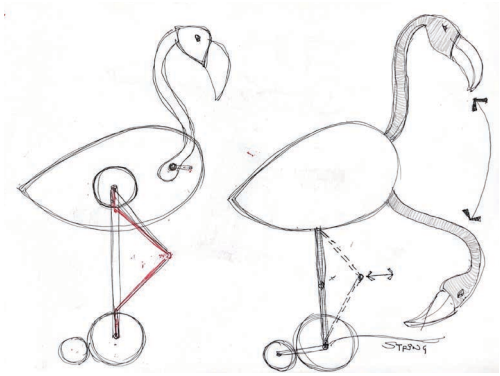
My second selected inspiration was a crocodile because of its long and rough body aesthetics. It has different motions on land and in water, I found interesting gestures in its swimming actions and its jaw movements.

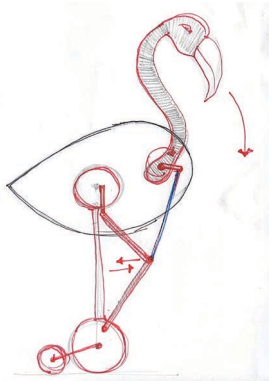
03: Indian Squirrel

My third selected inspiration was an Indian Squirrel because of its cute size and quick running motion. The most interesting observations were its tail motions and the bouncing of its rear body while running.

Mechanism Ideations

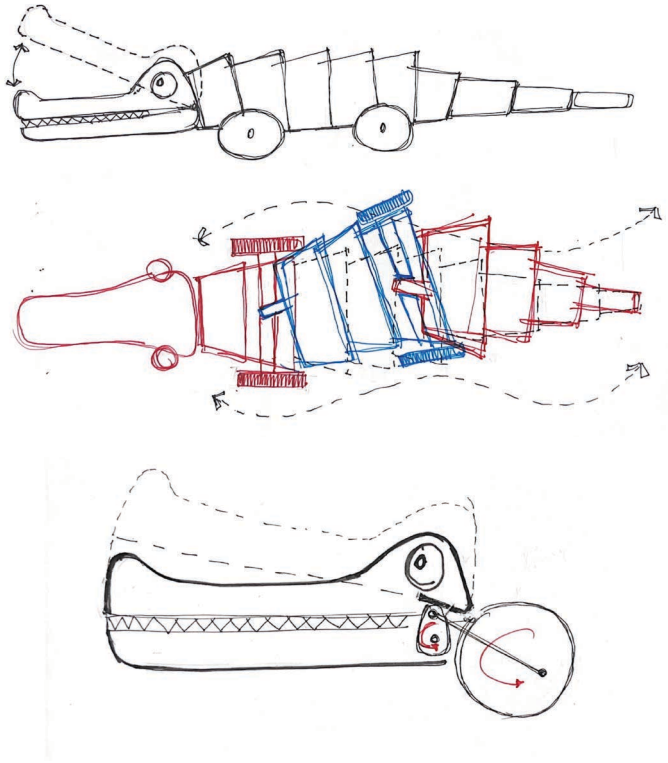
01: Flamingo





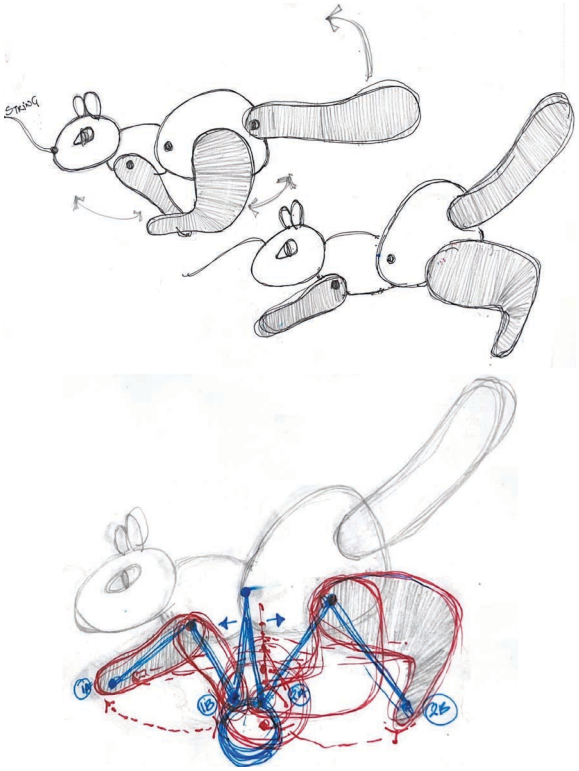
Attempt was made to design mechanism for two actions, first the neck motion in up and down direction, and second was the leg folding action.

02: Crocodile



Firstly attempt was made to design mechanism for its swimming action by fragmenting its body parts in order to achieve the flexibility in the swimming action while also creating jaw movements.

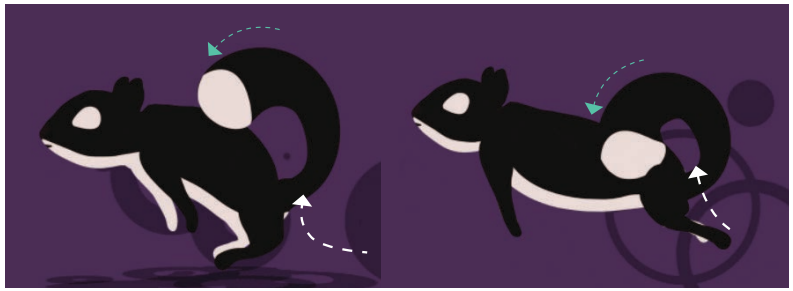
03: Indian Squirrel

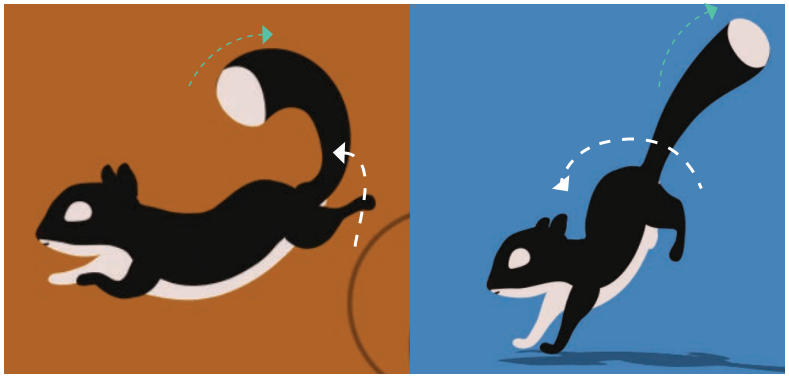


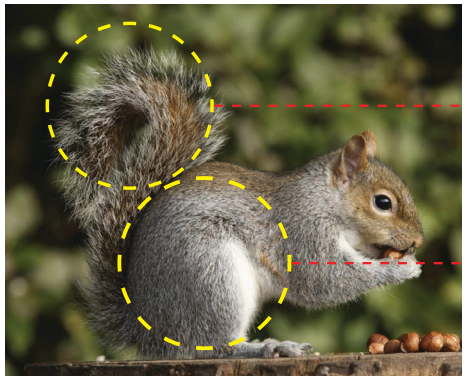
Mechanism was planned for its running action to make sure the bouncing action of the body is captured accurately, while connecting body to the tail in order to make the tail move swiftly.

Squirrel Selection

Indian squirrel was selected as I found interesting scope in biomimicking its actions of, running with a bouncing effect and the flapping of its tail, into a toy that any child would be curious to play with and the cuteness of the animal would be attractive enough to keep the child engaged.

