

Design Course

## Indian Toy Design

Biomimicry-inspired toys

by

Prof. Vijay Bapat

IDC, IIT Bombay

Source:

<https://dsource.in/course/indian-toy-design>



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3. Difference Between Idea and Concept
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<https://www.dsource.in/course/indian-toy-design/introduction>

## Introduction

The course on designing kids' products for play environments using a biomimetic approach offers a unique and innovative perspective on product design. Under the guidance of Professor Bapat from IDC School of Design, IIT Bombay, the course challenges students to draw inspiration from nature to create toys and playground equipment that are not only functional and enjoyable but also sustainable, educational, and user-friendly. Biomimicry, the practice of solving human challenges by emulating the designs, processes, and systems found in nature, serves as the core framework for the course. Students are encouraged to explore the biomechanics, physiology, and movement patterns of animals and birds, applying these observations to the design process.

Throughout the course, students are split into two groups, each tasked with designing one of two types of products: push toys or ride-on toys and playground equipment. These designs must incorporate biomimetic principles by analyzing natural movements, structures, and systems, and then translating these ideas into innovative play products. The course emphasizes a hands-on, iterative approach to design, with stages that include user research, market analysis, ideation, prototyping, and final concept presentation.

The course also involved a great deal of iteration, from concept evaluation and form exploration to the detailing of graphics, branding, and promotional materials. Students were challenged to refine their designs and present their final concepts in a professional manner, showcasing the biomimetic inspiration behind each toy while ensuring that each design was easy for children to use and enjoy.

Through this process, students gained valuable insights into how biomimicry can inspire innovative, user-centered solutions in the field of children's product design, all under the expert guidance of Professor Bapat.





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<https://www.dsource.in/course/indian-toy-design/theme-course>

## Theme of the Course

The theme of the course revolves around designing innovative, user-centered kids' products for play environments using a biomimetic approach. A key aspect of the course was the emphasis on a user-centric design approach, ensuring that the toys and equipment were not only functional and enjoyable for children but also safe, accessible, and aligned with their developmental needs. As part of their design process, students visited local toy shops and playgrounds to observe firsthand how children interact with various products and play structures. These visits provided valuable insights into the types of toys that engaged children and those that promoted movement, exploration, and creativity. In the toy shops, students closely examined existing designs, considering factors such as usability, safety features, and the appeal of each product. Similarly, by observing children at play in real-world playground settings, they gained a deeper understanding of how play environments can inspire imagination and physical activity.

Back in class, these observations were discussed and analyzed in group sessions, where students shared their findings and brainstormed ways to incorporate those insights into their biomimetic designs. The class discussions provided a platform for students to exchange ideas, critique each other's concepts, and refine their approaches, ensuring that their final products were both innovative and practical for children's needs.

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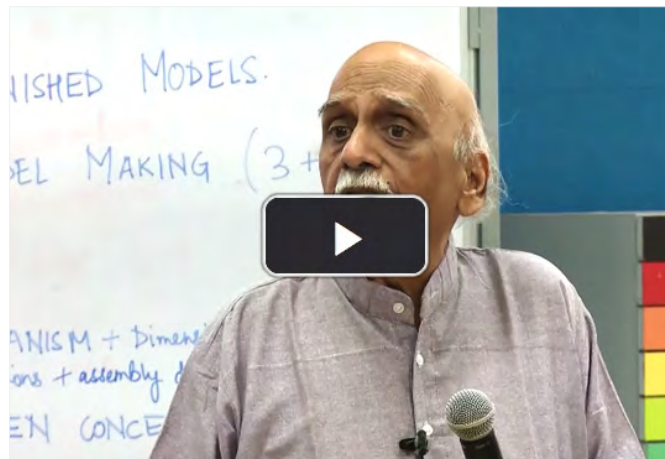
## Difference Between Idea and Concept

As the course progressed, Professor Bapat guided the students through a critical distinction: the difference between an idea and a concept. This distinction became a key turning point in the design process, helping students refine their thinking and advance their projects with greater clarity and focus.

After the first stage of the presentation, Professor Bapat explained that concepts are often combinations of ideas or the result of synthesizing and refining ideas. Concepts are actionable - they are manufacturable and have specific dimensions, material considerations, and user interactions. He emphasized that a concept goes beyond just the initial inspiration, turning it into something that can be developed into a real product. He illustrated this with example sketches created by students during Stage 1, showing how initial ideas could evolve into more structured and executable concepts.

Concept selection is a crucial step in the design process. It involves analyzing ideas, testing their feasibility, and determining which one has the potential to become a successful and practical product.

Additionally, Professor Bapat introduced the idea of biomimicry. When drawing inspiration from nature - such as birds or animals, it's not about simply copying what you see but rather transforming that inspiration into something new and exciting. Biomimicry involves developing concepts that evoke creativity and fantasy, rather than just replicating nature's designs. It's about understanding the underlying principles behind nature's solutions and applying them in a way that is functional, playful, and engaging for children.

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<https://www.dsource.in/course/indian-toy-design/product-design-insights>

## Product Design Insights

The project concludes with a comprehensive final presentation that showcases the students' design process and outcomes. This presentation typically includes functional or conceptual models, meticulously crafted design drawings, and a well-organized written report that documents the development and rationale behind the proposed solution.

Throughout the course, students engage in a series of in-depth discussions and practical exercises that explore each phase of the design process. Emphasis is placed on integrating systematic approaches with creative thinking to foster innovative and well-rounded solutions. To reinforce these concepts, students complete a variety of targeted assignments. These cover a wide range of topics, including creativity-enhancing techniques (such as brainstorming and synectics), identifying and framing design opportunities, problem analysis, visual idea generation through sketching, the creation of exploratory mock-ups, and methods for evaluating and refining design concepts.

Collectively, these activities are designed to guide students toward developing solutions that are not only functional and innovative but also thoughtful and visually compelling.



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Source:

<https://www.dsource.in/course/indian-toy-design/understanding-toy-mechanism>

## Understanding Toy Mechanism

Understanding toy mechanisms involves examining how toys work—from simple motion to more complex interactive features. At its core, this exploration reveals the principles of mechanical design, physics, and user interaction, all wrapped in a playful and accessible form.

A toy mechanism is the inside part of a toy that makes it move, spin, jump, talk, or do cool tricks. Think of it like the “muscles and bones” of the toy that help it move and interact with you.

Have you ever wondered how a toy moves, makes sounds, or lights up when you press a button or turn a crank? That’s all thanks to something called toy mechanisms! Let’s break it down and learn how toys come to life.

Toys use simple parts to do fun things. Here are some common ones:

**Levers** - Like seesaws, they help parts go up and down.

**Gears** - These are little wheels with teeth that turn each other. It help to move things in different ways and in different manner.

**Ratchets** - It allows the movement only in one direction. It can be used for making noise in different toys.

**Pulleys** - It is like gear but it has connecting member like thread. Transmission is through thread or belt. They give same direction rotation.

**Cams** - Special shapes that make parts go up and down when they turn.

**Cranks** - It is like a rotating wheel helping one element to move in straight line.

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Biomimicry-inspired toys

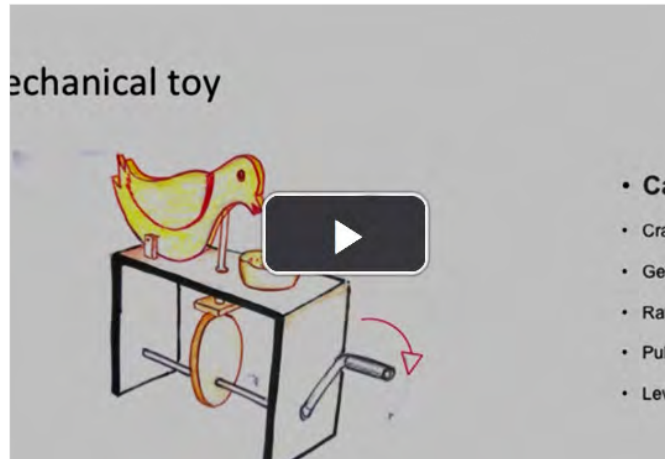
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## Students Presentations

Throughout the course, students were divided into two groups, each responsible for designing one of two types of products: push toys or ride-on toys. The designs were required to incorporate biomimetic principles, drawing inspiration from natural movements, structures, and systems. Students translated these natural observations into creative, functional play products. The course emphasized a hands-on, iterative approach, with stages including user research, market analysis, ideation, prototyping, and the final concept presentation.

The next phase focused on concept evaluation, form exploration, and detailing. Students assessed each design's functionality, aesthetic appeal, and safety features, ensuring that the toys met children's developmental needs. These toys were intended not only to encourage physical activity and imaginative play but also to provide children with an engaging way to learn about nature and the environment through the integration of biomimetic principles. In the final stages, students worked on creating professional graphics, branding, and posters to present their toys. These promotional materials highlighted the biomimetic inspiration behind each design and aimed to demonstrate how the toys could positively influence children's learning and play experiences, making the connection between fun and education clear and impactful.

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Push Toy - Group A



Ride-on Toy - Group B

Source:

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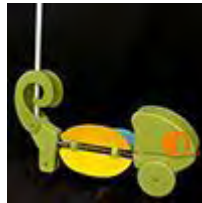
Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group>

## Push Toy - Group A

The exercise was assigned as part of the Product Design Module during the second semester of the Junior M. Des. Industrial Design course at IDC, IIT Bombay, under the guidance of Prof. Vijay Bapat. The class of 14 students was split into two groups of 7 each. Group A was tasked with designing a push toy for 9-15-month-olds, while Group B was tasked with designing a ride-on toy for 6-12-year-olds. Group A had the additional constraint of using only wood or processed wood as their material. The duration of the module was three weeks.

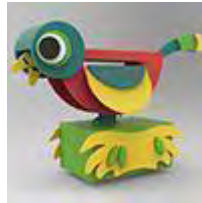
Group A choose to design push toy. Design Insights followed by Group A.....



Catchy  
by Anushree Banerjee



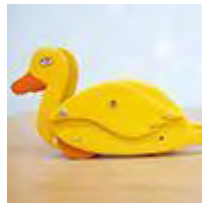
Roxy by Hari



Pakhi by Minal Agarwal



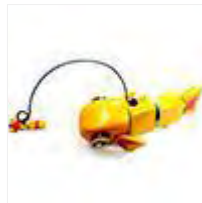
Rollerpede by Mridul Jain



Totter by Nikita Fatarpekar



Waliz by Nirmal P J



Toto by Rajat



Chani by Aamod Narkar

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6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag, 6Ah

6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

#### 6B. Ride-on Toy - Group B

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6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag, 6Ah

6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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Rolly by Ashuj Chawda



Sting Ray by Infant Bibin I



Buzz by Mugdha Dengle



Go Bananas by Parth Rathod



Pambo by Sagar D Dabherao



Cunth by Snehal Gaikwad



Chef Olie by Athira E



Akira  
by Mohammed Hazique Kola



Tooti by Naiga Catherine



Buba  
by Prathmesh Pedamkar



Muro by Shivani M



Taco by Susovan Gupta

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**Hooti**  
by Uppili Nithin Soorya B



**Piku** by Vaibhav Watile

Source:

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    - 6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap
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<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/catchy-anushree-banerjee>

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa. Catchy by Anushree Banerjee

6Aai. Stage 1 Presentation

6Aaii. Case Study - Slide Show

6Aaiii. Poster

6Aaiv. Video

6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag, 6Ah

6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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## Catchy by Anushree Banerjee

Anushree wants to create a push toy for children aged 9 to 15 months that uses nature-inspired design (biomimicry). The toy should help kids recognize colors and patterns through its movement and feedback. It should also surprise them in a fun way.

She is drawing inspiration from chameleons or hummingbirds. Safety is crucial, so the toy's shapes, materials, and size of pieces must be child-friendly and durable. It should keep the child engaged for a long time.

One idea is 'Catchy the Chameleon,' a toy that kids can push or play with. The main action is its mouth opening to catch a 'fly' with its tongue. It also features rotating color disks for interactive play while sitting. The toy aims to improve fine motor skills and cognitive learning by teaching color and pattern recognition."



Stage 1 Presentation



Poster



Case Study - Slide Show



Video



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Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/catchy-anushree-banerjee/stage-1>

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6A. Push Toy - Group A

6Aa. Catchy by Anushree Banerjee

6Aai. Stage 1 Presentation

6Aaii. Case Study - Slide Show

6Aaiii. Poster

6Aaiv. Video

6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag, 6Ah

6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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## Stage 1 Presentation

Download:

• [Catchy\\_Stage 1 Presentation\\_by Anushree Banerjee.....](#)

# Product Design-2

Anushree Banerjee  
176130012

**Problem Statement**

"To Design a **wooden toy** for kids of age **9 – 15 months** using **Biomimicry** "

**Design Process**

**User Research**

- We conducted interviews of parents of the target groups.
- We observed the toys available in Heeranandani market, R City – Hamleys.
- We read about child psychology and role of toys in the development of kids
- Coming up with important insights.

**Biomimicry**

Color changing Chameleon  
Jumping Dolphin  
Birds Flapping

**Design Brief**

To design a **push toy** using **biomimicry** for kids of age 9-15 months, which facilitate **colour and pattern recognition** through **multi axis motion** and **visual and tactical feedbacks** as a tool.

The toy should evoke an **element of surprise**.

I would like to take inspiration from the attributes of a **chameleon** or a **humming bird**.

The toy must be safe in terms of forms, material and size of the pieces. It should hold the interest of the child for a longer time.. It should with stand wear and tear .

**Brainstorming**

How many ways we can make kids want to play with the toy?

Adorable	Interaction	Story
Cute	Character	Weird
Follow	Friend	Hit
Patterns	Mimic	Vibrant
Routine	Flipping	Prize
Flying	Motion	Light
Touch		

**Initial Sketches**

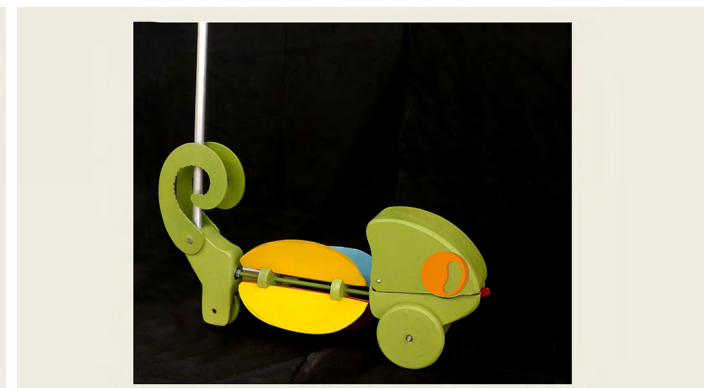
**Chameleon**  
Color Changing Disk  
**Chameleon**  
Cam Assisted Way Back  
**Chameleon**  
Rotating cylinders

**Initial Sketches**

**Humming Bird**  
Bird Flapping Wings  
**Humming Bird**  
Bird flying to the child

**Initial Sketches**

**Dolphin**  
Dolphin jumping on the wave



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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa. Catchy by Anushree Banerjee

6Aai. Stage 1 Presentation

6Aaii. Case Study - Slide Show

6Aaiii. Poster

6Aaiv. Video

6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag, 6Ah

6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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## Poster





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6A. Push Toy - Group A

6Aa. Catchy by Anushree Banerjee

6Aai. Stage 1 Presentation

6Aaii. Case Study - Slide Show

6Aaiii. Poster

6Aaiv. Video

6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag, 6Ah

6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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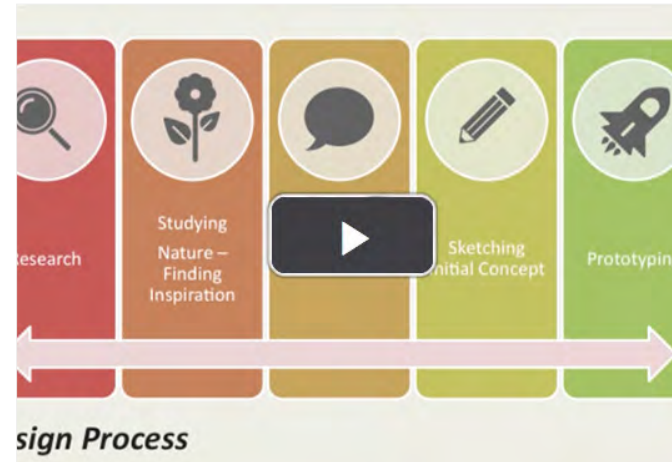
8. Links

9. Video

10. Contact Details

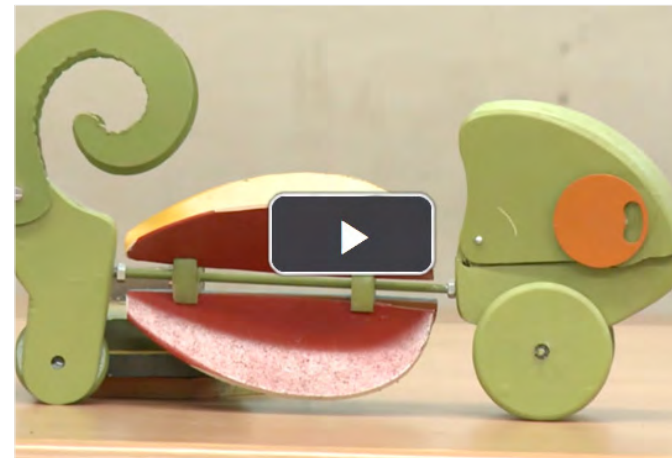
## Video

Presentation Stage 1 by Anushree Banerjee



YouTube Video Link.....

Catchy by Anushree Banerjee



YouTube Video Link.....

Toy Design Mechanism by Anushree Banerjee



YouTube Video Link.....



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<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/roxy-hari>

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6A. Push Toy - Group A

6Aa. Catchy by Anushree Banerjee

6Ab. Roxy by Hari

6Abi. Stage 1 Presentation

6Abii. Case Study - Slide Show

6Abiii. Poster

6Abiv. Video

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6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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## Roxy by Hari

Hari aims to create a push toy catering to children aged 9-15 months, drawing inspiration from nature through Bionics and Biomimetic principles. This approach involves analyzing animal movements and physiology to integrate them into the toy's final design. The design objectives include ensuring the toy is suitable for mass production at an affordable cost. It must be age-appropriate, child-safe (using non-toxic materials), well-crafted (free of sharp edges and paint that may peel), easy to operate, and visually appealing. Moreover, durability is a key consideration to withstand everyday wear and tear.