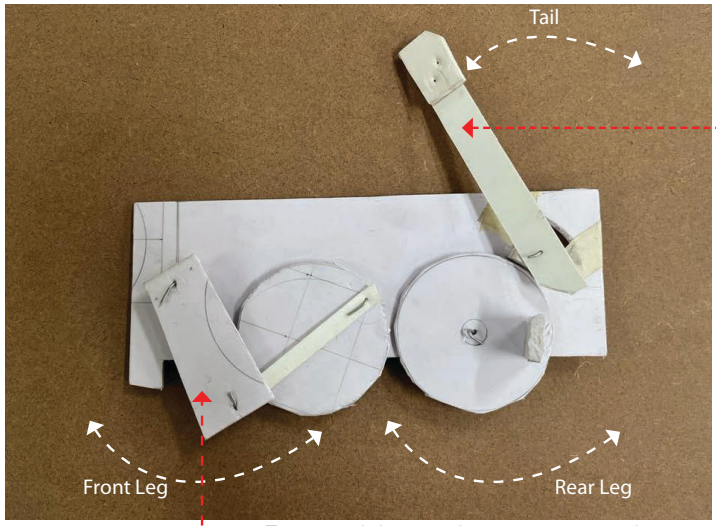






Dirty Prototyping

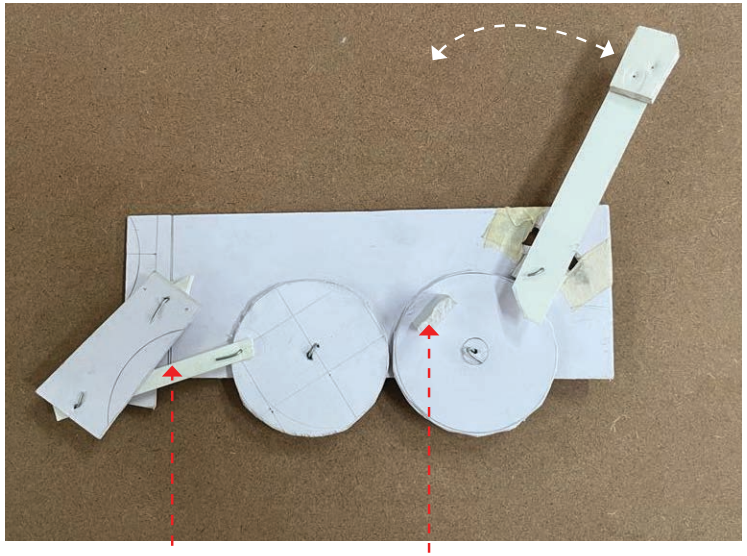
01:



Tail moves forward and backward within the given slot when the wheel hits the tail and gravity gets its back.

Front and the rear leg moves to and fro like a pendulum together in exactly opposite directions, as they are pivoted at opposite ends on their respective wheels.

Problems Identified:

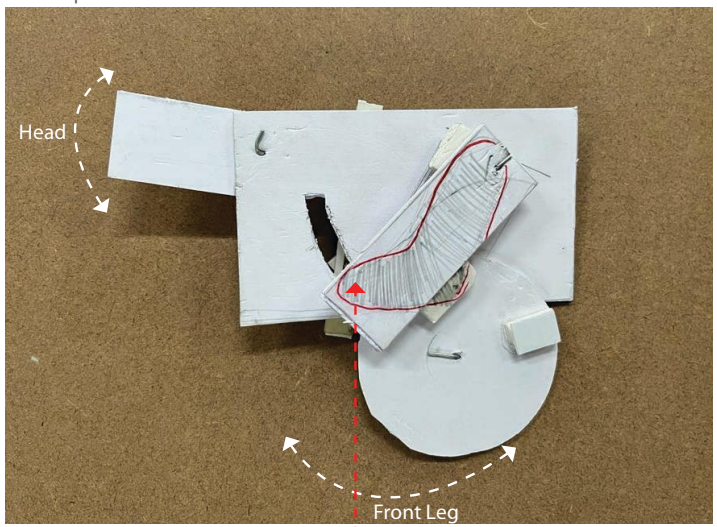


Visible lever, not possible to hide.

Extrusion on wheel to hit the tail not ideal mechanism.

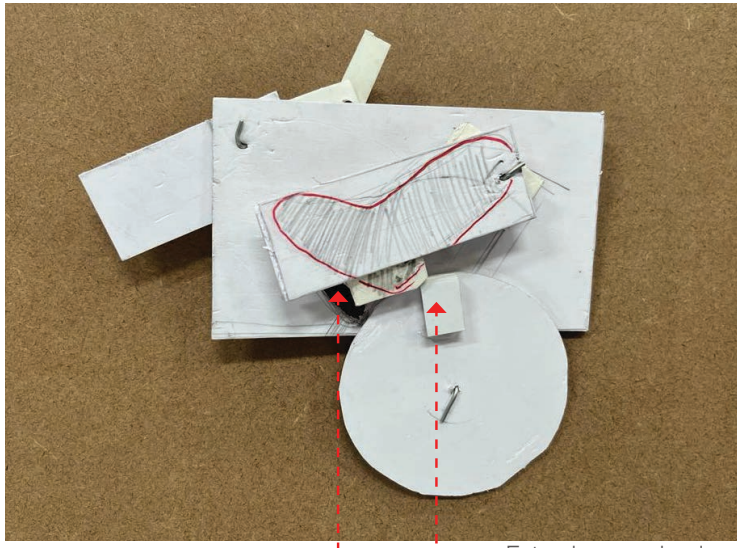
Attempt to avoid levers

02:



Front and the rear leg moves to and fro like a pendulum, as extrusion on wheels hits them at opposite ends at the same time.

Problems Identified:

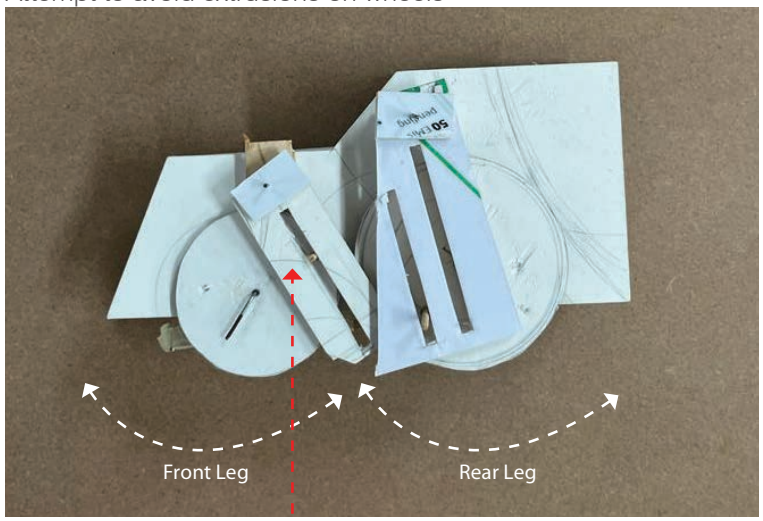


Slot makes it difficult for smooth movement.

Extrusion on wheel designed to hit the tail not ideal mechanism.

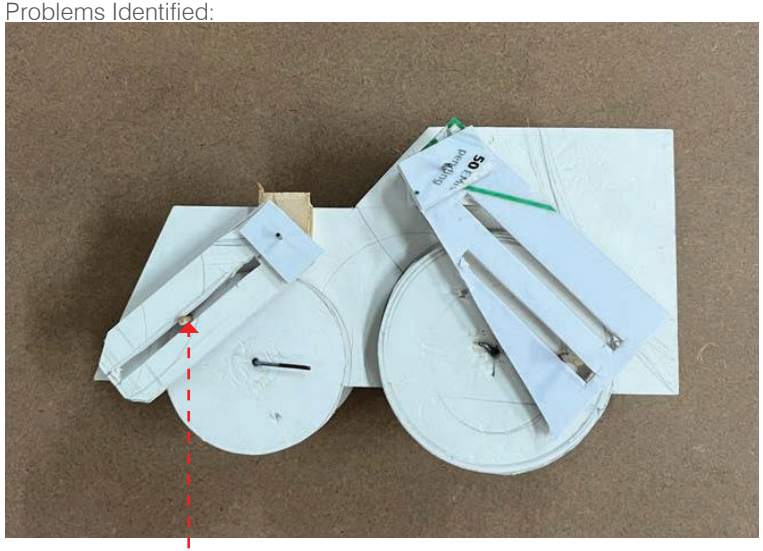
Dirty Prototyping

03: Attempt to avoid extrusions on wheels



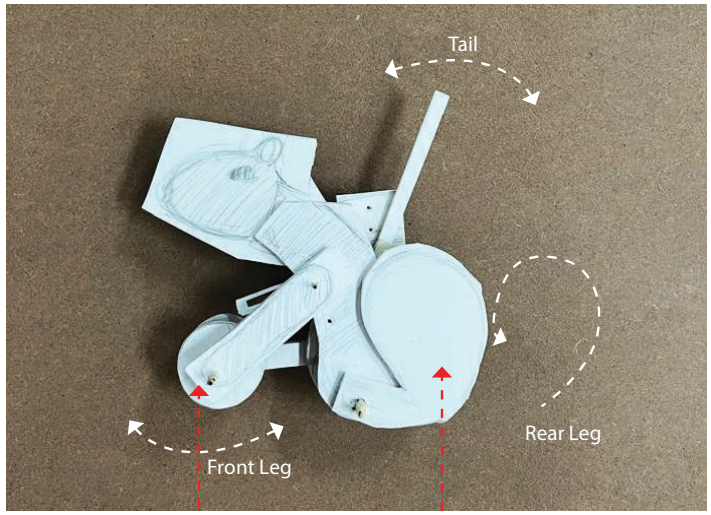
Front and the rear leg moves to and fro like a pendulum together in exactly opposite directions, as the wheels move in the slots provided on the legs.

Problems Identified:



Slot provided in the both the legs make it difficult for the co-ordination.

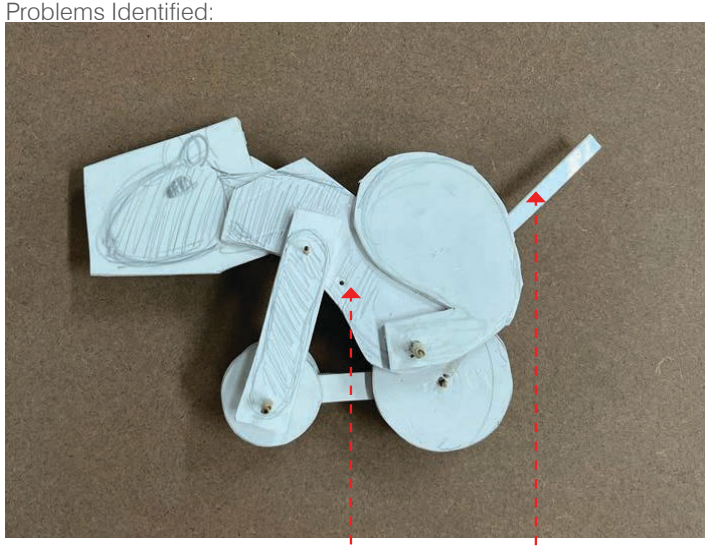
04:



Front leg, at one end fixed on the front wheel and the other end pivoted on the body restricts the body movement in a particular motion.

Rear leg jumps(up and down) forward.

Problems Identified:

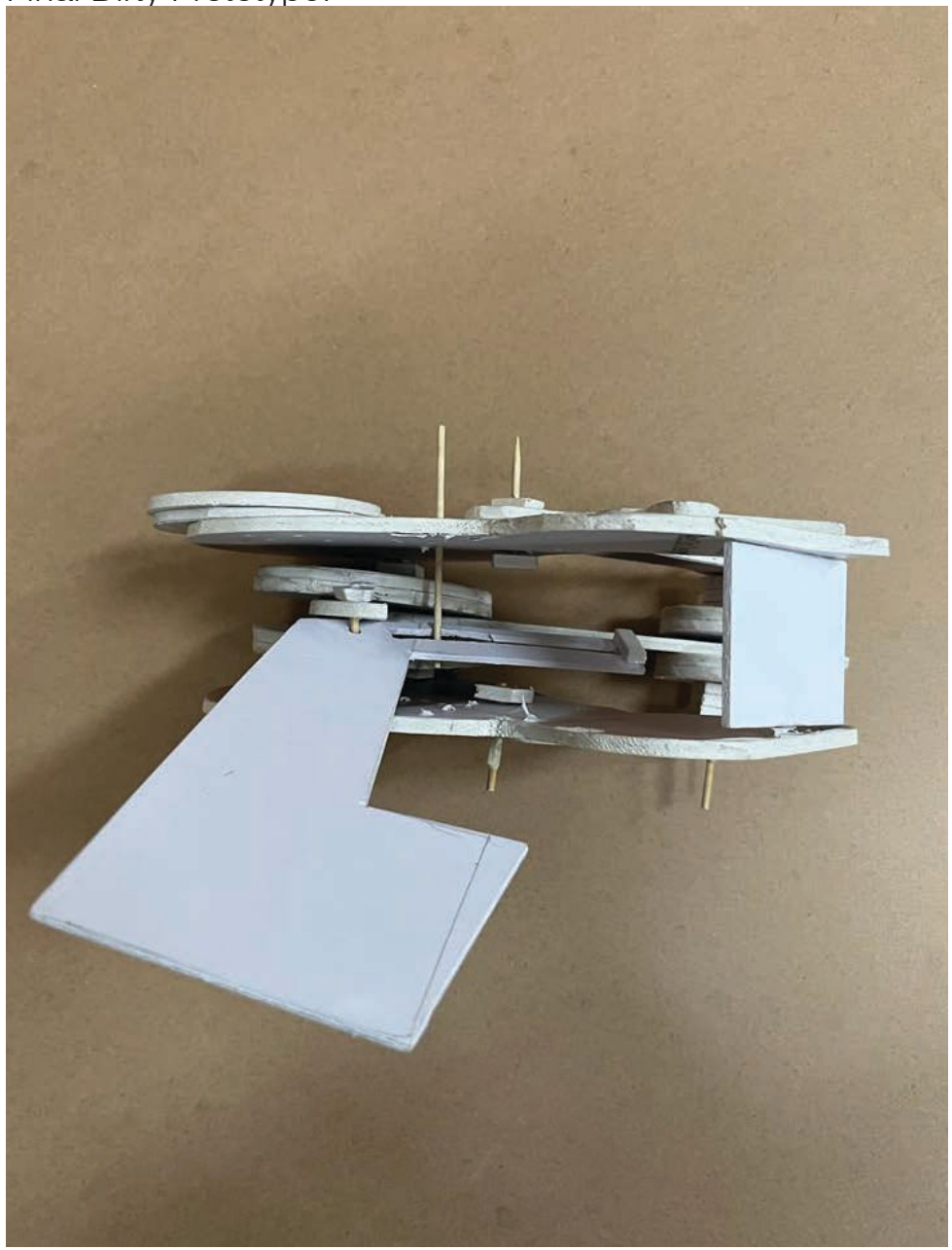


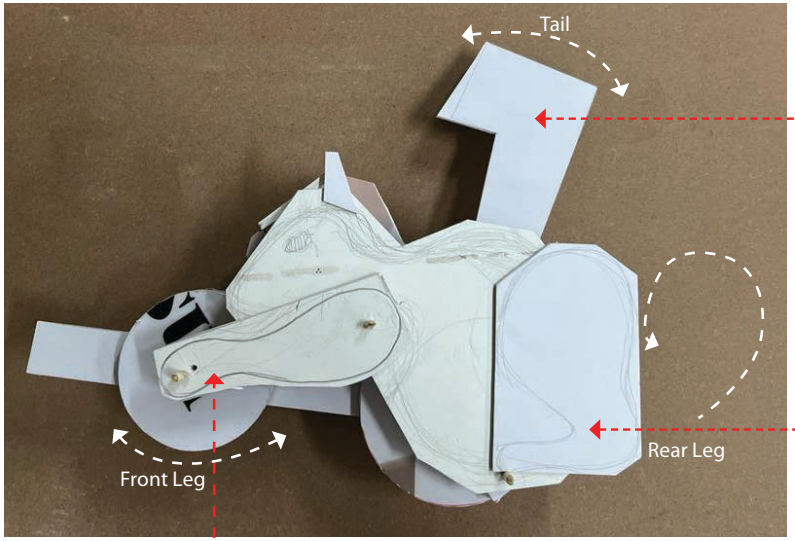
Body not jumping correctly.