It is the ROXY® philosophy that 'good quality play' enriches a child's life and lays the foundation for later adult life. We believe that play is a key element in children's growth and development and stimulates the imagination and the emergence of ideas and creative expression. All ROXY products are based on this underlying philosophy of making your child's life a beautiful experience.



Stage 1 Presentation



Poster



Case Study - Slide Show



Video

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6A. Push Toy - Group A

6Aa. Catchy by Anushree Banerjee

6Ab. Roxy by Hari

6Abi. Stage 1 Presentation

6Abii. Case Study - Slide Show

6Abiii. Poster

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6Ac, 6Ad, 6Ae, 6Af, 6Ag, 6Ah, 6Ai,

6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

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## Stage 1 Presentation

Download:

- [Roxy\\_Stage 1 Presentation\\_by P Sri Hari.....](#)

DE 608:PRODUCT DESIGN – 2

TOY DESIGN

P SRI HARI

76130008

### Physical Changes:

- Confident **walker**
- Adjusts **posture** as he/she moves
- Follows your **gaze**
- Dexterity** in hands

### Design Inspiration:

**Dogs** are animals, but they have a special place in the hearts of many adults and children. If appropriately trained and supervised, dogs can provide many valuable lessons and other benefits to children.



Figure 3: Relation between children and dogs. Accessed on 10 April, 2018 <<https://www.kennelpedia.com/kids-dogs-1-matching/>>

### PROBLEM STATEMENT:

Design a push toy for children of age 9-15 months. The design must take inspiration from nature by using **Bionic** and **Biomimetic** principles to analyse the movements physiology of animals and incorporate them in final design.

### Cognitive changes:

- Deliberate **exploration**
- Entertaining** him/herself
- Understanding **language**
- Using deliberate **gestures**

### DOGS MOOD ANALYSIS:

Observing the “whole dog” at a distance can give you a quick and general idea of the dog’s mood.



Figure 3: Mood analysis of dogs. Accessed on 10 April, 2018 <<http://www.bonafidesites.com/hearing-to-speak-dog-part-4-reading-a-dogs-body/>>

### Literature Review:

The following are **physical, cognitive, social** and **emotional** changes that occur in children of 9-15 months.



Figure 1: Interesting Facts about Child Development. Accessed on 10 April, 2018 <<https://www.bonafidesites.com/child-development-facts/>>

### social and emotional changes:

- Shows **affection** (Hugs, smiles, kisses etc.,)
- Mimics** Actions
- Recognizes** familiar faces
- Babbles** with inflections of actual languages

Once you have a general idea after observing the dog as a whole, you can zoom in on individual body parts that will often give you key clues on the dog’s emotional state.

### ARS:



Figure 4: Mood analysis of dogs based on ears. Accessed on 10 April, 2018 <<http://www.bonafidesites.com/hearing-to-speak-dog-part-4-reading-a-dogs-body/>>

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# Indian Toy Design

Biomimicry-inspired toys

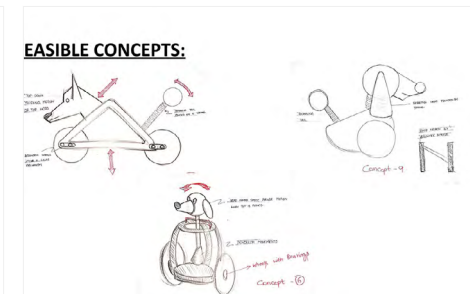
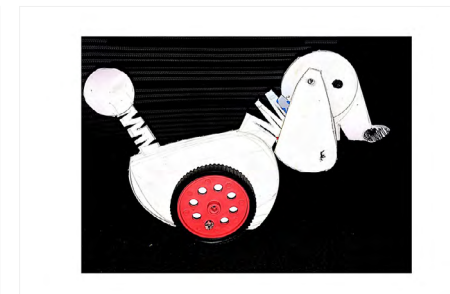
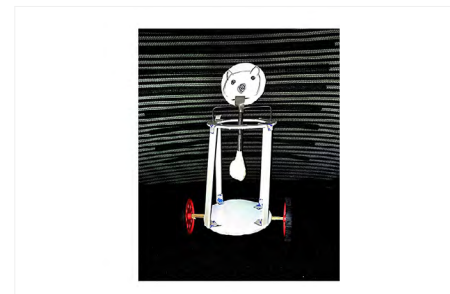
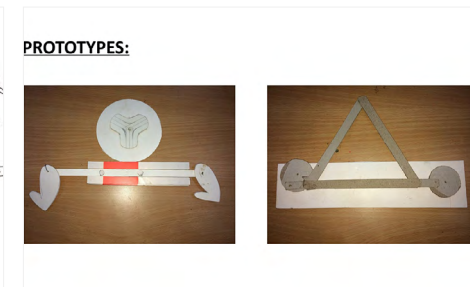
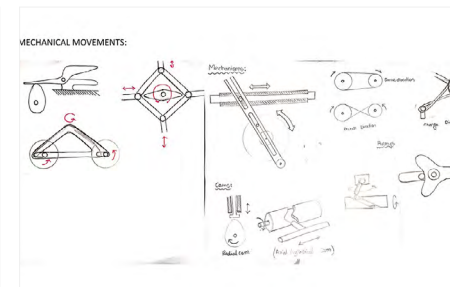
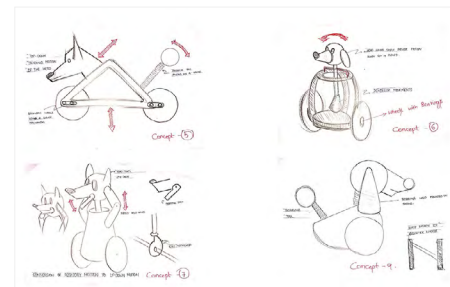
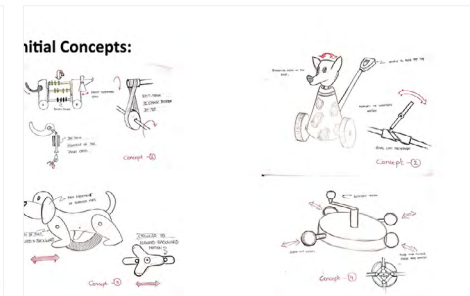
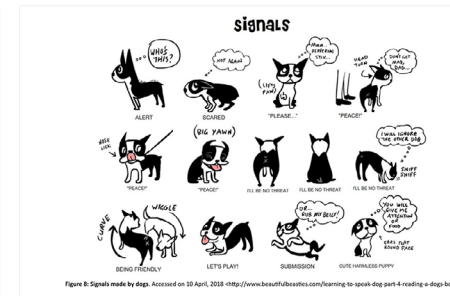
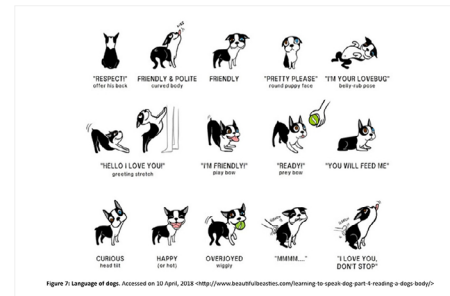
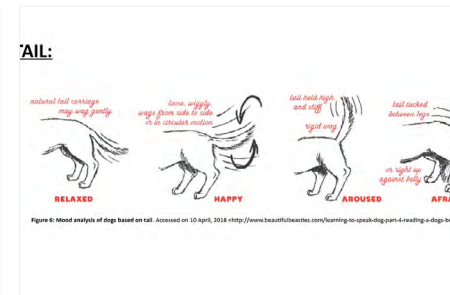
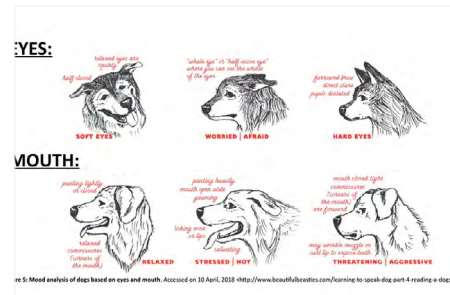
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IDC, IIT Bombay

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa. Catchy by Anushree Banerjee

6Ab. Roxy by Hari

6Abi. Stage 1 Presentation

6Abii. Case Study - Slide Show

6Abiii. Poster

6Abiv. Video

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6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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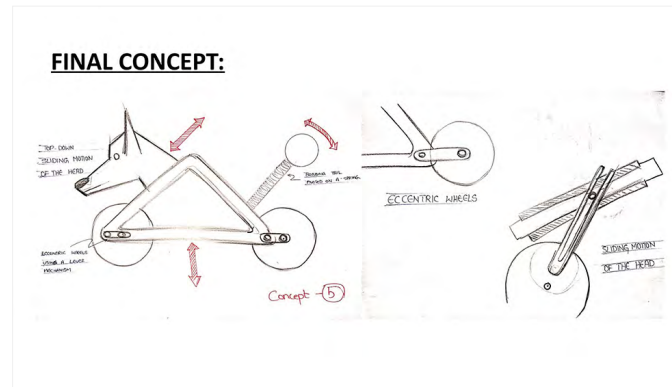
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by

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# THANK YOU

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6B. Ride-on Toy - Group B

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## Case Study - Slide Show

Case Study Download:

- **Roxy\_by P Sri Hari.....**
- **Roxy\_by P Sri Hari\_Report.....**



### INDEX:

1. Introduction .....	1
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### 1. Introduction:

India has a splendid tradition and history of wooden toys since 5000 years. Toys are known as the timeless creation which guides children to adulthood. Wooden toy making is part of every state's art and culture in India, but only few place work is most famous and followed as traditional craft from centuries. The toys are made by assembling flat shaped solid wood. Wood is shaved or carved into desired toy shape. The cutout pieces are finished on a sander, painted and assembled.



The earliest wooden toys date from sometime during the Stone Age (2.9 million years ago-2030 BC) in Africa and were simple models of useful implements such as clubs, axes and bows

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as well as dolls, intended to teach children critical survival and family skills and as a secondary intention to entertain them. Egyptian and Grecian cultural studies show evidence of the creation of less practical and more entertaining toys - from basic playthings fashioned by craftspeople for family members to extraordinary artisanal examples commissioned by the wealthier members of society for privileged children. Commercial manufacture of wooden toys on a small scale began during the middle ages in small shops, with industrial manufacture commencing in the 1800's especially in Germany and Northern Europe.

21 Page

### 2. Design brief:

Design a push toy for children of age 9-15 months. The design must take inspiration from nature by using Biomimics and Biomimetic principles to analyze the movements, physiology of animals and incorporate them in final design.

A toy that mimics the shape/ motion of a creature/object in the nature. Actuation mechanisms are to be introduced to mimic the functions of natural objects like walking, talking, making expressions and exhibiting behavior.

To design a toy that can be mass produced with in affordable cost. Age appropriate toy. Child safe toy (Toxic free materials). Well made (No sharp edges, paint peeling etc...). The toy should be easy to operate and visually approachable. The toy should be able to withstand wear and tear.

31 Page

### Cognitive changes:

- Deliberate exploration
- Entertaining him/herself
- Understanding language
- Using deliberate gestures

### Social and emotional changes:

- Shows affection (Hugs, smiles, kisses etc...)
- Mimics Actions
- Recognizes familiar faces
- Babbles with inflections of actual languages

51 Page

### 4. Design inspiration:

Dogs are animals, but they have a special place in the hearts of many adults and children. If appropriately trained and supervised, dogs can provide many valuable lessons and other benefits to children.



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### 3. Literature study:

The following are physical, cognitive, social and emotional changes that occur in children of 9-15 months.



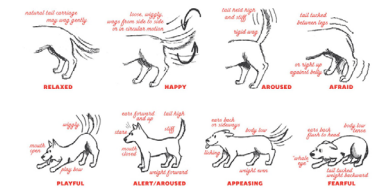
### Physical Changes:

- Confident walker
- Adjusts posture as he/she moves
- Follows your gaze
- Dexterity in hands

41 Page

### Dogs mood analysis:

Observing the "whole dog" at a distance can give you a quick and general idea of the dog's mood.



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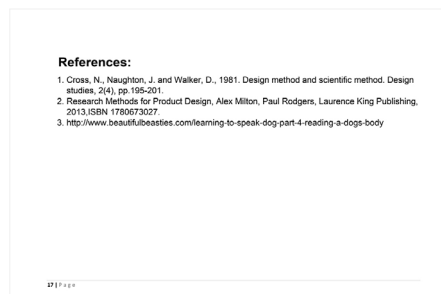
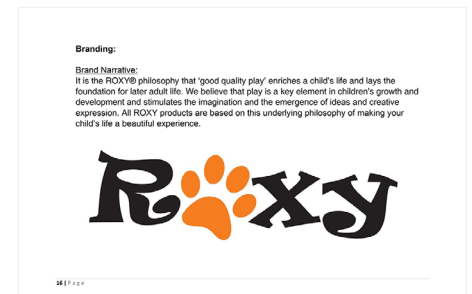
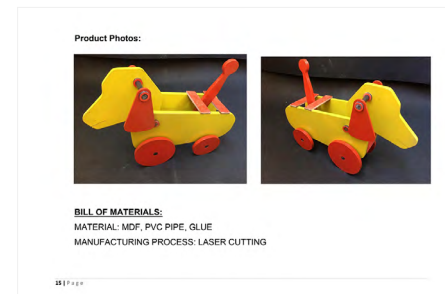
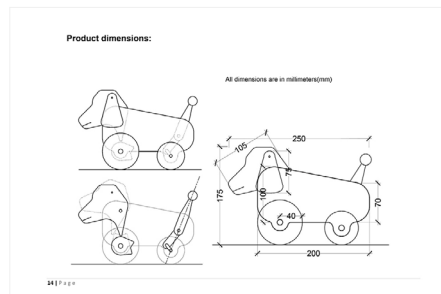
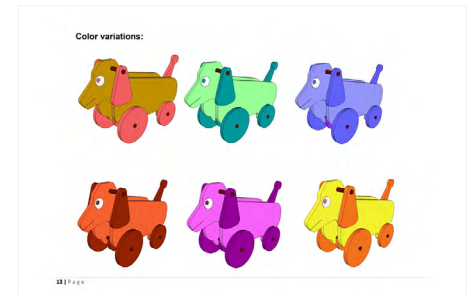
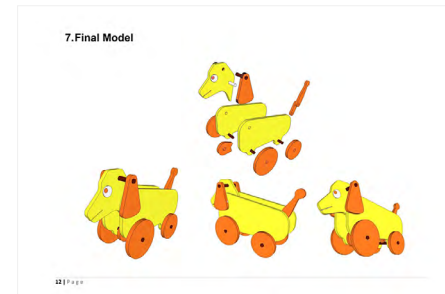
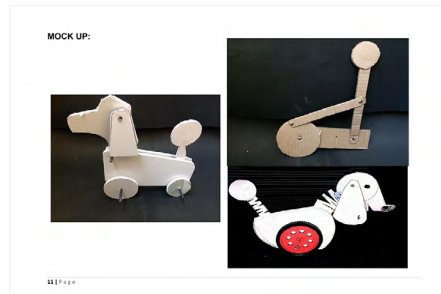
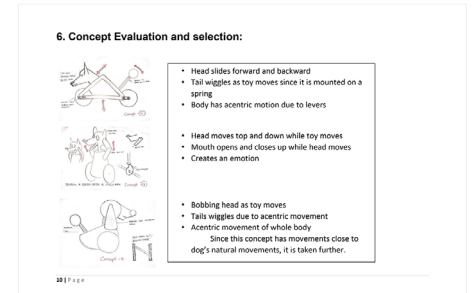
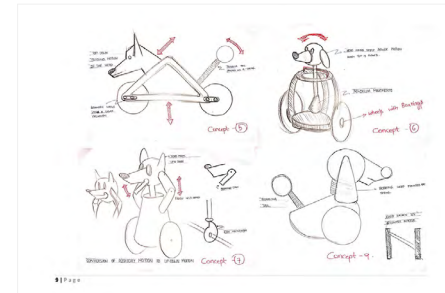
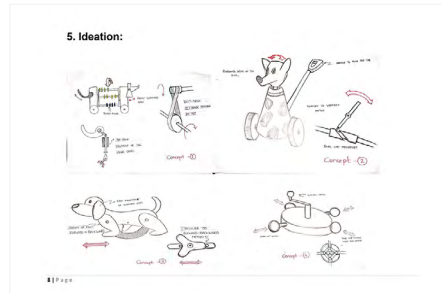
## 6B. Ride-on Toy - Group B

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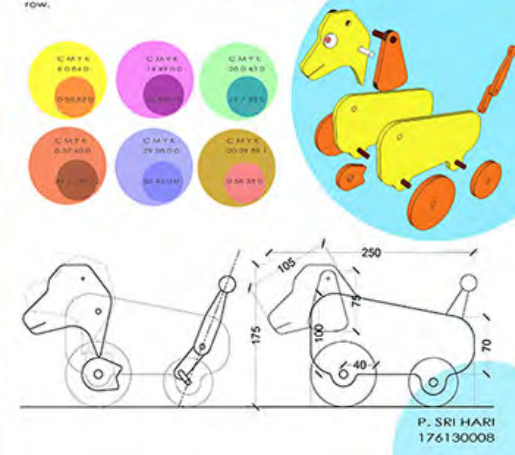
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## Poster



### Brand Narrative:

It is the ROXY® philosophy that 'good quality play' enriches a child's life and lays the foundation for later adult life. We believe that play is a key element in children's growth and development and stimulates the imagination and the emergence of ideas and creative expression. All ROXY products are based on this underlying philosophy of making your child's life a beautiful experience. True to its motto 'Only the best is good enough', the ROXY has been emphasizing the importance of high quality and safe products have remained the focal point for the ROXY throughout the years - and it still is. ROXY products are tested rigorously to live up to the strictest safety and quality standards as well as our own high expectations. This approach has made children and adults return to ROXY products time and again. The ROXY company is committed to caring for the environment and the society that children will inherit, and to inspiring and developing the builders of tomorrow.



1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

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## Video

### Presentation Stage 1 by Hari

YouTube Video Link.....

### Final Presentation by Hari

YouTube Video Link.....