Tail movement less.

Dirty Prototyping

Final Dirty Prototype:



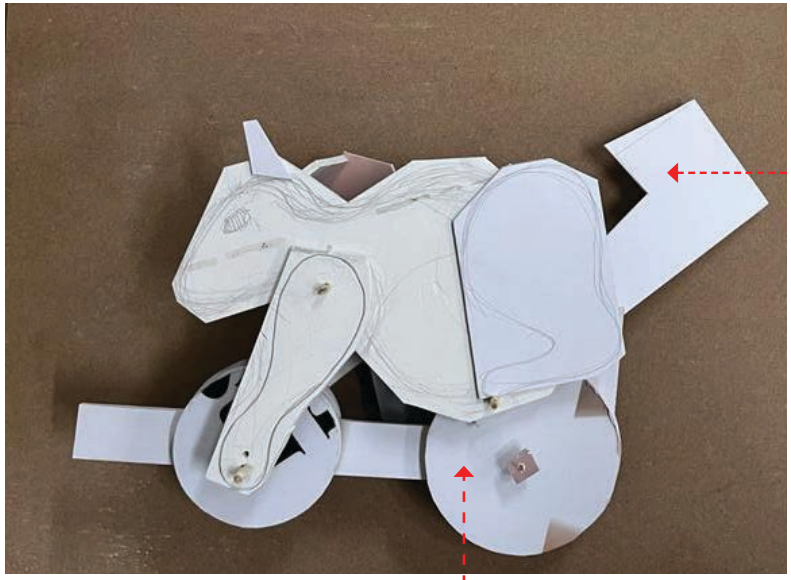


Tail movement caused by the body jumping movement.

Rear leg jumps (up and down) forward.

Front leg, at one end fixed on the front wheel and the other end pivoted on the body restricts the body movement in a particular motion.

Problems Identified:

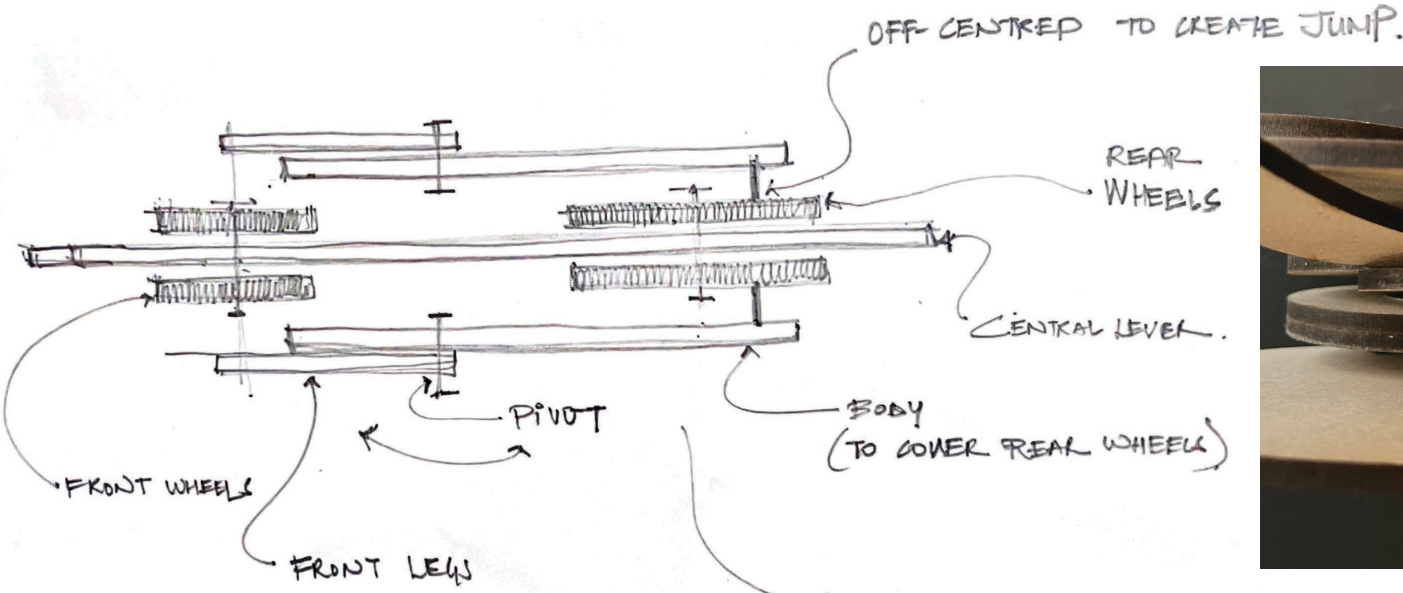


Tail movement less

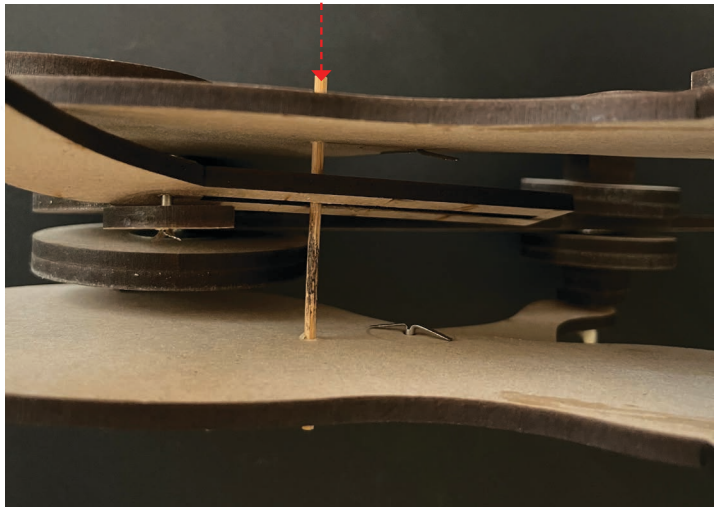
Rear wheel getting exposed a lot

Mechanism Detailing

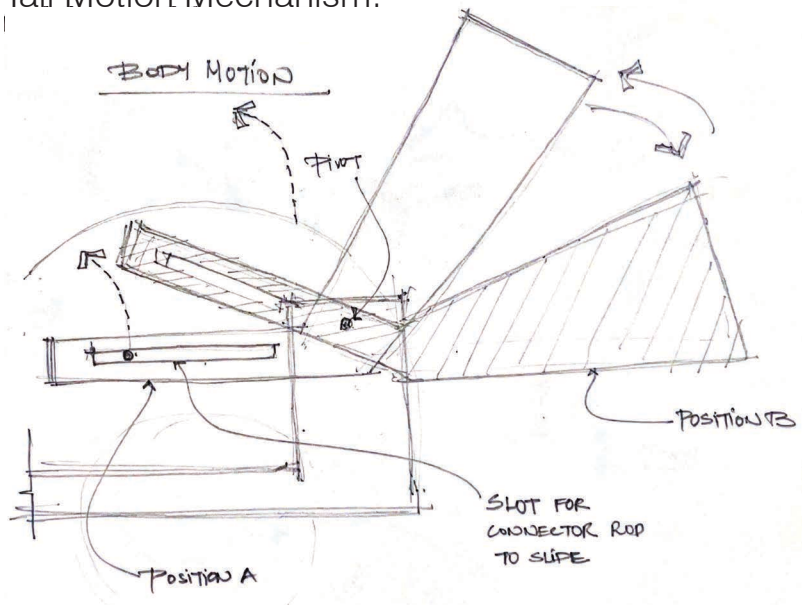
Body Motion Mechanism:

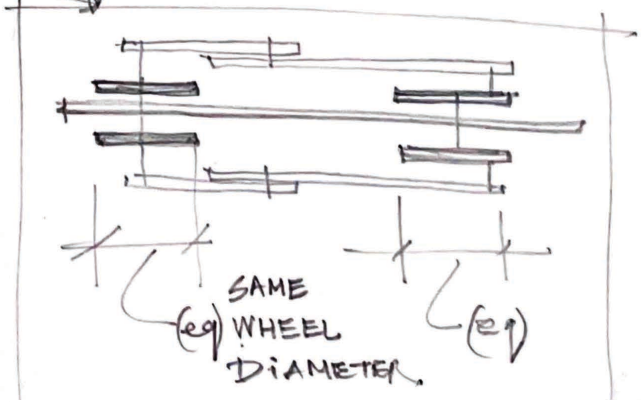


Rod provided connecting two outer body parts passing through the slot provided in the tail, making it move upwards and downwards as the toy moves ahead.

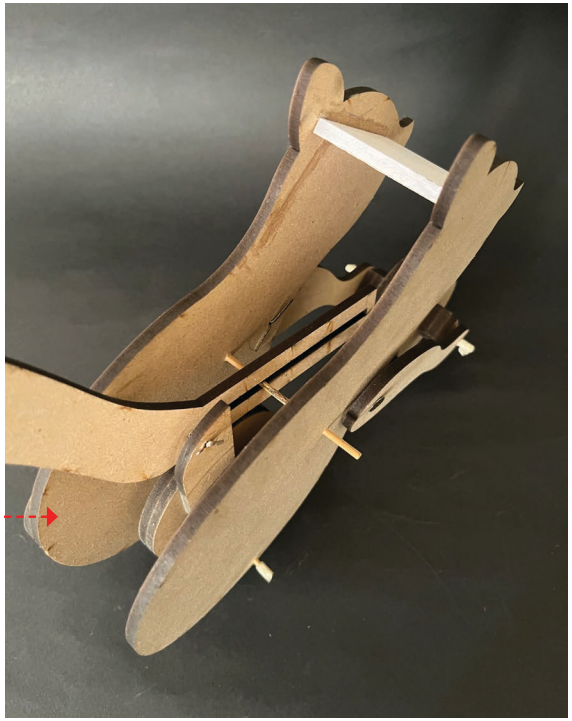


Tail Motion Mechanism:

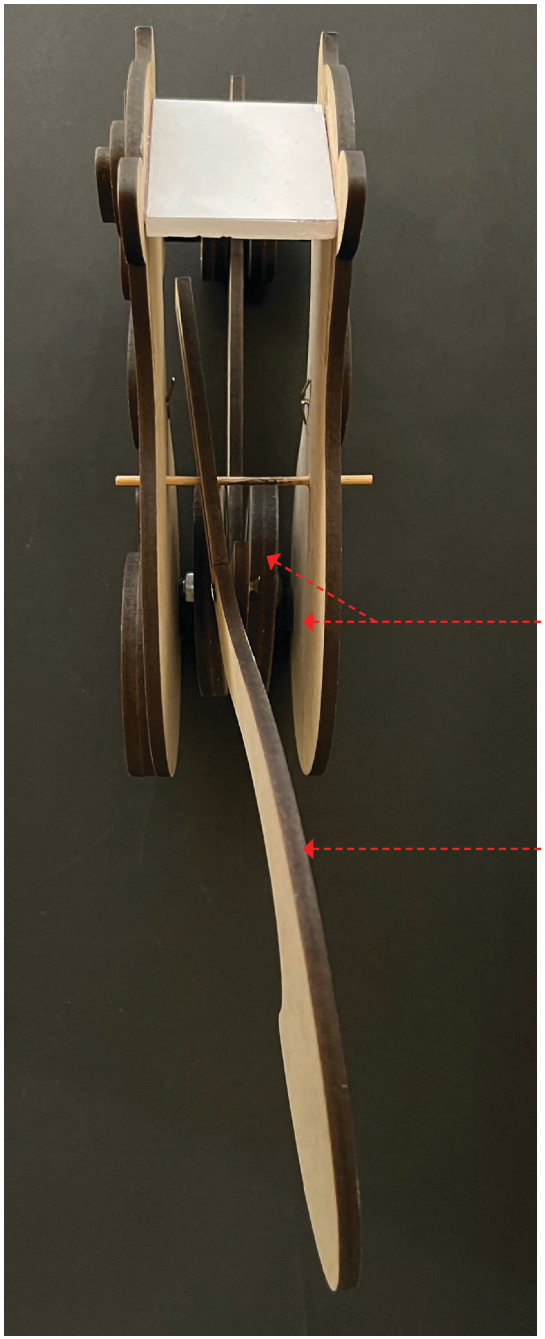




MDF thickness selected to be 5mm.



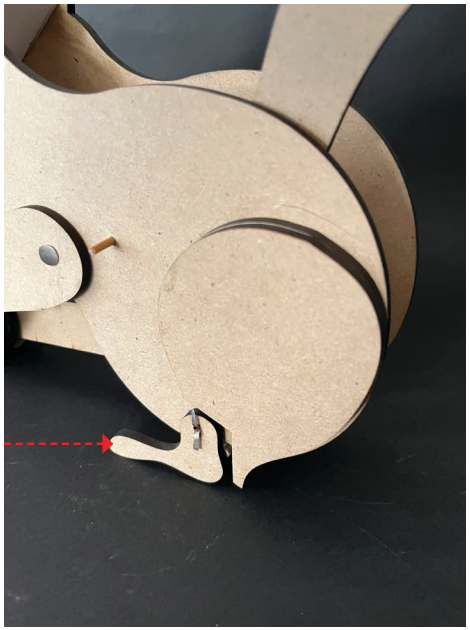
Model Features

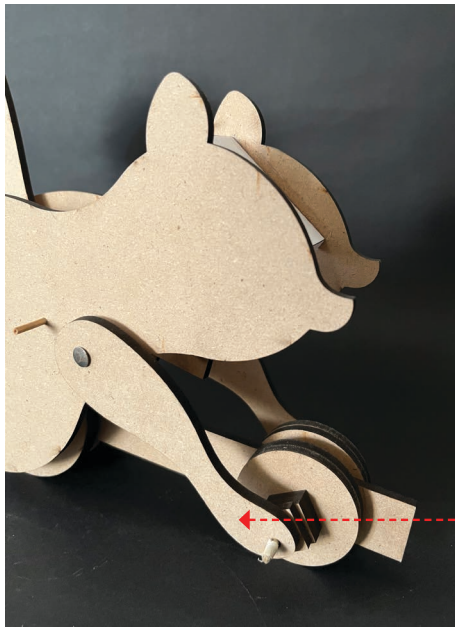


Rear feet pivoted to the rear legs freely moving to add on to the jumping action.

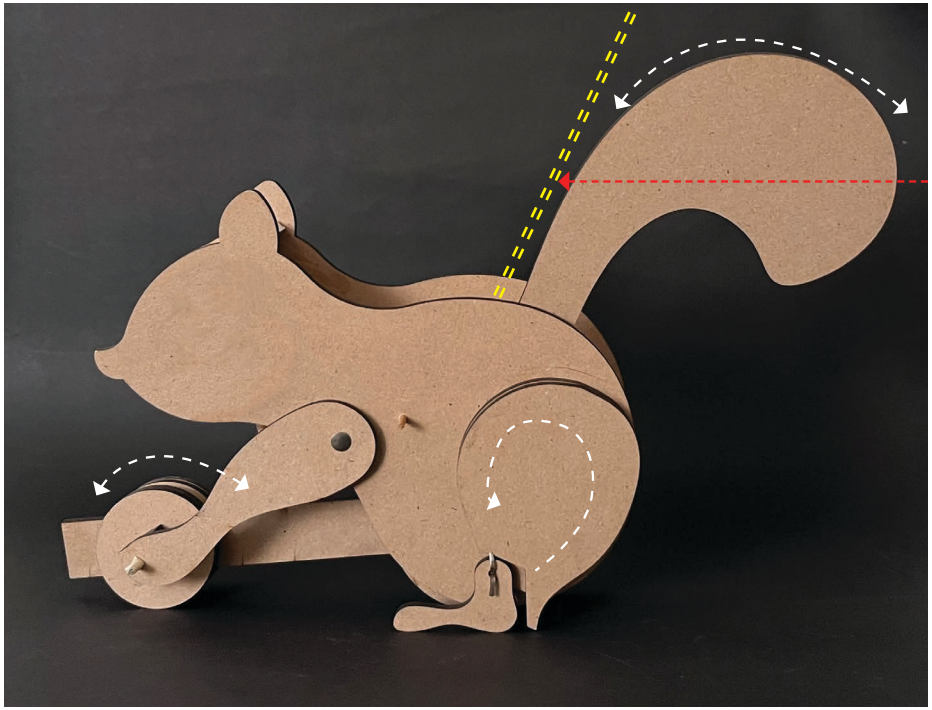
Rear body having off-centered connection with the rear wheels facilitating jump motion.