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab

6Ac. Pakhi by Minal Agarwal

6Aci. Stage 1 Presentation

6Acii. Case Study - Slide Show

6Aciii. Poster

6Aciv. Video

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## Pakhi by Minal Agarwal

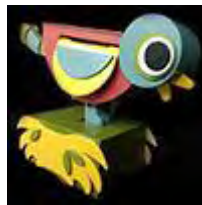
Minal aims to design a wooden push toy targeting children aged 9-15 months. The toy must stimulate curiosity, prioritize safety in use, and excel in form, function, and materials to ensure durability against wear and tear. Additionally, it should be visually engaging and accessible.

The toy should be versatile, offering multiple usage options or transformable features. It should encourage physical development through the child's movement during play and incorporate an element of unpredictability.

Drawing insights from user studies, market research, and bionic inspirations, our ideation process began. Initial concepts drew inspiration from interactive animal tails such as those of monkeys, squirrels, raccoons, and scorpions, as well as observations of animals like the glass frog and the red bird of paradise. Ultimately, the concept of a bird emerged as the chosen design direction.



Stage 1 Presentation



Poster



Case Study - Slide Show



Video



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6A. Push Toy - Group A

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6B. Ride-on Toy - Group B

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## Stage 1 Presentation

Download:

• [Pakhi\\_Stage 1 Presentation\\_by Minal Agarwal.....](#)

Product Design –II

Toy Design for kids taking Bionic Inspiration (9 to 15 months)

Minal Agarwal  
176130002

Characteristics of the toddler

- Newly mobile and more vocal, the kid is full of enthusiasm and—sometimes—a very strong will.

**PHYSICAL**  
Become a confident walker

**Early learning**


**SOCIAL & EMOTIONAL**  
Show affection with hugs, kisses, smiles and pats

**COGNITIVE**  
Be better at entertaining herself, and more deliberate in exploring


Making them learn more

- Boost confidence. Help a new walker practice balancing and walking by encouraging him/her to bring a toy along on little excursions through the house. It will boost her confidence until he/she's more secure with his/her balance.

tion and reaction  
use and effect  
and off  
sh and pull




icking  
ect of music  
gnizing sounds  
ining about shapes  
ubets and numbers




erview 1

- Sumaira, 9 months
- Hanging toys
- Toys with movement
- Lights attract her
- Colors like red
- Or soft and squishy materials



erview 2

- Riyansh and Ridan, 18 and 12 months
- Love to play with kitchen utensils.
- Don't like playing with a single toy for long
- Prefer toys with keys, to see action and reaction
- They like to observe how parts use the toys.
- Few toys they get attached to.



erview 3

- Arya, 14 months
- Loves to play with stacking toys
- Soft toys
- Bright colors



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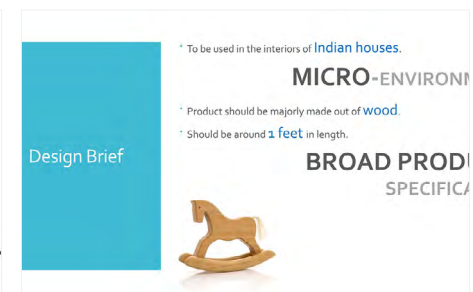
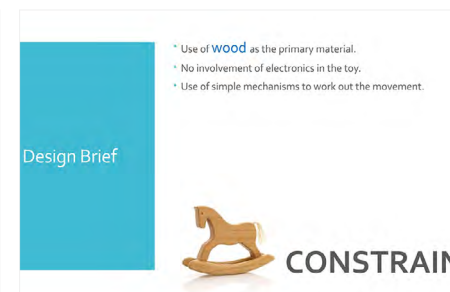
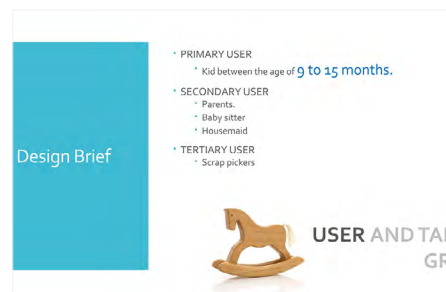
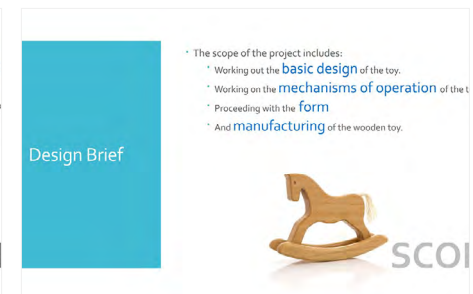
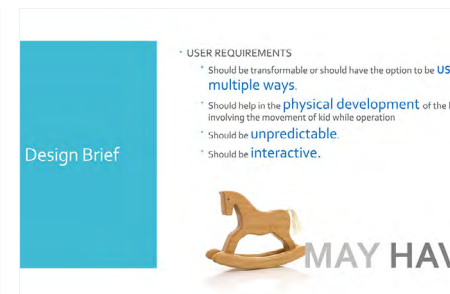
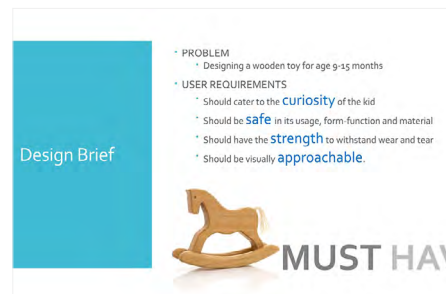
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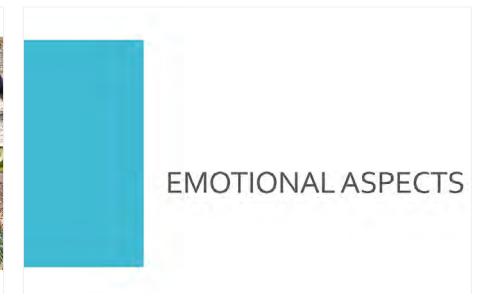
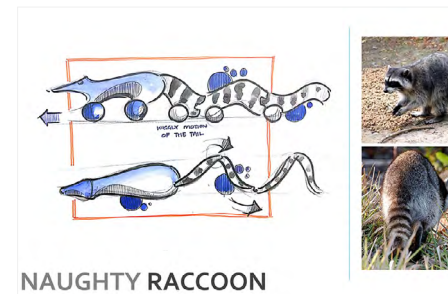
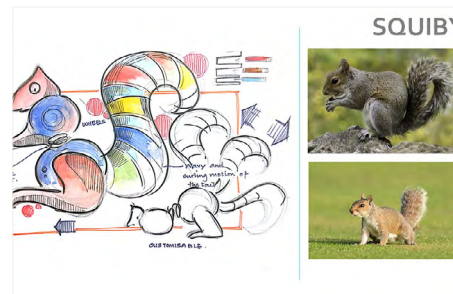
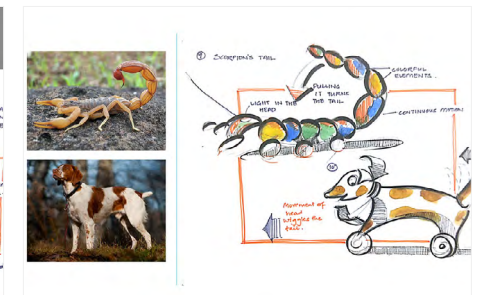
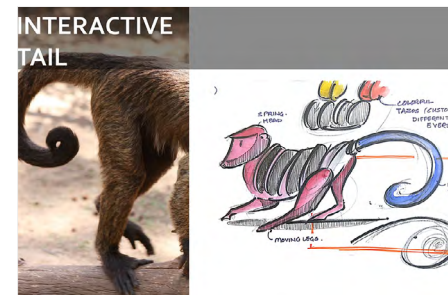
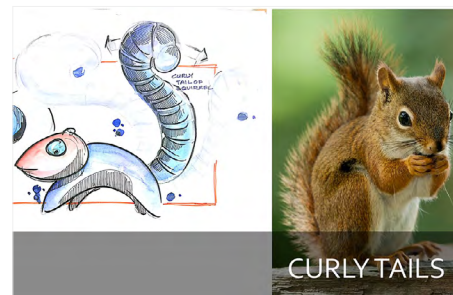
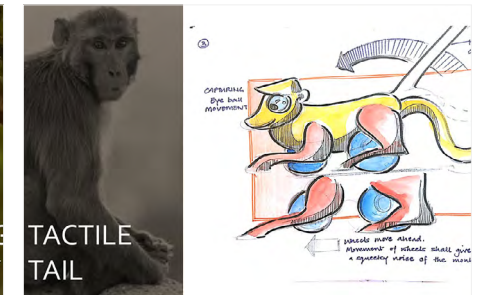
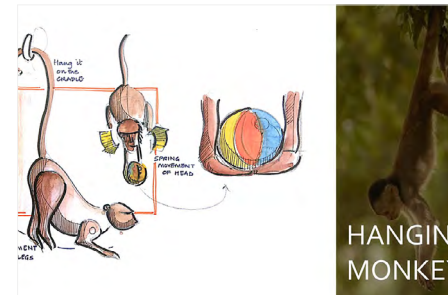
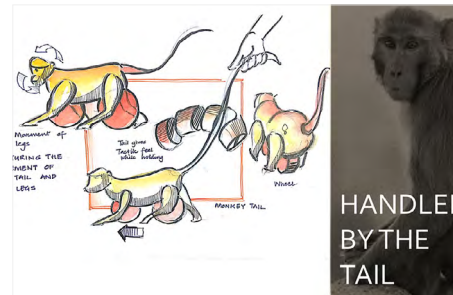
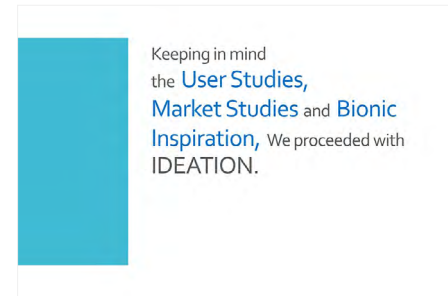
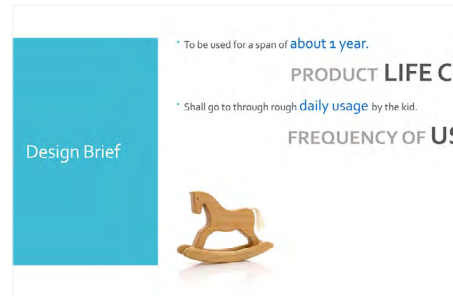
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<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/pakhi-minal-agarwal/stage-1>

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab

6Ac. Pakhi by Minal Agarwal

6Aci. Stage 1 Presentation

6Acii. Case Study - Slide Show

6Aciii. Poster

6Aciv. Video

6Ad, 6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj,

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

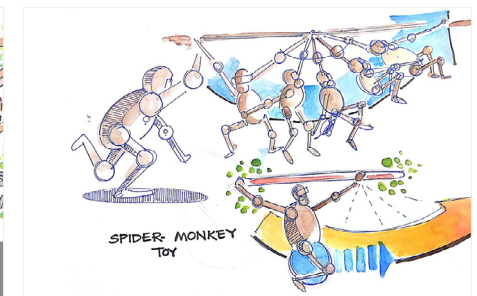
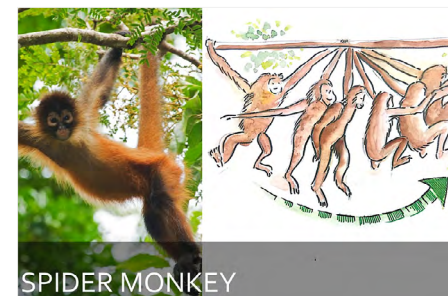
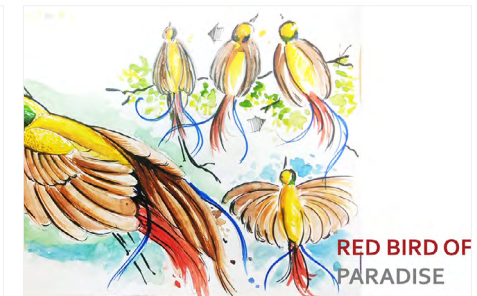
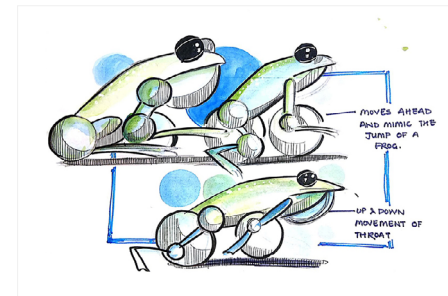
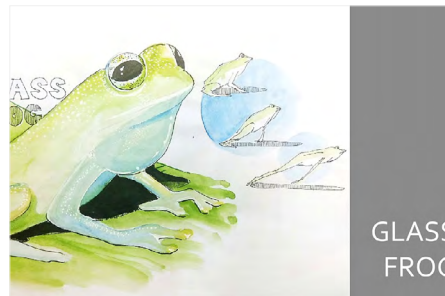
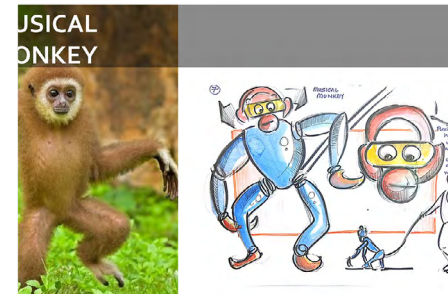
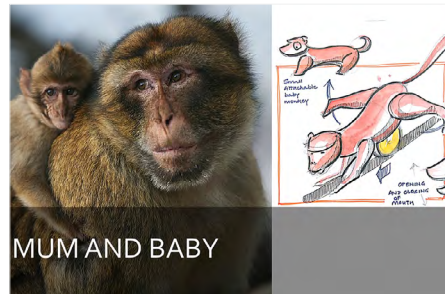
6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

10. Contact Details



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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

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6Aci. Case Study - Slide Show

6Aciii. Poster

6Aciv. Video

6Ad, 6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj,

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

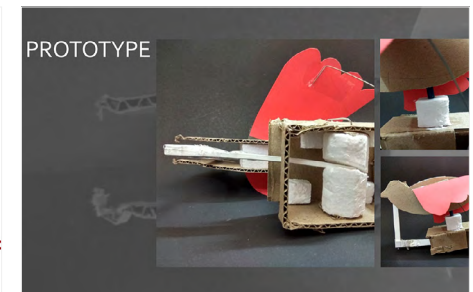
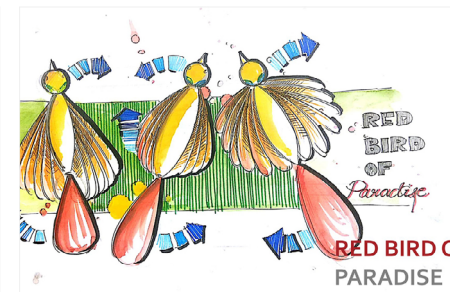
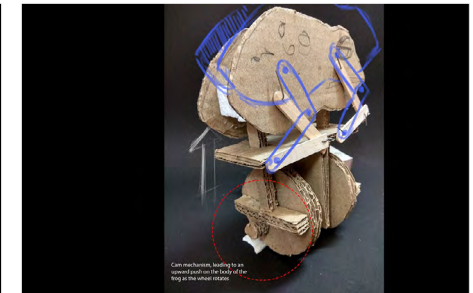
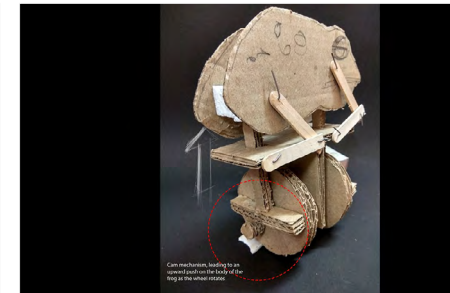
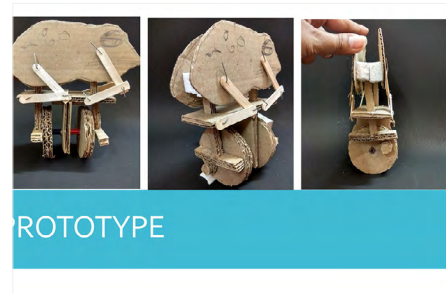
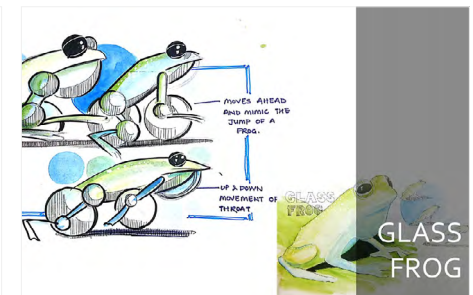
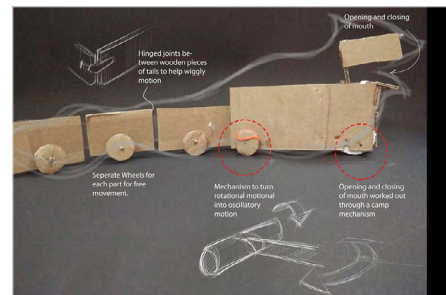
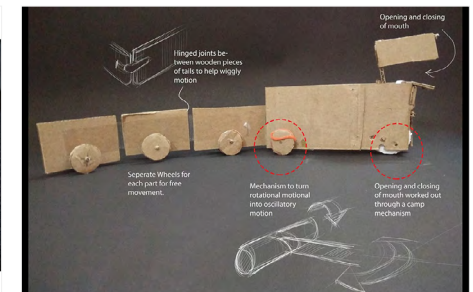
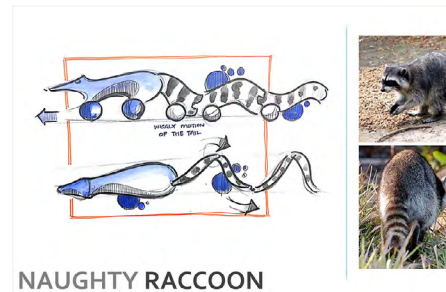
6B. Ride-on Toy - Group B