Tail jumping up and down as toy is pushed forward.





Front leg pivoted to the body moves to and fro as the toy moves forward.

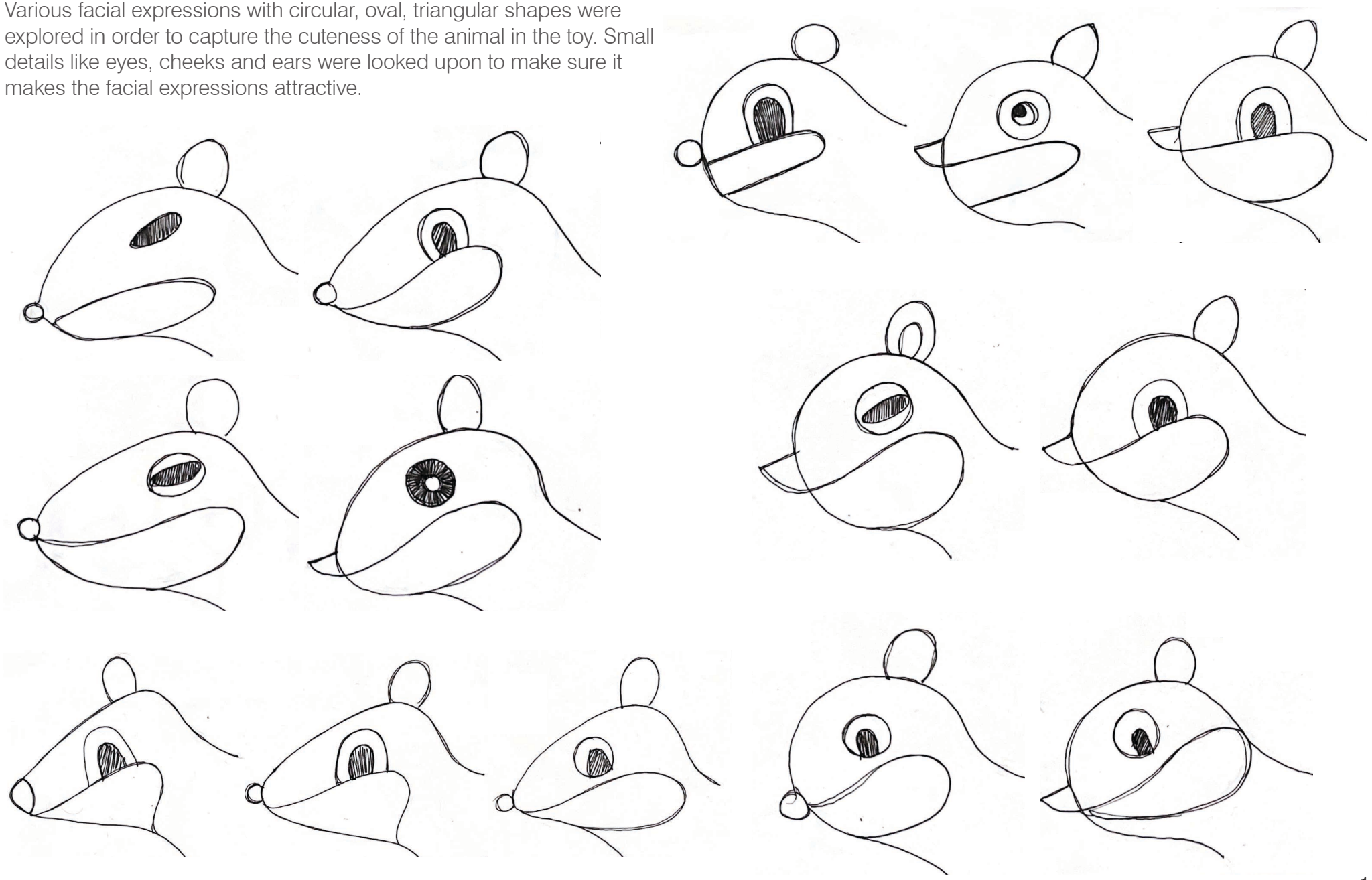


Push toy with a rod and handle provided in order to apply force to make the toy move forward .

Formal Variations

Facial Expressions:

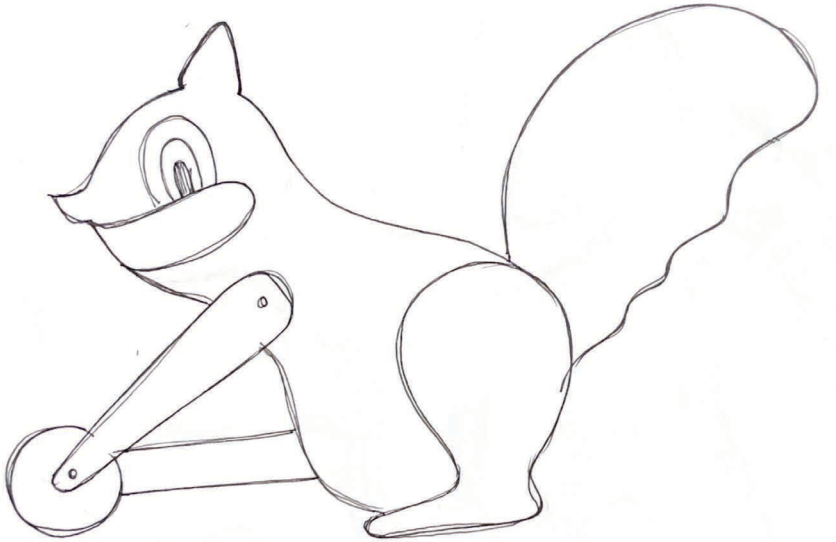
Various facial expressions with circular, oval, triangular shapes were explored in order to capture the cuteness of the animal in the toy. Small details like eyes, cheeks and ears were looked upon to make sure it makes the facial expressions attractive.