7. Toys

8. Links

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## Indian Toy Design

Biomimicry-inspired toys

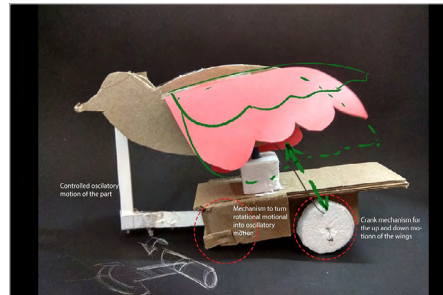
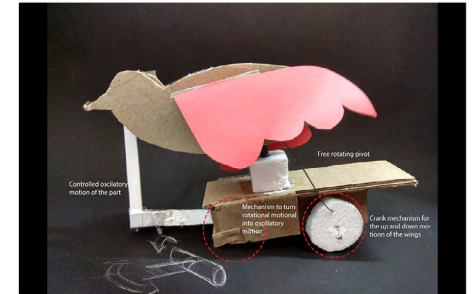
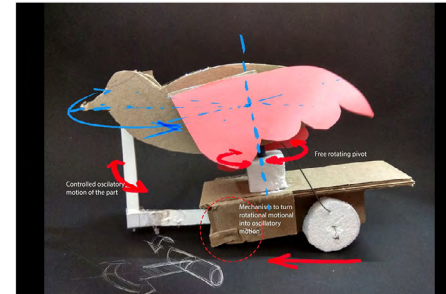
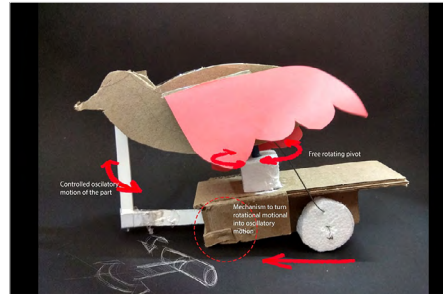
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Source:

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab

6Ac. Pakhi by Minal Agarwal

6Aci. Stage 1 Presentation

6Acii. Case Study - Slide Show

6Aciii. Poster

6Aciv. Video

6Ad, 6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj,

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

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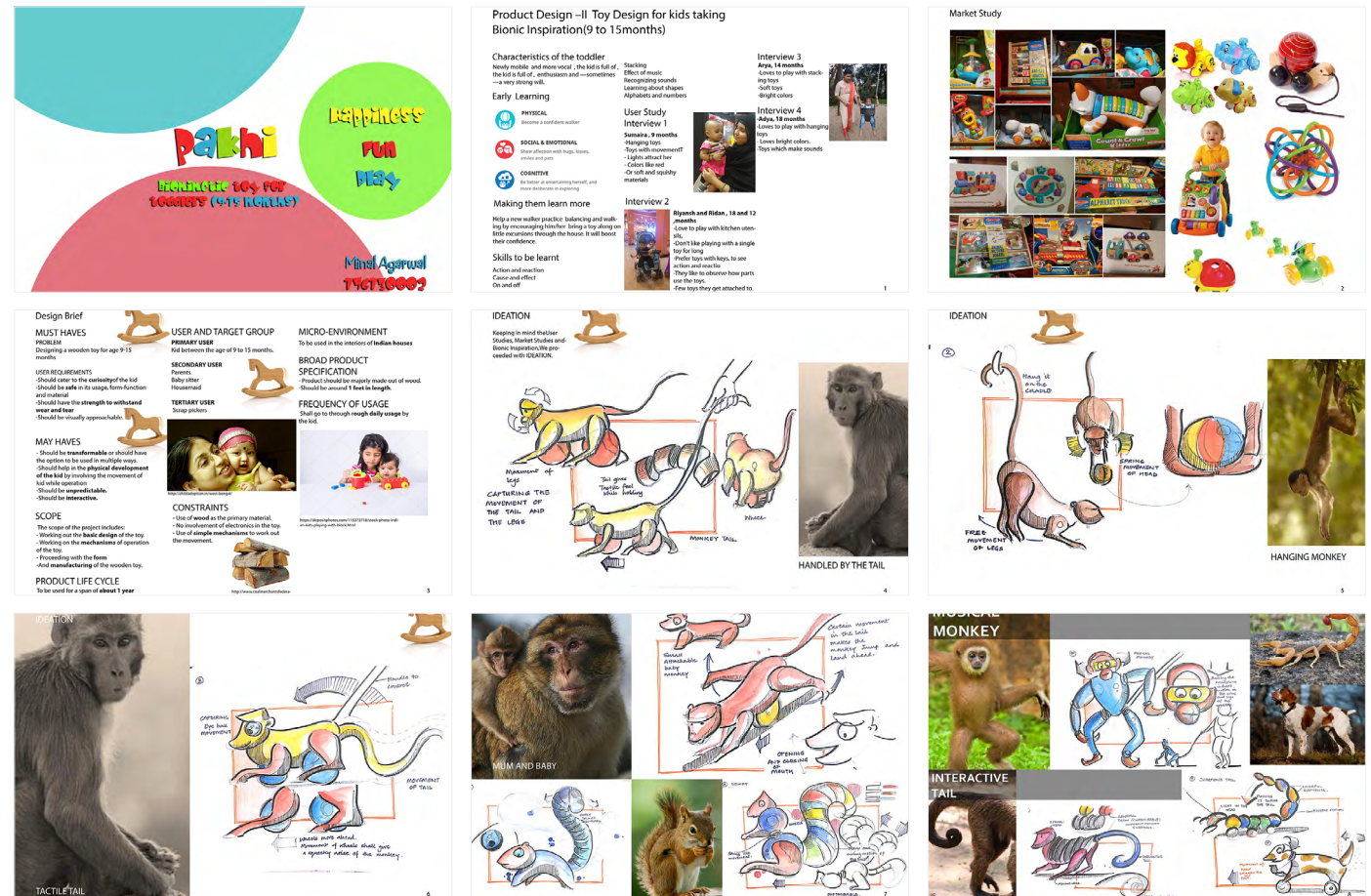
Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/pakhi-minal-agarwal/case-study-slide>

## Case Study - Slide Show

Case Study Download:

- Pakhi\_by Minal Agarwal.....
- Pakhi\_by Minal Agarwal\_Report.....



1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab

6Ac. Pakhi by Minal Agarwal

6Aci. Stage 1 Presentation

6Aci. Case Study - Slide Show

6Aciii. Poster

6Aciv. Video

6Ad, 6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj,

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

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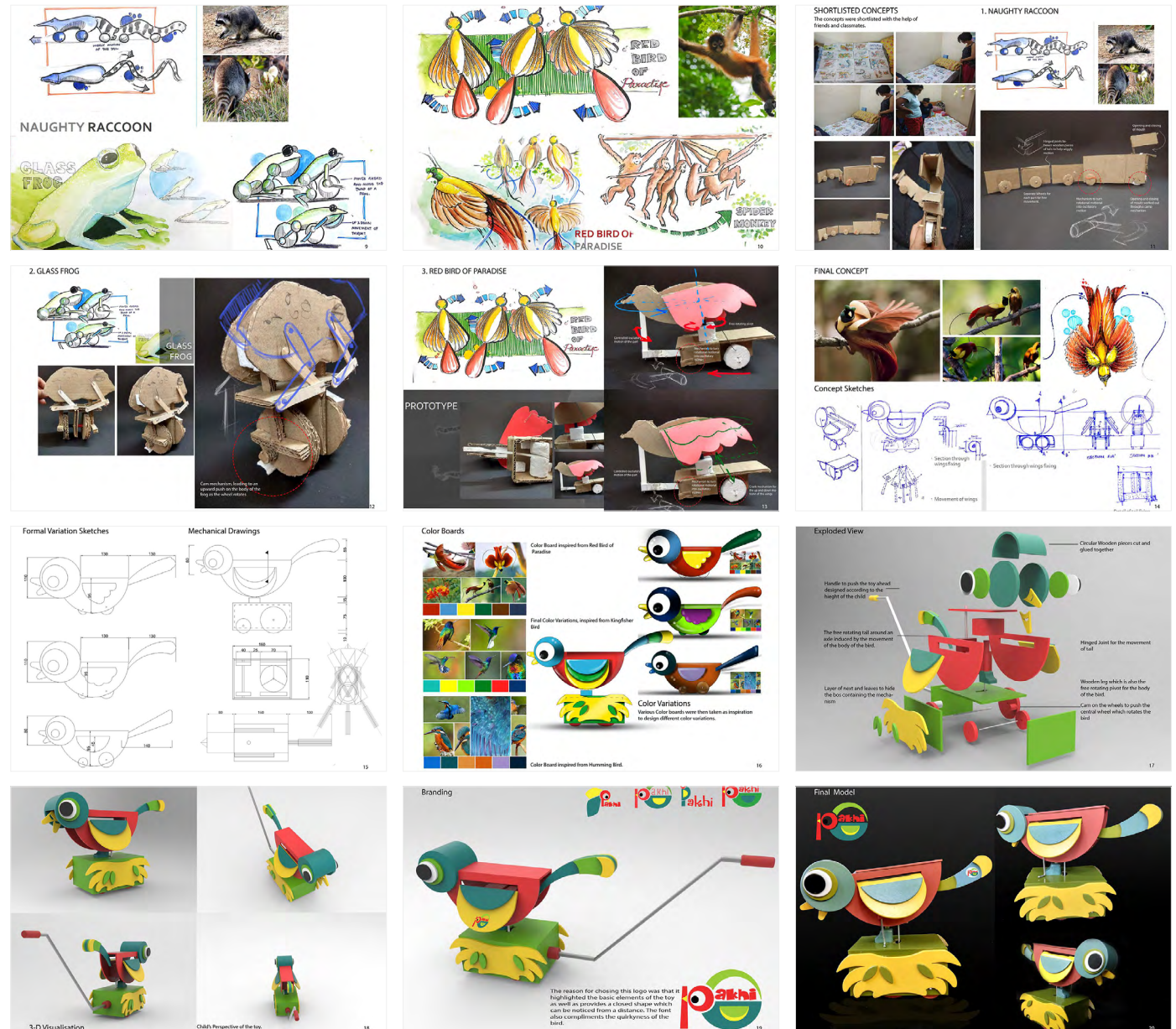
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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab

6Ac. Pakhi by Minal Agarwal

6Aci. Stage 1 Presentation

6Aci. Case Study - Slide Show

6Aciii. Poster

6Aciv. Video

6Ad, 6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj,

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6B. Ride-on Toy - Group B

7. Toys

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

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6Aci. Stage 1 Presentation

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6Aciii. Poster

6Aciv. Video

6Ad, 6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj,

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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### Poster



1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab

6Ac. Pakhi by Minal Agarwal

6Aci. Stage 1 Presentation

6Acii. Case Study - Slide Show

6Aciii. Poster

6Aciv. Video

6Ad, 6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj,

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

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Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/pakhi-minal-agarwal/video>

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab

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6Acii. Case Study - Slide Show

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6Ad, 6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj,

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

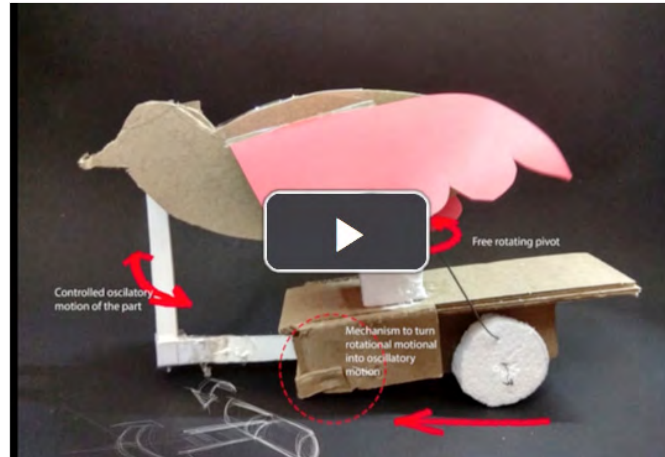
8. Links

9. Video

10. Contact Details

## Video

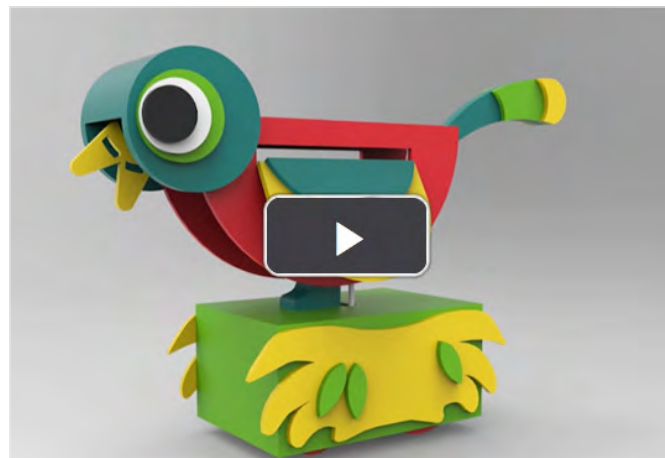
Presentation Stage 1 by Minal Agarwal

YouTube Video Link.....

Toy Design Mechanism by Minal Agarwal

YouTube Video Link.....

Pakhi by Minal Agarwal

YouTube Video Link.....



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Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/rollerpede-mridul-jain>

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac

6Ad. Rollerpede by Mridul Jain

6Adi. Stage 1 Presentation

6Adii. Case Study - Slide Show

6Adiii. Video

6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

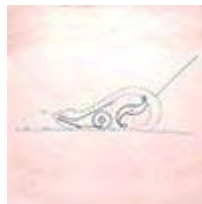
9. Video

10. Contact Details

## Rollerpede by Mridul Jain

The exercise was given as a part of the Product Design Module in the second semester of Jr. M. Des. Industrial design course at IDC, IIT Bombay, conducted by Prof. Vijay Bapat. The class of 14 was divided into groups of 7 each with the first group given a task to design a push toy for 9-15 months old and another group was given a task to design a ride-on toy for 6-12 years old. The first group was given a limitation of using only wood or processed wood as a material. The duration of the module was three weeks.

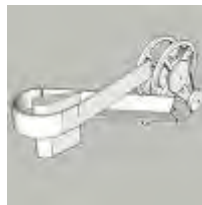
Biomimicry was given as a concept for design. Everyone has to take inspiration or derive their ideas from nature. Prof. Bapat gave us books regarding nature and nature-inspired designs from his collection to give us a start. The initial days we spent looking for ideas and inspiration, conducting market visits and simultaneously forming our own brief of the toy we would propose to design.



Stage 1 Presentation



Case Study - Slide Show



Video

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Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/rollerpede-mridul-jain/stage-1>

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac

6Ad. Rollerpede by Mridul Jain

6Adi. Stage 1 Presentation

6Adii. Case Study - Slide Show

6Adiii. Video

6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

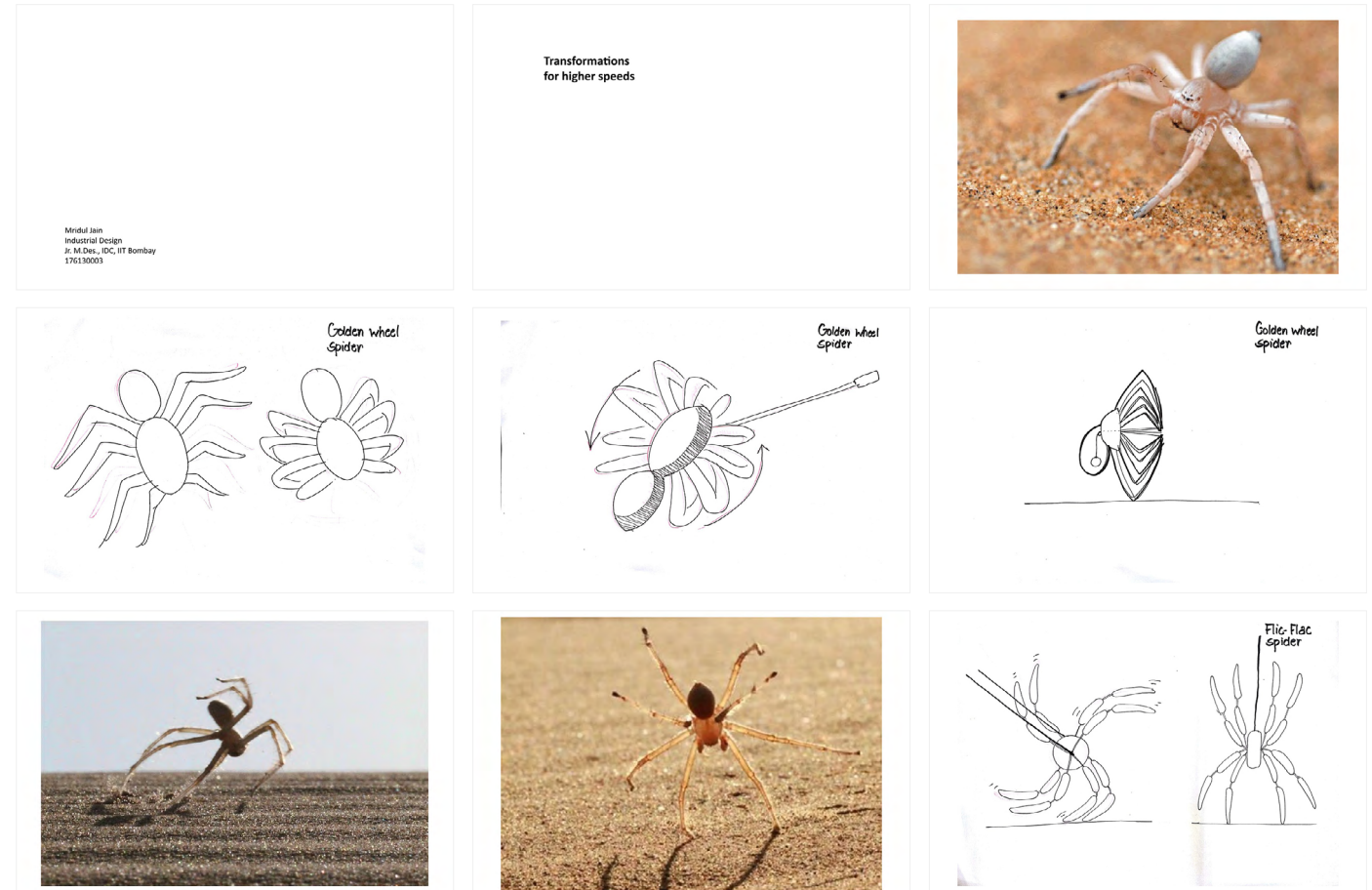
9. Video

10. Contact Details

## Stage 1 Presentation

Download:

- [Rollerpede\\_Stage 1 Presentation\\_by Mridul Jain.....](#)



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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac

6Ad. Rollerpede by Mridul Jain

6Adi. Stage 1 Presentation

6Adii. Case Study - Slide Show

6Adiii. Video

6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

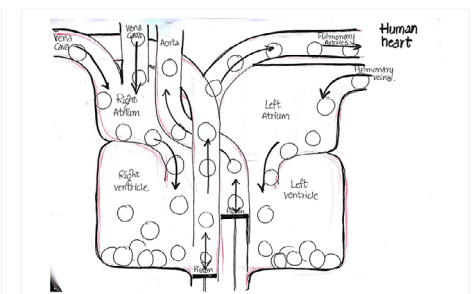
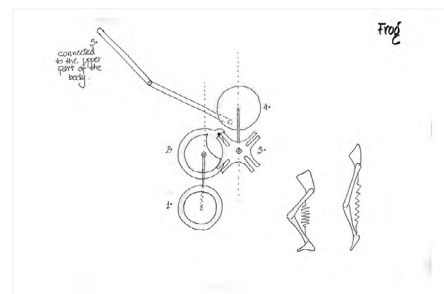
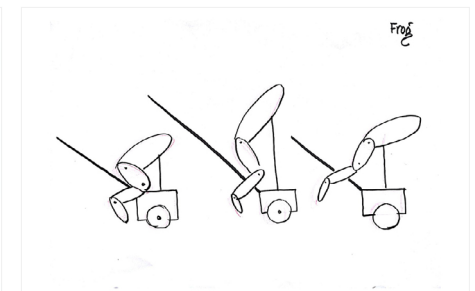
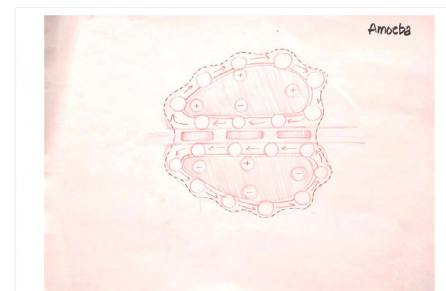
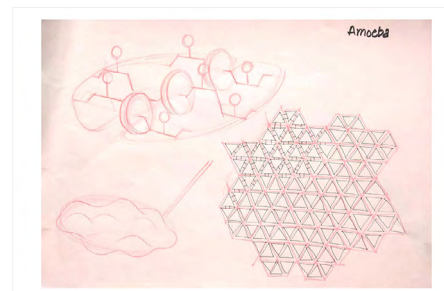
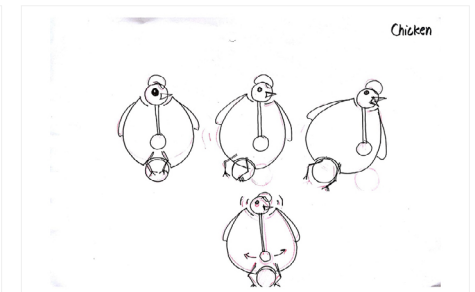
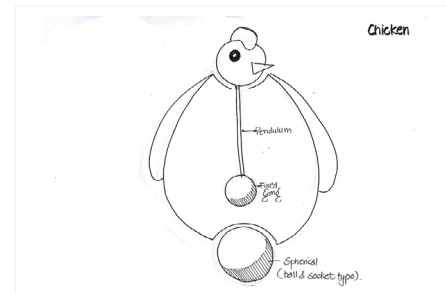
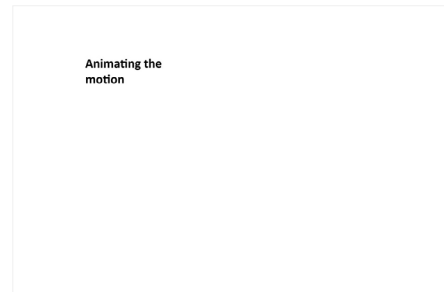
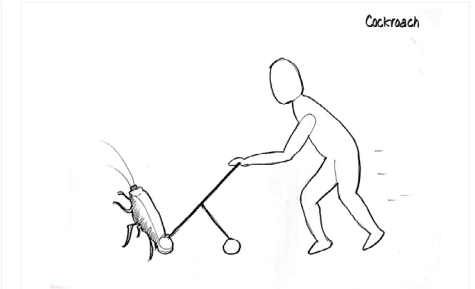
6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

10. Contact Details



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## Indian Toy Design

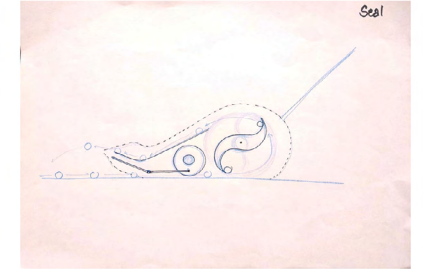
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Using the hunting  
characteristic as a  
play feature



Source:

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac

6Ad. Rollerpede by Mridul Jain

6Adi. Stage 1 Presentation

6Adii. Case Study - Slide Show

6Adiii. Video

6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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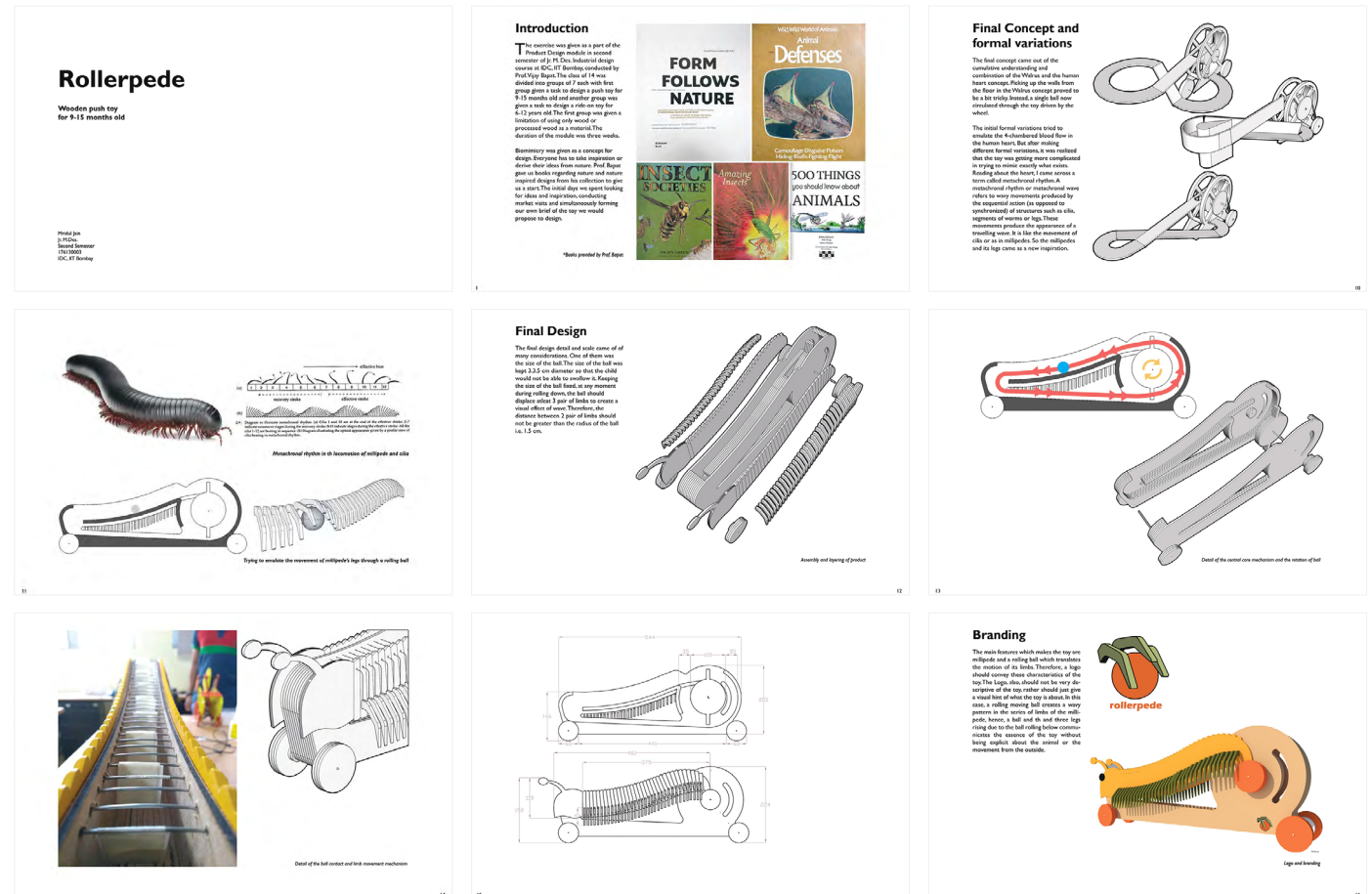
Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/rollerpede-mridul-jain/case-study>

## Case Study - Slide Show

Case Study Download:

- [Rollerpede\\_by Mridul Jain.....](#)
- [Rollerpede\\_by Mridul Jain\\_Report.....](#)



1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac

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6Adi. Stage 1 Presentation

6Adii. Case Study - Slide Show

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6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj

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6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

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6Adiii. Video

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6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

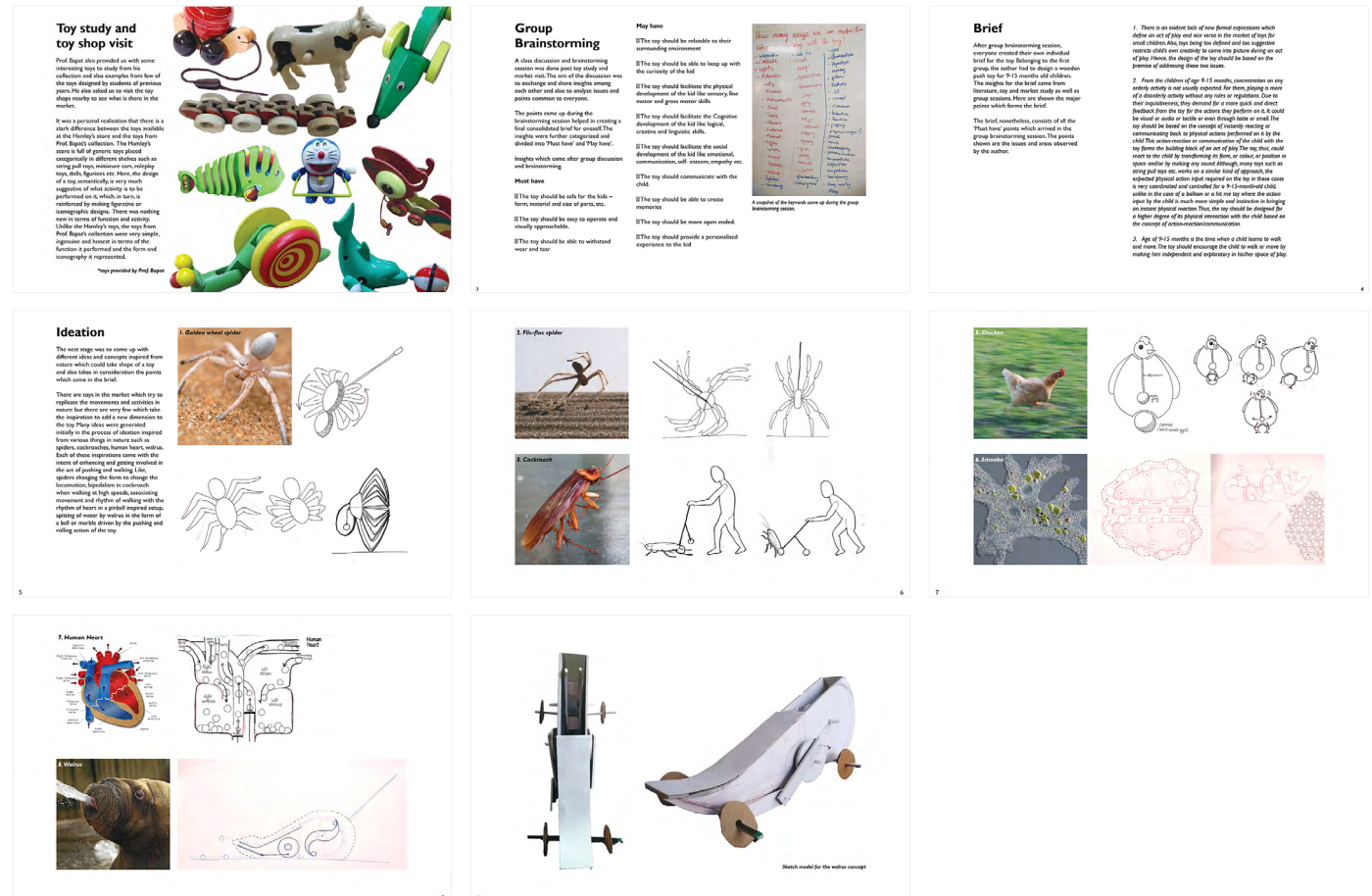
6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

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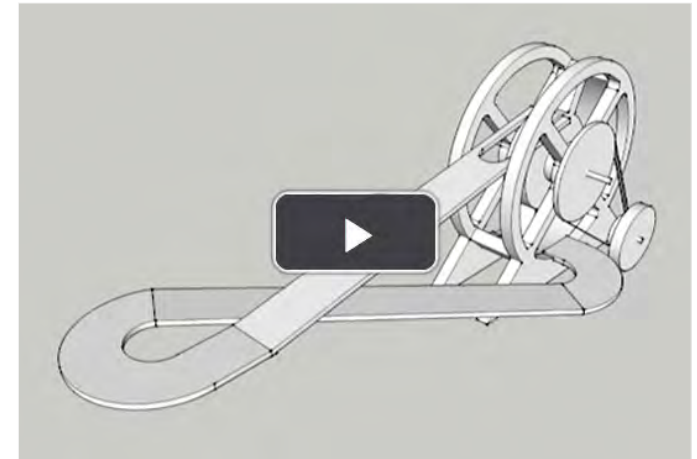
<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/rollerpede-mridul-jain/video>

## Video

### Presentation Stage 1 by Mridul Jain

YouTube Video Link.....

### Final Presentation by Mridul Jain

YouTube Video Link.....

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac

6Ad. Rollerpede by Mridul Jain

6Adi. Stage 1 Presentation

6Adii. Case Study - Slide Show

6Adiii. Video

6Ae, 6Af, 6Ag, 6Ah, 6Ai, 6Aj

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

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7. Toys

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Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/totter-nikita-fatarpekar>

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad

6Ae. Totter by Nikita Fatarpekar

6Aei. Stage 1 Presentation

6Aeii. Case Study - Slide Show

6Aeiii. Video

6Af, 6Ag, 6Ah, 6Ai, 6Aj, 6Ak

6Al, 6Am, 6An, 6Ao, 6Ap, 6Aq

6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

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## Totter by Nikita Fatarpekar

Designing a wooden toy for kids aged 9 to 17 months needs to be very safe, with materials and edges that won't easily get damaged. The toy should be easy for kids to use on their own.

To make it interesting, the toy should move in some way and have colors or shapes that catch kids' eyes. It can be inspired by nature, like animals or plants, to make it more fun and educational.

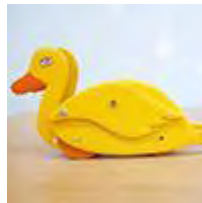
It should also help kids learn and grow physically by giving them feedback when they play with it. This way, playing with the toy helps kids develop and learn new skills.



Stage 1 Presentation



Case Study - Slide Show



Video



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# Indian Toy Design

Biomimicry-inspired toys

by

Prof. Vijay Bapat

IDC, IIT Bombay

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6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad

6Ae. Totter by Nikita Fatarpekar

6Aei. Stage 1 Presentation

6Aeii. Case Study - Slide Show

6Aeiii. Video

6Af, 6Ag, 6Ah, 6Ai, 6Aj, 6Ak

6Al, 6Am, 6An, 6Ao, 6Ap, 6Aq

6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

10. Contact Details

## Stage 1 Presentation

Download:

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### Objectives :

The object is to make innovative toy for the kids in house which has:

- 1) Which meets the demand of 9 to 17 months old age group.
- 2) It has to be in wooden and simple mechanism.
- 3) Learning experience and playful.

### Toy Study :



### Introduction:

The Problem given is For Kids To Play As They Grow From 9 to 17 months Old. The Problem Hence Identified Is To Design A Toy That Helps The Kids Development . A product in which the kid himself is engaged to Play and use one of the cognitive ability.

### Statement :

The design problem is to design a Toy for kids to play in the house.

### Brief :

The problem is design a wooden toy for a age group of 9 - 17 months old kid which is safe in terms of its material and edge which withstands wear and tear. Kids should operate and approach by themselves. It can create curiosity with movement and visually evokes experience by adopting biomimicking, adopting and learning physical development with constant feedback.

### User Study :

1. Kids approach the toy by seeing other kids playing over it.
2. Usability is as per whether they know to play with the toy or that it seems familiar to them.
3. The first stage is to understand how the toy works. There is curiosity in mind.