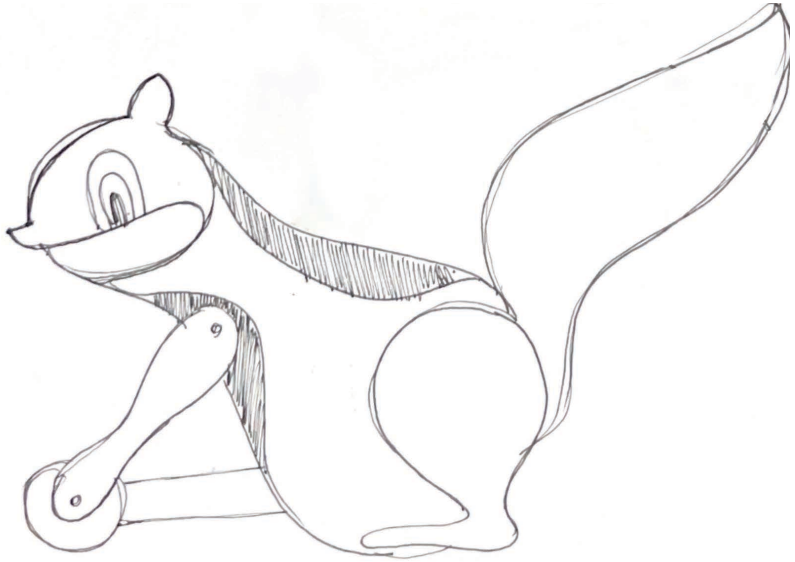


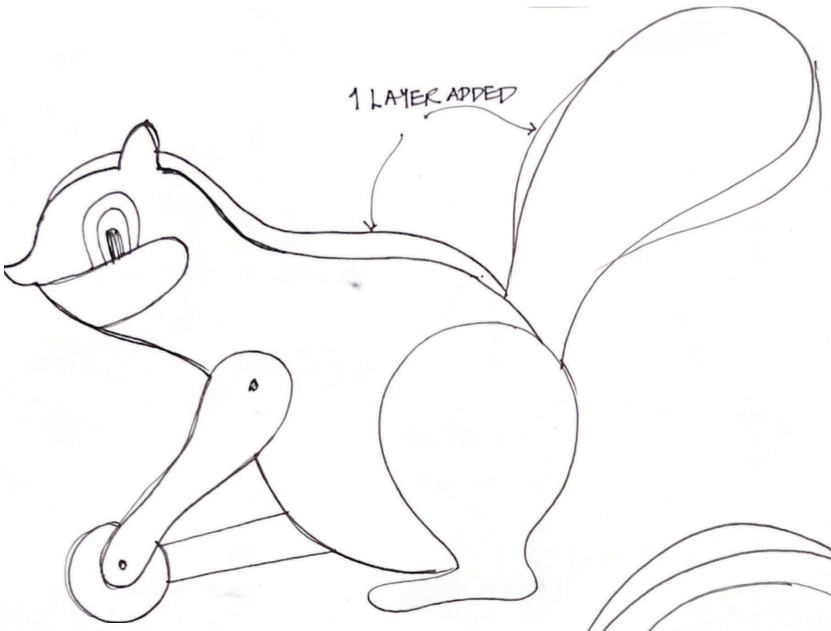
Formal Variations

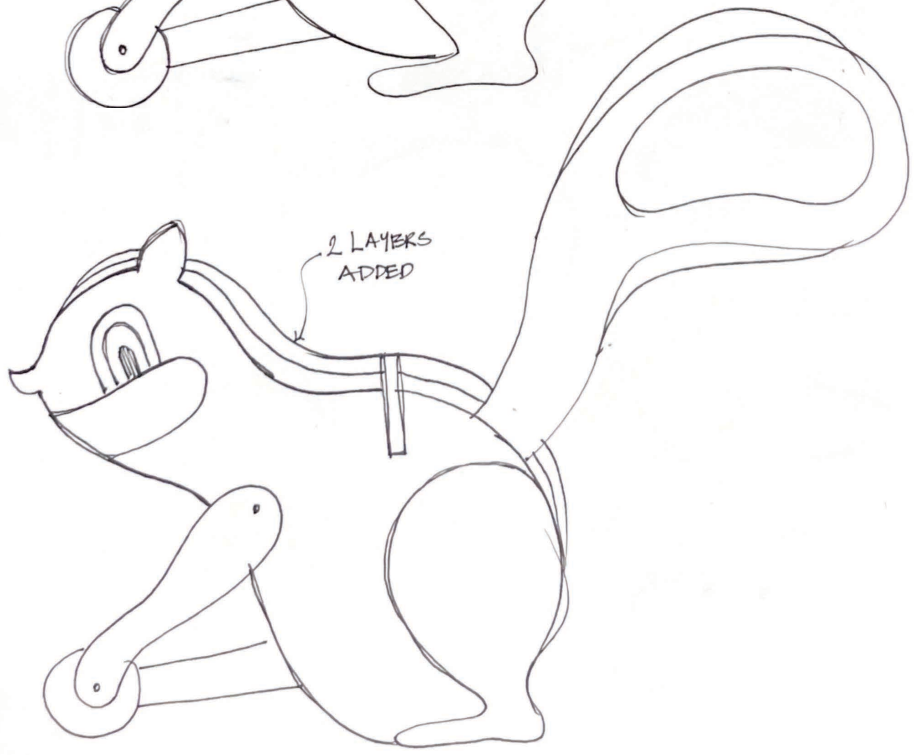
Body Postures:

Multiple options for the body, legs and the tail were explored to achieve the best visual experience. Three layers were added between the outer faces of the body in order to depict the three stripes observed on the squirrel back.









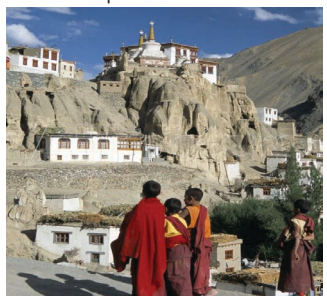
Colour Variations

Colours were inspired from Ladhaki cultures and traditions.