### Description

- AmaKart presents Friction powered Duck toy for kids.
- Watch the duck as it goes for a fun walk, and watch its funny moves. Kids can't resist running playing these funny animal.
- Colorful easy rolling wheels encourage crawl and chase fun, strengthening gross motor skills, balance coordination.
- Helps baby discover cause and effect

### Features

- Type: Push & Pull Along Toys
- Material: Plastic
- Non-battery Operated
- Non-rechargeable Batteries
- Minimum Age: 1 years
- Price - Rs. 184/-

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6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

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### Product Dimensions

- Product Width - 8 cm
- Product Height - 10.5 cm
- Product Depth - 7 cm
- Product Weight - 0.2 g

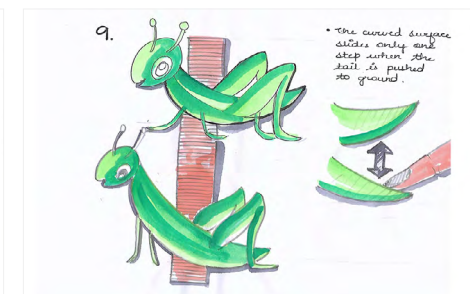
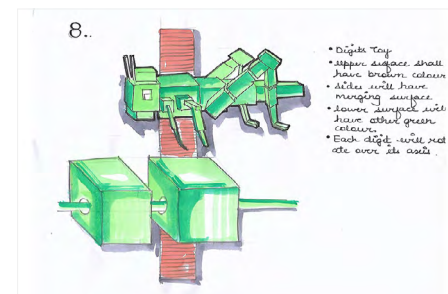
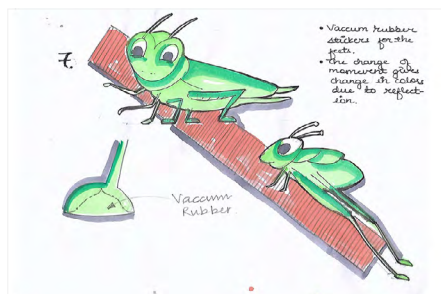
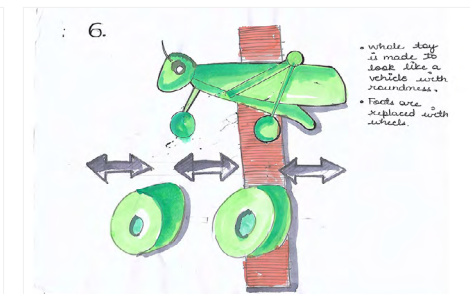
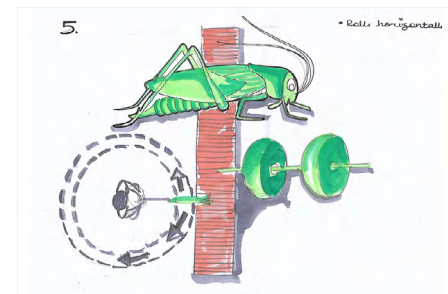
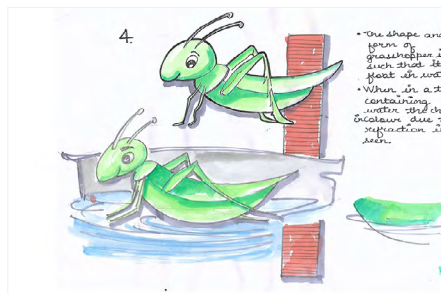
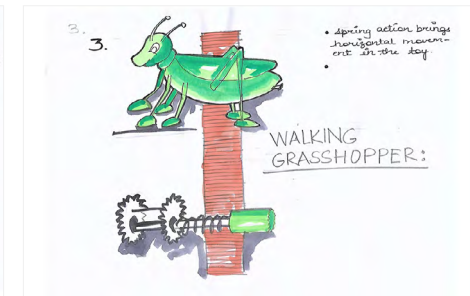
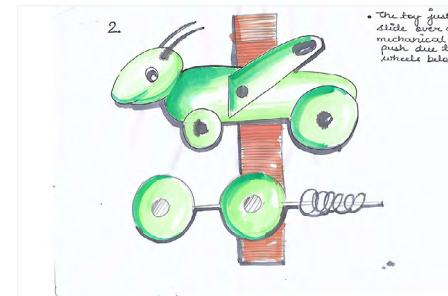
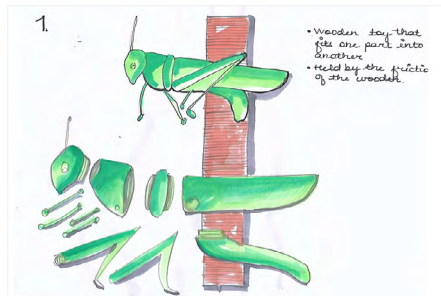
### Insights

- The toy is initially made in bright yellow colour that attracts the kids it is targeted to.
- The mechanism is simple and can be done by any age group.
- It involves the movement in terms of lateral-displacement from one position to other and vertical is g of the neck, whereas the beak and has both the movement.
- The principle is basic spring system and is easy to operate.
- It creates fun and delight among the target age group of kids.

### Idea Generation :

A toy should be social among both the kid and the parent.

The toy should be wholly understood.



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Biomimicry-inspired toys

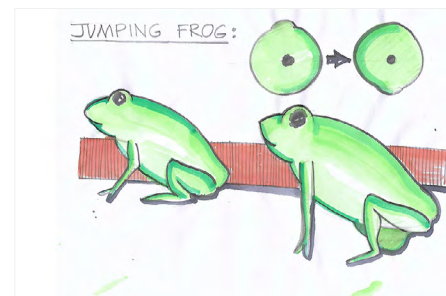
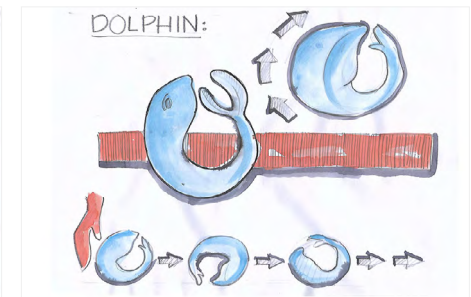
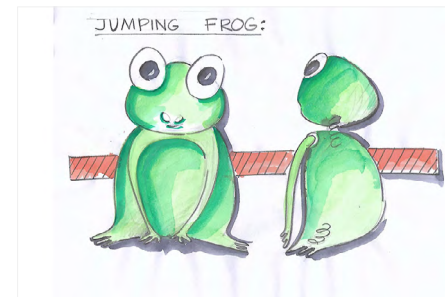
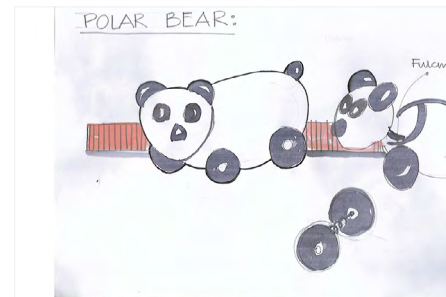
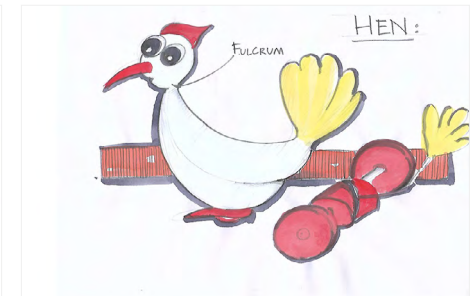
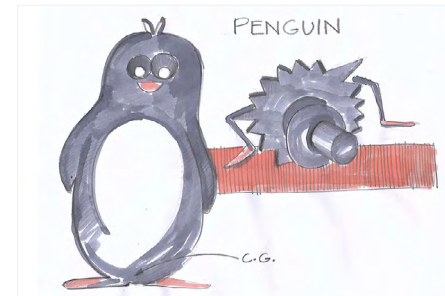
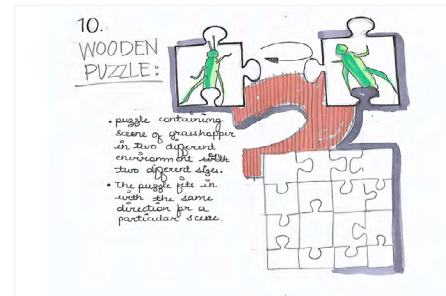
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## References :

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1, 2, 3, 4, 5, 6

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6Aei. Stage 1 Presentation

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6Aeiii. Video

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6B. Ride-on Toy - Group B

7. Toys

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6B. Ride-on Toy - Group B

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## Case Study - Slide Show

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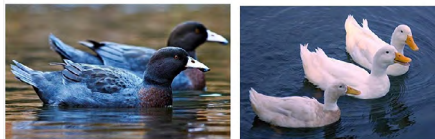
• **Totter\_by Nikita Fatarpekar.....**

### Objectives :

The object is to make innovative toy for the kids in house which has:

- 1) Which meets the demand of 9 to 17 months old age group.
- 2) it has to be in wooden and simple mechanism.
- 3) learning experience and playful.

### Inspiration



Its movement of quacking and wobbling

### Introduction:

The Problem given is For Kids To Play As They Grow From 9 to 17 months Old. The Problem Hence Identified Is To Design A Toy That Helps The Kids Development . A product in which the kid himself is engaged to Play and us one of the cognitive ability.

### Statement :

The design problem is to design a Toy for kids to play in the house.

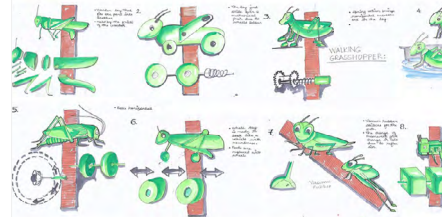
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The problem is design a wooden toy for a age group of 9 - 17 months old kid which is safe in terms of it material and edge which withstands wear and tear. Kids should operate and approach by themselves. It can create curiosity with movement and visually evokes experience by adopting biomimicking, adopting and learning physical development with constant feedback.

### User Study :

1. Kids approach the toy by seeing other kids playing over it.
2. Usability is as per whether they know to play with the toy or that it see familiar to them.
3. The first stage is to understand how the toy works. There is curiosity i mind.

### Ideas



### Mechanism

Axial crank  
Crank

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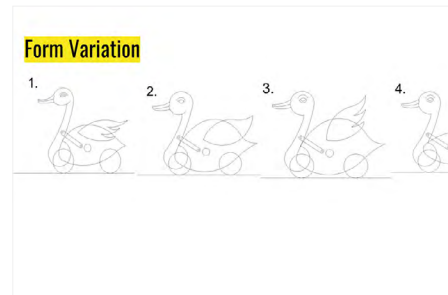
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## Video

Presentation Stage 1 by Nikita Fatarpekar



YouTube Video Link.....

Toy Design Mechanism by Nikita Fatarpekar



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6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae

6Af. Waliz by Nirmal P J

6Afi. Stage 1 Presentation

6Afi. Case Study - Slide Show

6Afi. Poster

6Afi. Video

6Ag, 6Ah, 6Ai, 6Aj, 6Ak, 6Al

6Am, 6An, 6Ao, 6Ap, 6Aq

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6B. Ride-on Toy - Group B

7. Toys

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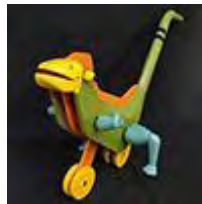
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## Waliz by Nirmal P J

This project was done as a part of our product design 2 module. The objective of this project was to design a wooden toy for kids between the ages of 9 months to 15 months. The primary material used for making the toy has to be wood but it can be of any form like timber, plywood, particle board, MDF, etc. Other natural materials can also be used for certain applications if required, but they should be of minimal amount and have no plastic parts. The design of the toy has to be inspired by nature and based on biomimicry.



Stage 1 Presentation



Poster



Case Study - Slide Show



Video

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6B. Ride-on Toy - Group B

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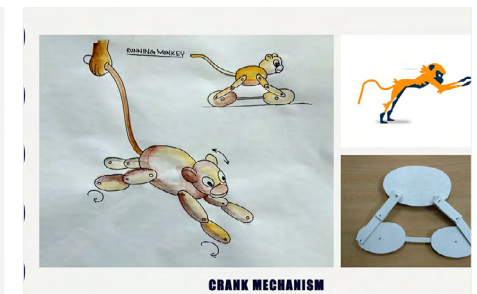
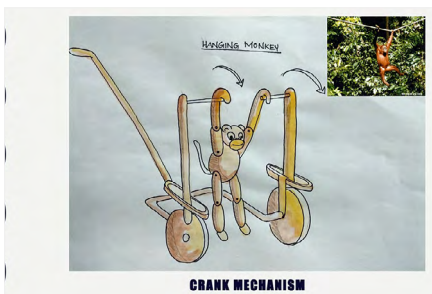
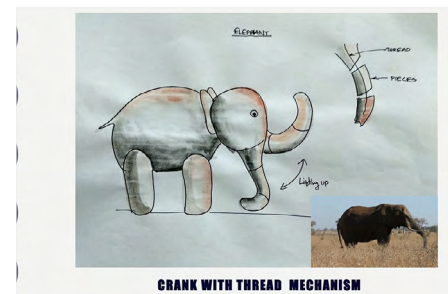
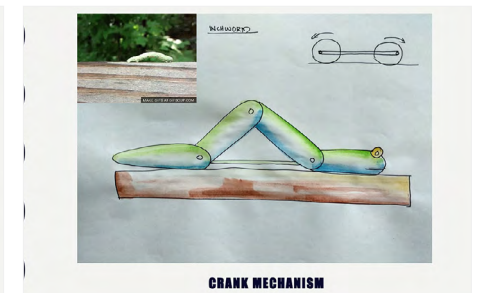
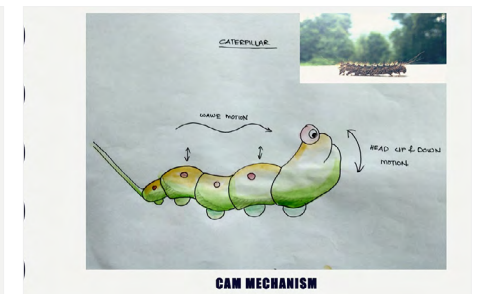
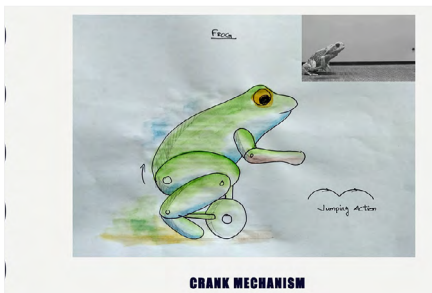
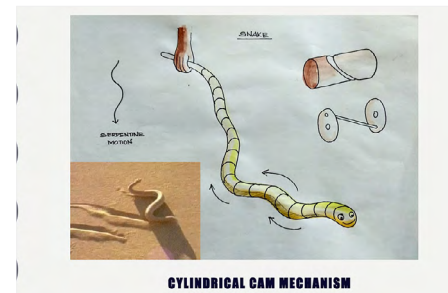
• [Waliz\\_Stage 1 Presentation\\_by Nirmal P J.....](#)

**DESIGN BRIEF****Problem statement**

Design a toy for kids aged between 9 months to 15 months using wood as the primary material and taking inspiration from nature.

**Design Objective**

To design a toy for kids aged between 9 months to 15 months which helps them in physical development through various activities. The toy ensures it is safe for the kid in all the aspects, it provides easy operation and it takes care of the wear and tear of the usage, using wood as the primary material and taking inspiration from nature.



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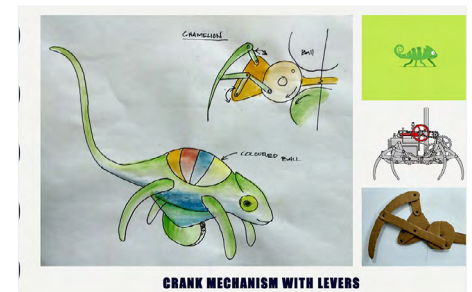
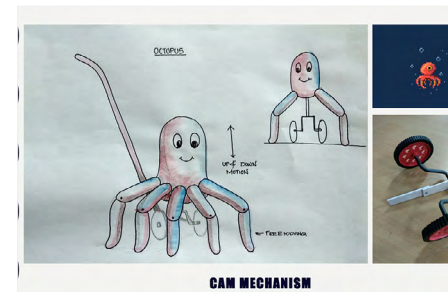
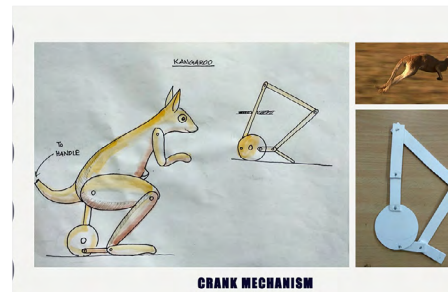
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- [https://cdn.dribbble.com/users/1320633/screenshots/2492217/octo\\_800x600.gif](https://cdn.dribbble.com/users/1320633/screenshots/2492217/octo_800x600.gif) (10/04/18)
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6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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## Case Study - Slide Show

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PRODUCT DESIGN 2  
PROJECT REPORT  
COURSE FACULTY: PROF. VIJAY BAPAT  
INDUSTRIAL DESIGN CENTRE, IIT BOMBAY

WOODEN TOYS FOR KIDS BETWEEN 9 TO 15 MONTHS OLD

NIRMAL P J  
170130009

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12. FINAL PRODUCT PHOTOS  
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INTRODUCTION

This project was done as a part of our product design 2 module. The objective of this project was to design a wooden toy for kids between the age of 9 months to 15 months. The primary material used for making the toy has to be wood but it can be of any form like timber, plywood, particle board, MDF, etc. Other natural materials can also be used for certain applications if required, but it should be of minimal amount and no plastic parts. The design of the toy has to be inspired from nature and based on biomimicry.

DESIGN INSIGHTS

Based on the observations made during the User study, Market research and Internet research the following insights were derived. The insights were classified into must haves and may haves.

**Must Have**

The toy should be safe for the kids – form, material and size of parts, etc.  
The toy should be easy to operate and visually approachable.  
The toy should be able to withstand wear and tear.

**May Have**

The toy should be reliable to their surrounding environment.  
The toy should be able to keep up with the curiosity of the kid.  
The toy should facilitate the physical development of the kid like sensory, fine motor and gross motor skills.  
The toy should facilitate the Cognitive development of the kid like logical, creative and linguistic skills.  
The toy should facilitate the social development of the kid like emotional, communication, self-esteem, empathy etc.  
The toy should be able to create memories.  
The toy should be more open ended.  
The toy should provide a personalized experience to the kid.

DESIGN OBJECTIVE

**Problem Statement**  
Design a toy for kids aged between 9 months to 15 months using wood as the primary material and taking inspiration from nature.

**Design Objective**  
To design a toy for kids aged between 9 months to 15 months which helps them in development their physical development. It has to ensure that the toy is safe for the kid in all the aspects, it has to provides easy operation and it should takes care of the wear and tear of the usage, by using wood as the primary material and taking inspiration from nature.

DESIGN BRIEF

**Problem:**  
Design a toy for kids aged between 9 months to 15 months using wood as the primary material and taking inspiration from nature.

**User requirements:**

- The toy needs to be safe for the kids – form, material and size of parts, etc.
- The toy needs to be easy to operate and visually approachable.
- The toy needs to be able to withstand wear and tear.

**Scope:**  
The product is only for the kids between the ages of 9 months to 15 months. The primary material of the product can be any type of wood with minimum use of other materials and the inspiration for the product can be anything from nature.

**User and target market segments:**  
Primary User – 9 to 15 months old child  
Secondary User – Parents, Relatives or Baby sitters  
Tertiary User – Sales agent  
Quaternary Users – Repair technician  
The product is targeted to all the income groups of the society.

DESIGN IDEAS

**1. Caterpillar**  
The idea was inspired from the movement of a caterpillar. The body of the caterpillar could be segmented and can have a cam mechanism for each segment to mimic the movement.

**2. Snake**  
The idea was inspired by the serpentine motion of the snake. The toy body of the snake could be segmented with a ratchet mechanism to mimic the movement.

**3. Inchworm**  
The idea was inspired by the movement of an inchworm. The mechanism can be made using a ratchet mechanism.

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae

6Af. Waliz by Nirmal P J

6Afi. Stage 1 Presentation

6Afi. Case Study - Slide Show

6Afi. Poster

6Afi. Video

6Ag, 6Ah, 6Ai, 6Aj, 6Ak, 6Al

6Am, 6An, 6Ao, 6Ap, 6Aq

6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

10. Contact Details



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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae

6Af. Waliz by Nirmal P J

6Afi. Stage 1 Presentation

6Afi. Case Study - Slide Show

6Afi. Poster

6Afi. Video

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6Am, 6An, 6Ao, 6Ap, 6Aq

6Ar, 6As, 6At, 6Au, 6Av

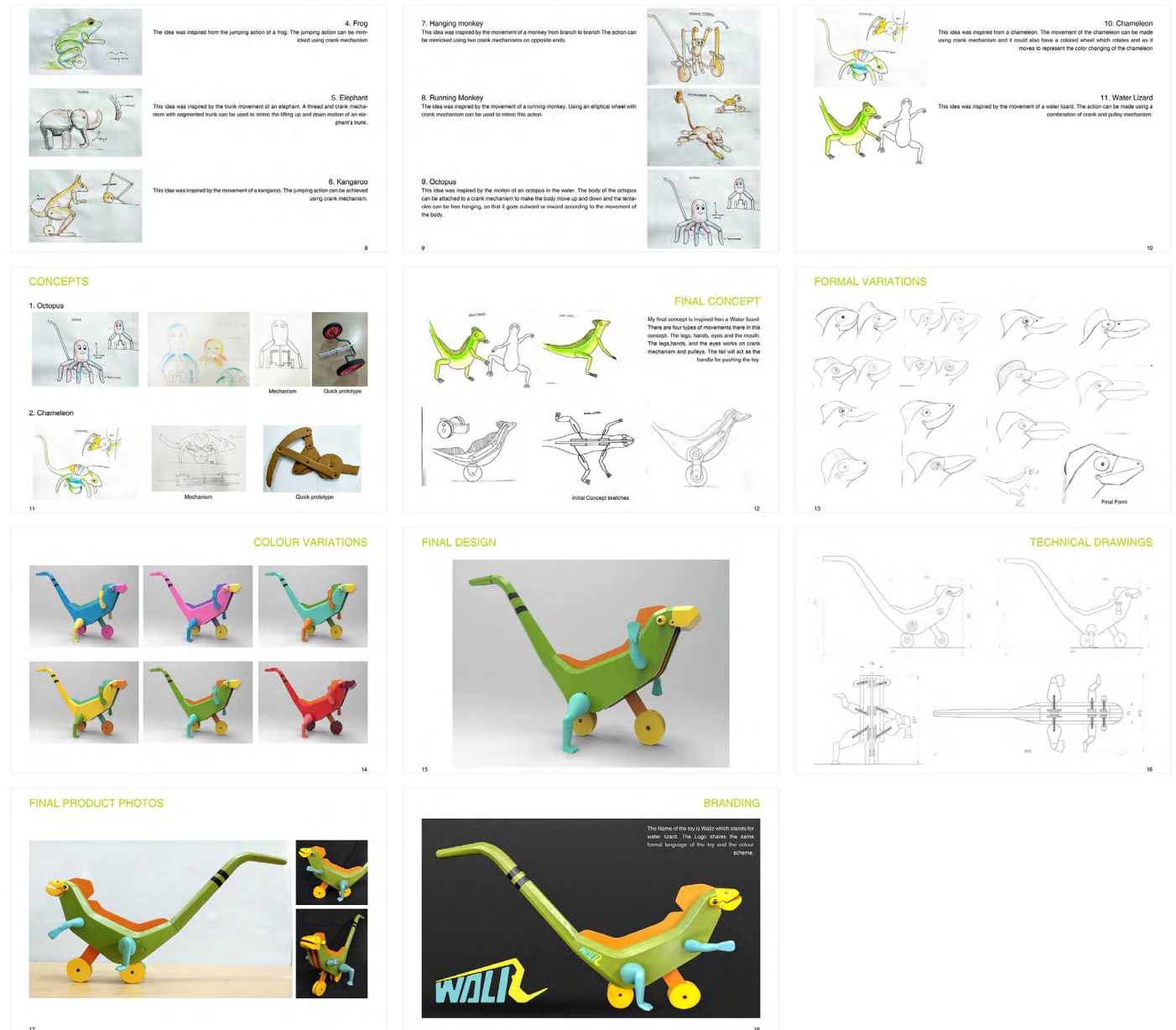
6B. Ride-on Toy - Group B

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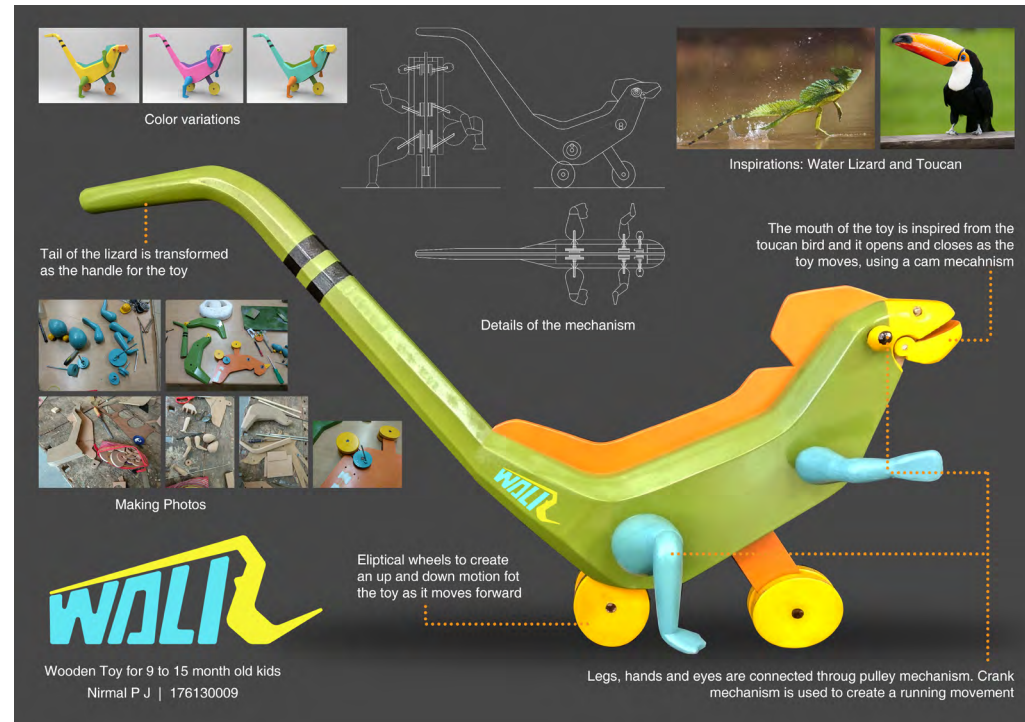
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## Poster



1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae

6Af. Waliz by Nirmal P J

6Afi. Stage 1 Presentation

6Afi. Case Study - Slide Show

6Afi. Poster

6Afi. Video

6Ag, 6Ah, 6Ai, 6Aj, 6Ak, 6Al

6Am, 6An, 6Ao, 6Ap, 6Aq

6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae

6Af. Waliz by Nirmal P J

6Afi. Stage 1 Presentation

6Afii. Case Study - Slide Show

6Afiii. Poster

6Afiiv. Video

6Ag, 6Ah, 6Ai, 6Aj, 6Ak, 6Al

6Am, 6An, 6Ao, 6Ap, 6Aq

6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

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## Video

Presentation Stage 1 by Nirmal P J



YouTube Video Link.....

Toy Design Mechanism by Nirmal P J



YouTube Video Link.....

Waliz by Nirmal P J



YouTube Video Link.....

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af

6Ag. Toto by Rajat

6Agi. Stage 1 Presentation

6Agii. Case Study - Slide Show

6Agiii. Poster

6Agiv. Video

6Ah, 6Ai, 6Aj, 6Ak, 6Al, 6Am

6An, 6Ao, 6Ap, 6Aq, 6Ar, 6As

6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

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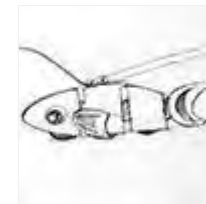
## Toto by Rajat

Often growing toddlers tend to be very curiously agile when they start observing, understanding and communicating the world around them. By the time they grow older, they gain enough experience to notice and react to any kind of sensory input. They may learn to make decisions based on the things thrown at them as entertainment like electronic gadgets. So this becomes an important concern when the child tries to get things with similar visual form or appeal.

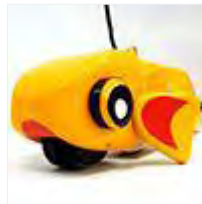
So as a part of Toy Design domain, the challenge is to design a wooden toy suitable for a child (9-15 months old). The toy should be designed by biomimetic as a learning from nature which also highly corresponds to the adaptation of living creatures in nature. For this toy, aquatic animals like Octopuses, Dolphins, Jellyfish and hens are looked upon as inspiration for their wavy, flaring, quirky and jerky motions and dynamic yet soft forms.



Stage 1 Presentation



Case Study - Slide Show



Poster



Video



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6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af

6Ag. Toto by Rajat

6Agi. Stage 1 Presentation

6Agii. Case Study - Slide Show

6Agiii. Poster

6Agiv. Video

6Ah, 6Ai, 6Aj, 6Ak, 6Al, 6Am

6An, 6Ao, 6Ap, 6Aq, 6Ar, 6As

6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

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## Stage 1 Presentation

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6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af

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6Agi. Stage 1 Presentation

6Agii. Case Study - Slide Show

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6An, 6Ao, 6Ap, 6Aq, 6Ar, 6As

6At, 6Au, 6Av

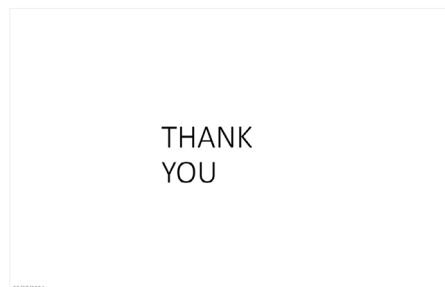
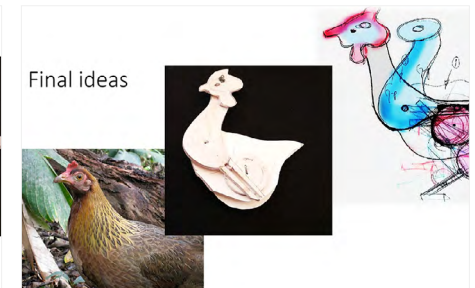
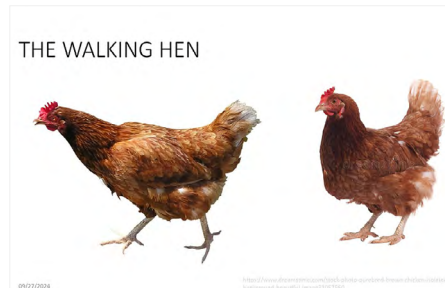
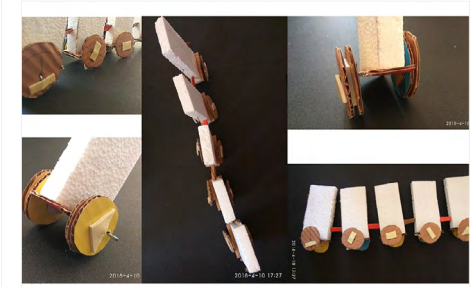
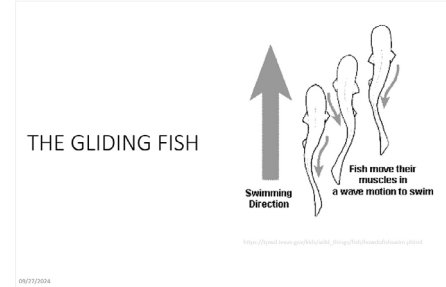
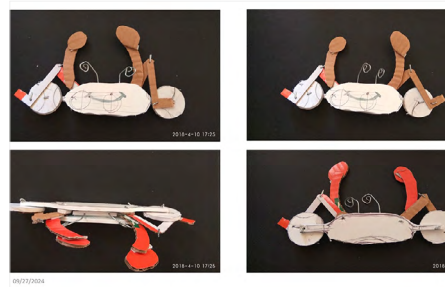
6B. Ride-on Toy - Group B

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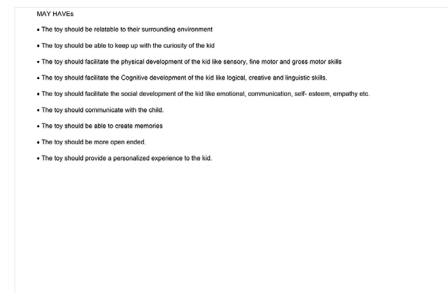
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## Case Study - Slide Show

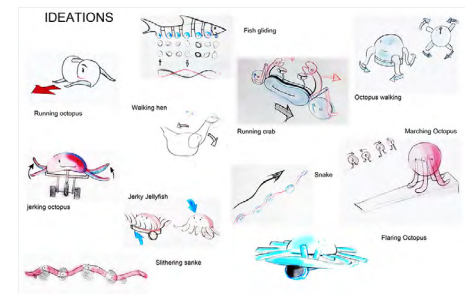
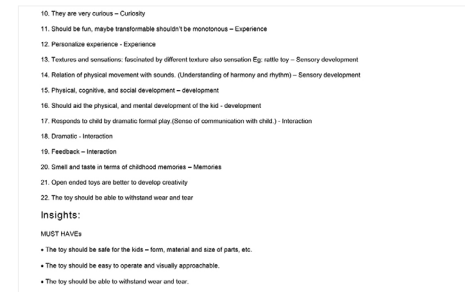
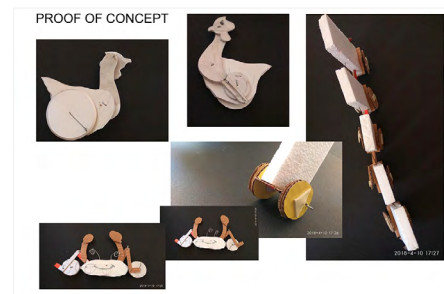
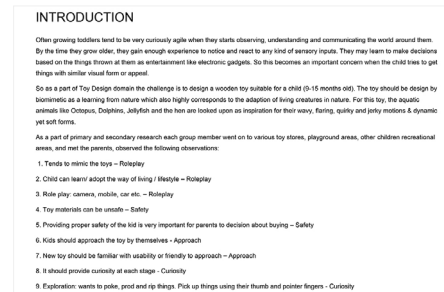
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CONCEPT EVALUATION

The Pugh's method is used for concept evaluation

CRITERIA	CONCEPTS									
	1 CLIMBING DOGS	2 BLUNDERB SPRINGS	3 FLAPPING OCTOPUS	4 FLAPPING OCTOPUS	5 JERKY JELLYFISH	6 GRAVITATING HEN	7 DOLPHIN	8 FLAPPING OCTOPUS	9 FLAPPING OCTOPUS WITH FLUTTERING SHRILL	10 GLIDING FISH
SAFETY IN TERMS OF SIZE	-	+	-	-	-	-	0	-	-	0
SAFETY	-	+	+	+	+	0	+	-	0	0
INTEREST OF FORMS	-	0	0	0	0	0	+	-	0	0
ROBUSTNESS	-	-	+	+	+	0	-	-	+	0
EASE OF OPERATION	-	0	-	-	-	0	0	-	0	0
WOW FACTOR	-	0	-	-	0	0	0	0	0	0
COGNITIVE SKILL DEVELOPMENT	-	0	+	+	0	+	0	0	0	0
LOGICAL SKILL DEVELOPMENT	-	0	-	-	-	0	-	0	0	0
LINGUISTIC SKILLS	-	0	-	-	-	0	-	0	0	0
4S	1	1	2	2	2	0	1	0	1	1
-S	7	3	5	5	3	9	2	9	2	2
NS	0	4	1	1	3	3	5	4	5	5
NET	-6	-2	-3	-3	-1	-6	-1	-2	-1	-1
RANK	8	4	6	5	3	9	2	7	1	1
CONCLUDE?						YES			YES	



## RATING THE CONCEPTS

CRITERIA	WEIGHTAGE	RATING					
		7 HEN	8 RUNNING CRAB WITH FLUTTERING SHELL	9 GLIDING FISH	10		
SAFETY IN TERMS OF SIZE	0.15	4	0.6	3	0.45	4	0.6
SAFETY INTERMS OF FORMS	0.15	3.5	0.825	3	0.45	4	0.6
ROBUSTNESS	0.15	4	0.6	3.5	0.525	4	0.6
EASE OF OPERATION	0.15	4.5	0.675	4	0.6	3	0.45
WOW FACTOR	0.1	3.5	0.35	4	0.4	5	0.5
COGNITIVE SKILL DEVELOPMENT	0.1	3	0.3	3.5	0.35	4	0.4
LOGICAL SKILL DEVELOPMENT	0.1	2	0.2	3	0.3	4.5	0.45
LINGUISTIC SKILLS	0.1	2	0.2	3	0.3	4.5	0.45
TOTAL			3.45		3.375		4.05

The concept with highest rating is selected after the iteration performed in previous table. Here the concept of fish is rated highest and hence taken further.