Monastry

Landscape

Landscape



Dance and Culture

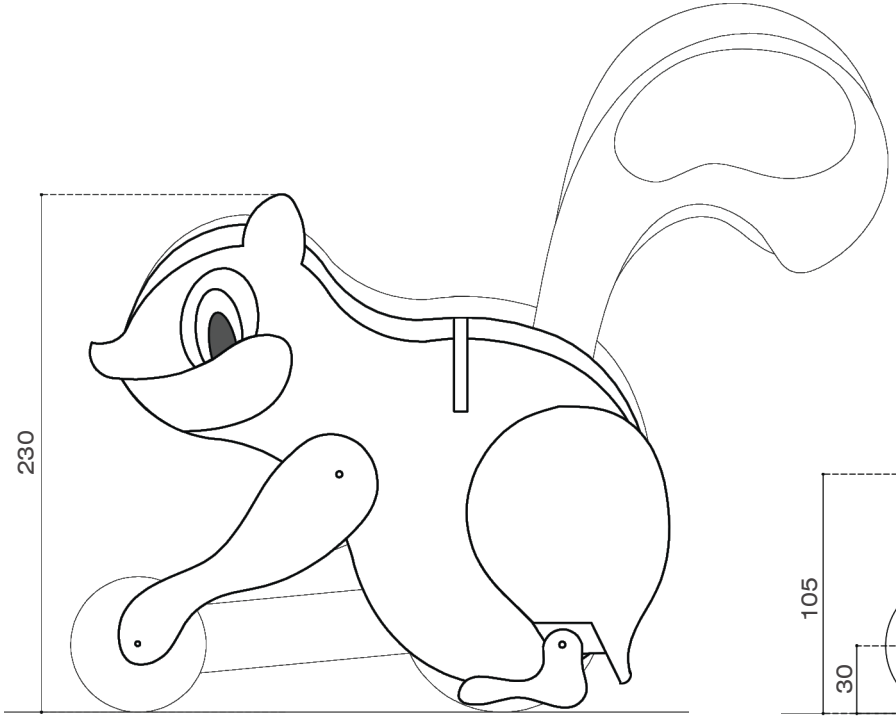
Architecture

Architecture

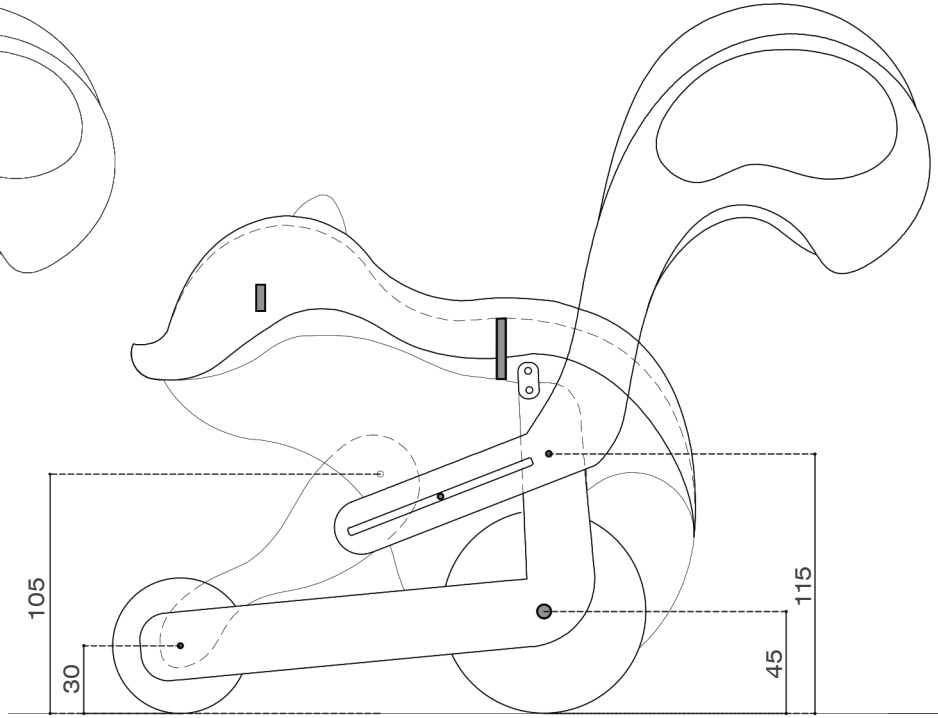
Final Design

Technical Drawing

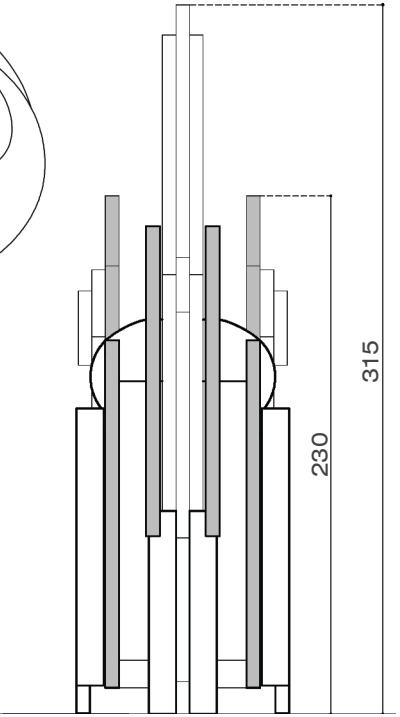
Note: All the dimensions are in mm.



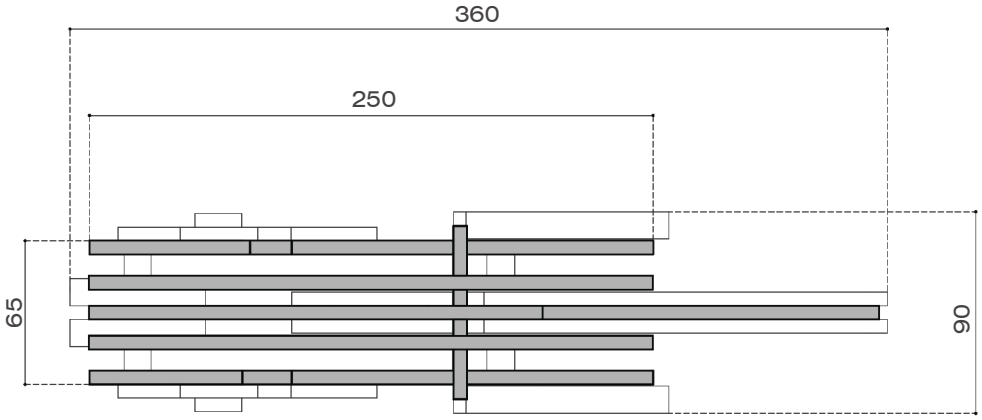
Elevation



Section

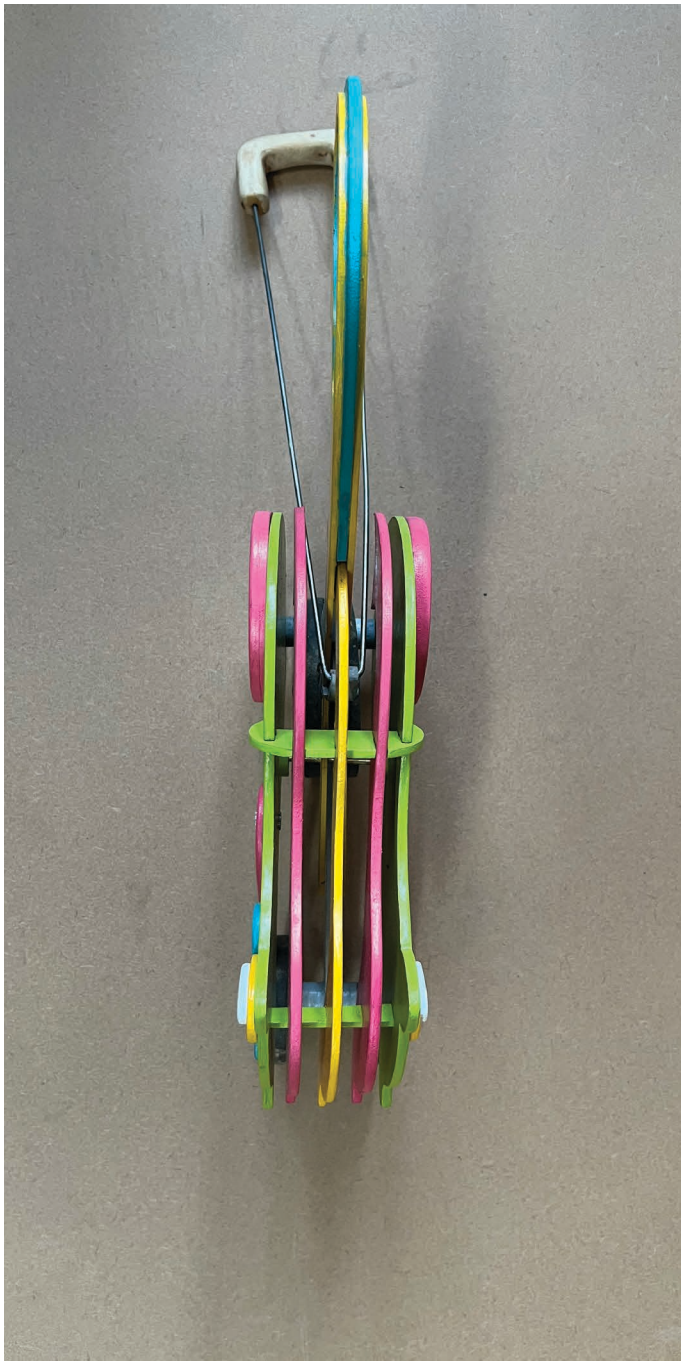


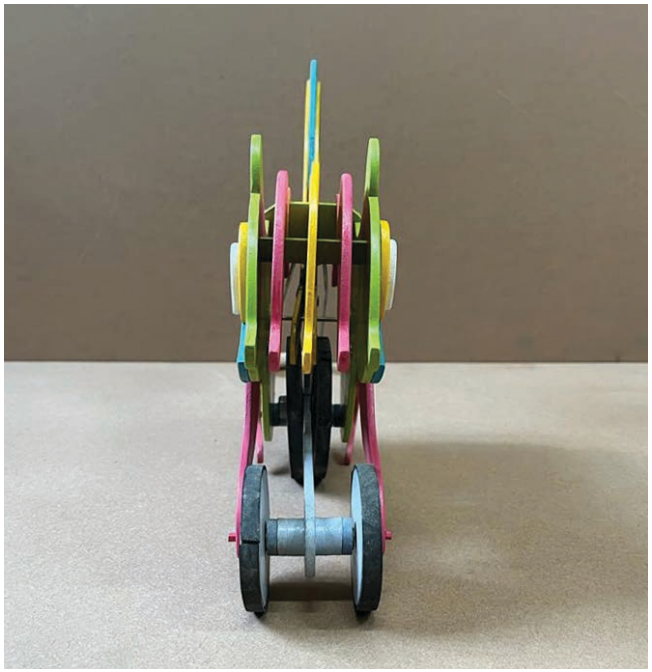
Rear Elevation



Plan

Final Model





Learnings

Product Design 2 was a module which took me through rigorous process of thinking in order to develop a mechanism biomimicking the animal's movement and to incorporate it with a form that resembled the same animal. It made me to observe every detail and to be sensitive towards visuals in order to develop a toy considering the constraint of the provided brief. It helped me to follow a design process which started with sketching, making dirty prototypes, renders to final working prototype. It also taught me the branding perspective of a product as I worked on logo and the poster. Overall, the four weeks of the module took me through a fun and an intense process of design.

Thank You