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af

6Ag. Toto by Rajat

6Agi. Stage 1 Presentation

6Agii. Case Study - Slide Show

6Agiii. Poster

6Agiv. Video

6Ah, 6Ai, 6Aj, 6Ak, 6Al, 6Am

6An, 6Ao, 6Ap, 6Aq, 6Ar, 6As

6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

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6At, 6Au, 6Av

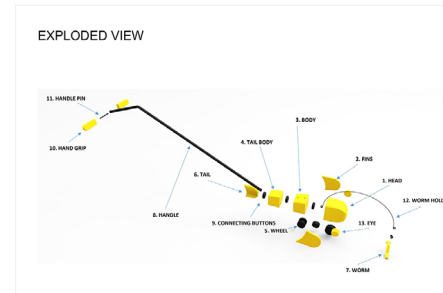
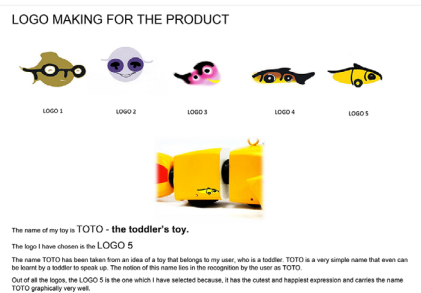
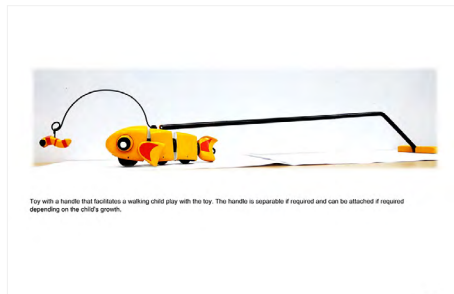
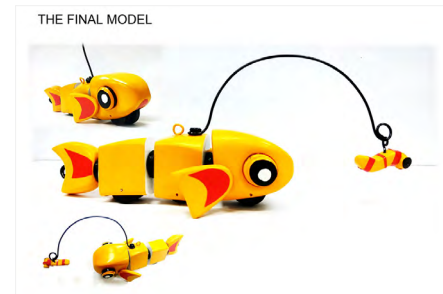
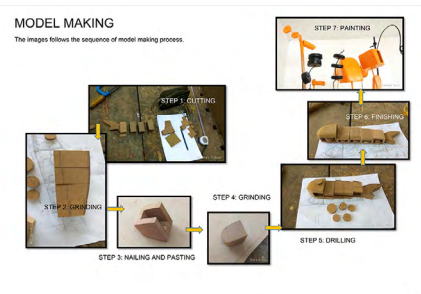
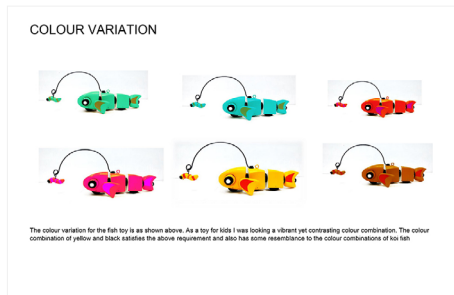
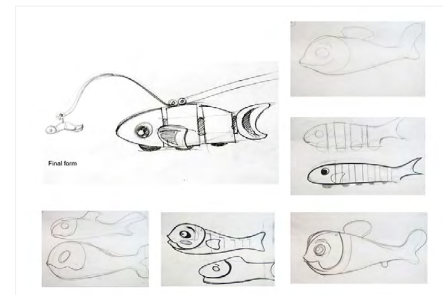
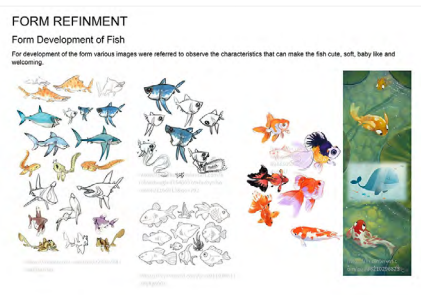
6B. Ride-on Toy - Group B

7. Toys

8. Links

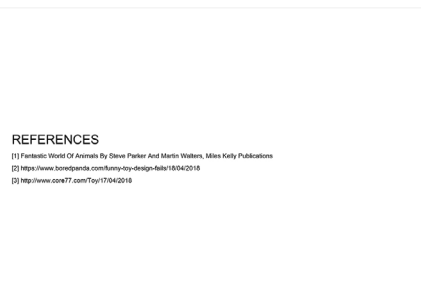
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**BILL OF MATERIALS**

SER NO.	NAME OF THE PART	MATERIAL	NO. OF UNITS
1	HEAD	WOOD (MDF)	1
2	FINS	WOOD (MDF)	2
3	BODY	WOOD (MDF)	1
4	TAIL BODY	WOOD (MDF)	1
5	WHEELS	WOOD (MDF)	2
6	TAIL	WOOD (MDF)	1
7	WORM	WOOD (MDF)	1
8	HANDLE	WOOD (MDF)	1
9	CONNECTING BUTTON	WOOD (MDF)	2
10	HANDLE GRIP	WOOD (MDF)	1
11	HANDLE PIN	SS WIRE	1
12	WORM HOLDER	SS WIRE	1
13	EYE	WOOD (MDF)	2





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## Poster



1, 2, 3, 4, 5, 6

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6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af

6Ag. Toto by Rajat

6Agi. Stage 1 Presentation

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6Ah, 6Ai, 6Aj, 6Ak, 6Al, 6Am

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6At, 6Au, 6Av

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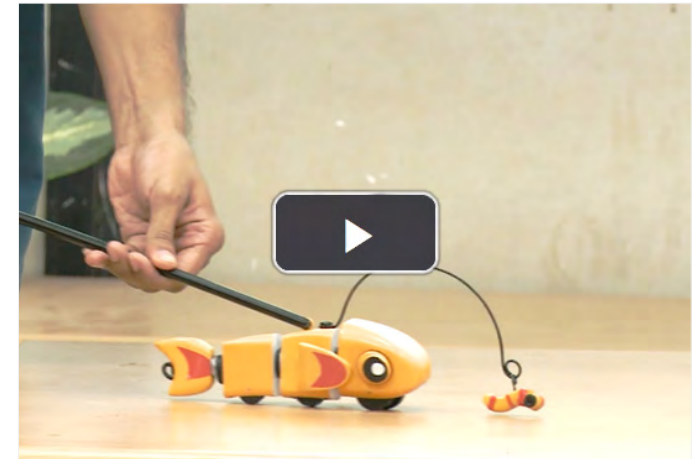
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## Video

Presentation Stage 1 by Rajat

YouTube Video Link.....

Final Presentation by Rajat

YouTube Video Link.....

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af

6Ag. Toto by Rajat

6Agi. Stage 1 Presentation

6Agii. Case Study - Slide Show

6Agiii. Poster

6Agiv. Video

6Ah, 6Ai, 6Aj, 6Ak, 6Al, 6Am

6An, 6Ao, 6Ap, 6Aq, 6Ar, 6As

6At, 6Au, 6Av

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah. Chani by Aamod Narkar

6Ahi. Case Study - Slide Show

6Ahii. Poster

6Ahiii. Video

6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao

6Ap, 6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

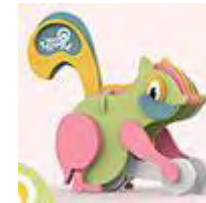
10. Contact Details

## Chani by Aamod Narkar

The aim of the project is to design a wooden toy for children aged 9-24 months inspired by a selected animal, biomimicking its actions in order to provide the child with a playful experience of the animal. The toy will be made from plywood, MDF, or wood, ensuring safety and durability. It should be operated by pulling or pushing and designed with colors and shapes that are friendly for young users. The toy is intended for indoor use, fostering imaginative play and physical interaction within that environment.



Case Study - Slide Show



Poster



Video

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## Case Study - Slide Show

Case Study Download:

- Chani\_by Aamod Narkar.....
- Chani\_by Aamod Narkar\_Report.....

**Product Design 02**

**Wooden Toy Design Report**

Aamod Narkar | 20190053  
Submitted by Prof. Vijay Bapat

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• Design Insights	3 - 5
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• Mechanism Ideations	7
• Squirrel Selection	8
• Dirty Prototyping	9 - 11
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• Formal Variations	14-15
• Colour Variations	16
• Final Design	17
• Technical Drawing	18
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**Design Insights**

**Design Brief**  
To design a wooden toy for children aged 8-10 months inspired from a selected animal, biomimicry 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/mittewood.
- 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/her 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 Maintenance**

- It should be easy to clean.
- It should be easy to operate.

**Mechanism Ideations**

01: Flamingo

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

02: Crocodile

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

03: Indian Squirrel

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

**Squirrel Selection**

Indian squirrel was selected as it found interesting scope in biomimicry its actions as running with a bounding effect and the flapping of its tail, also 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: Flamingo

1. Cut these boards and glue them together as shown in the image. 2. Attach the long stick to the body of the bird. 3. Attach the long stick to the body of the bird. 4. Attach the long stick to the body of the bird.

02: Crocodile

1. Cut these boards and glue them together as shown in the image. 2. Attach the long stick to the body of the crocodile. 3. Attach the long stick to the body of the crocodile. 4. Attach the long stick to the body of the crocodile.

03: Indian Squirrel

1. Cut these boards and glue them together as shown in the image. 2. Attach the long stick to the body of the squirrel. 3. Attach the long stick to the body of the squirrel. 4. Attach the long stick to the body of the squirrel.

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah. Chani by Aamod Narkar

6Ahi. Case Study - Slide Show

6Ahi. Poster

6Ahi. Video

6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao

6Ap, 6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

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## Indian Toy Design

Biomimicry-inspired toys

by

Prof. Vijay Bapat

IDC, IIT Bombay

Source:

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah. Chani by Aamod Narkar

6Ahi. Case Study - Slide Show

6Ahii. Poster

6Ahihi. Video

6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao

6Ap, 6Aq, 6Ar, 6As, 6At, 6Au, 6Av

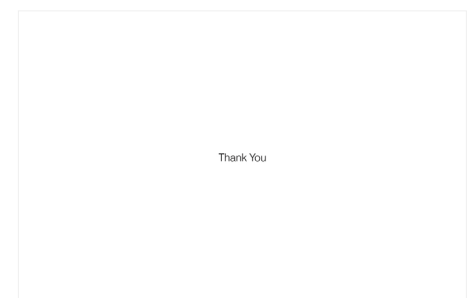
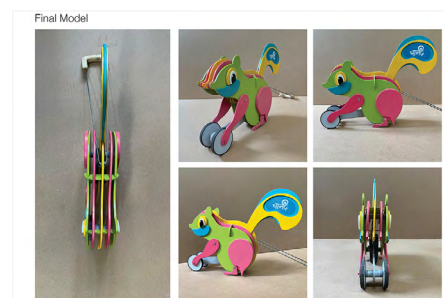
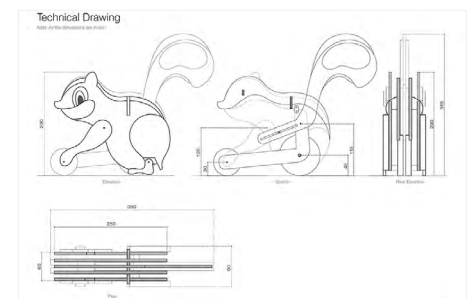
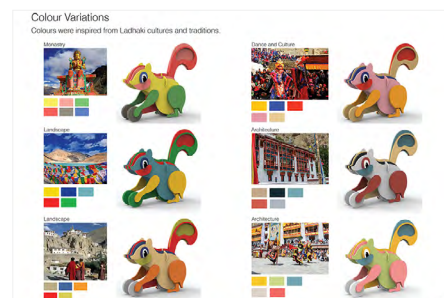
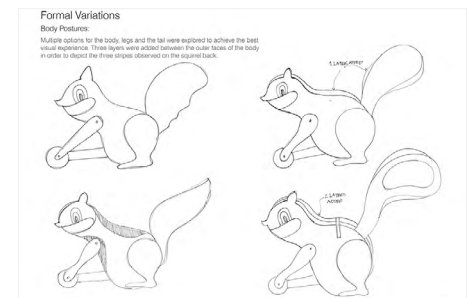
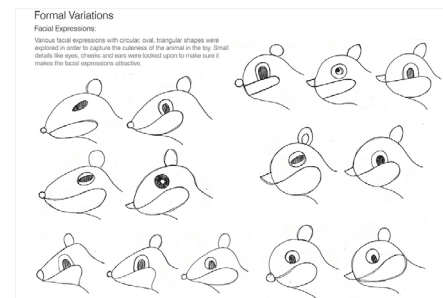
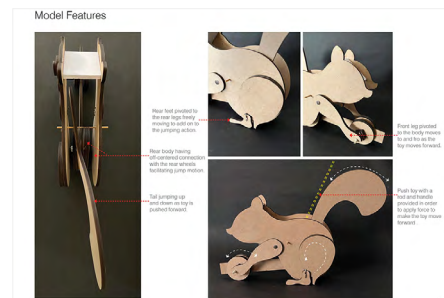
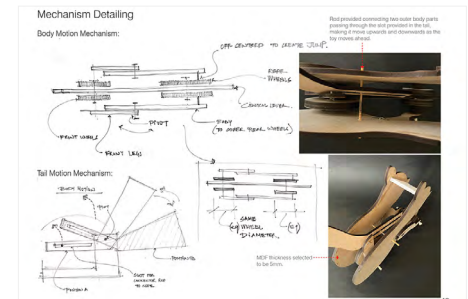
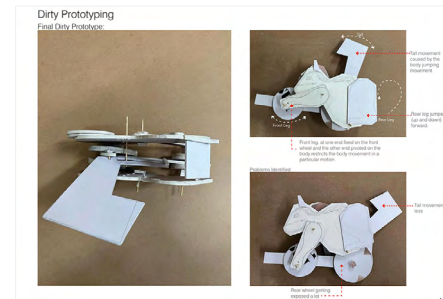
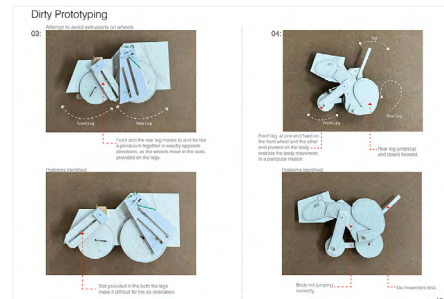
6B. Ride-on Toy - Group B

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### Poster



1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

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6Ah. Chani by Aamod Narkar

6Ahi. Case Study - Slide Show

6Ahii. Poster

6Ahiiii. Video

6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao

6Ap, 6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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## Video

Chani by Aamod Narkar



YouTube Video Link.....

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

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6Ah. Chani by Aamod Narkar

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6Ahiii. Video

6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao

6Ap, 6Aq, 6Ar, 6As, 6At, 6Au, 6Av

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah

6Ai. Rolly by Ashuj Chawda

6Ai i. Case Study - Slide Show

6Ai ii. Poster

6Ai iii. Video

6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

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## Rolly by Ashuj Chawda

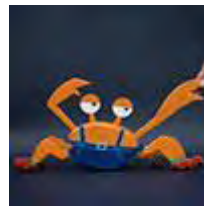
Toys are fun material objects for children's playing experience. For children aged from 15 to 24 months, a toy ignites their cognitive powers and stimulates their imagination. It also directs their behavior and interaction towards their parents, peers and environment.



Case Study - Slide Show



Poster



Video



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## Case Study - Slide Show

Case Study Download:

- **Rolly\_by Ashuj Chawda.....**
- **Rolly\_by Ashuj Chawda\_Report.....**

**PRODUCT DESIGN – 2**  
Toy Design  
Prof. Vijay Bapat

Chawda | 216130009

**Acknowledgement**

First of all, I would like to thank my Professor Mr. Vijay Bapat for guiding and motivating through the entire module. I came to learn more about animals and their associated limb/body movements that define them. I also learnt how we can incorporate various mechanisms to achieve these motions into some of the chosen animals for our toy project. I gave me a broader perspective and confidence to build things.

I would like to thank Alka ma'am for letting us use various tools and machines at the PoC Lab at IDC School of Design. Further I would also like to thank Rohit and Deepak sir for guiding through various tools at the PoC and Wood Lab.

I would like to thank my batchmate Prateek Pagore and others from the Mobility and Vehicle discipline for helping me with the mechanism where I found difficulty.

A sincere gratitude towards my classmates whose hard-work and perseverance brought more out of me. A further word of gratitude towards my B.Des. juniors who helped me with the laser cutting machine when Rohit sir was not around.

**Contents**

1. Introduction
  - 1.1. Opportunity
  - 1.2. Brief
2. Methodology
  - 2.1. Inspiration
  - 2.2. Research
  - 2.3. Ideation
  - 2.4. Mockups
  - 2.5. Prototypes
  - 2.6. Final concept
3. Toy Model – Rolly the crab

**1. INTRODUCTION**

Toys are fun material objects for children's playing experience. For children aged from 15 till 24 months, a toy ignites their cognitive powers and stimulates imagination. It also directs their behavior and interaction towards their parents, peers and environment.

**1.1. Opportunity**

As a product designer with the given role to design a toy, it is an exciting and fun learning experience to draw inspiration from the nature and make a simple and active working contraption that makes use of various mechanisms from the world of physics.

The following constraints are to be followed:

- a. It should be a simple push/pull toy made out of wood or related material.
- b. Other materials are to be used in minimal quantity only when there is a requirement.
- c. The toy should be inspired from nature that incorporates an associated motion.
- d. Toy should be easy and safe to operate.
- e. It should be able to withstand wear and tear for at least an year.
- f. The operating environment needs to be the interior of house or children's play area and on a smooth surface.
- g. The kids should be able to operate it while they are standing, walking or sitting.

**1.2. Brief**

The goal is to design and develop a simple push/pull toy for children aged around 15-24 months that is inspired from nature and replicates a specific associated motion of that selected inspiration in the form of various kinetic mechanisms related to physics; made from wood and related material.

**2. METHODOLOGY**

**2.1. Inspiration**

We are surrounded by nature that work and perform in very interesting, certain specific ways. Some have linear, some have curvy, some rotational, some spiral and some a mixture of these motions. These are some of the creatures that drew my attention and I have felt very inspired:

a. Praying mantis – limb motion

2.1(a). Praying mantis

b. Crab – lateral limb motion

2.1(b). Crab

c. Puffer fish – swelling motion (defense mechanism)

2.1(c). Puffer fish

**2.2. Ideation**

Initially, I started working with praying mantis. I found the boxing motion of the front limbs and sideways motion of the rear limbs to be very interesting. With the use of cranks and linked parts, this motion can be achieved. But considering the thickness of the limbs and the quantity of linked parts was making it impossible for it to be produced for small children. So, I moved towards the next inspiration: Crab.

2.2(a). Motion for praying mantis

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah

6Ai. Rolly by Ashuj Chawda

6Ai i. Case Study - Slide Show

6Ai ii. Poster

6Ai iii. Video

6Aj, 6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

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6Aq, 6Ar, 6As, 6At, 6Au, 6Av

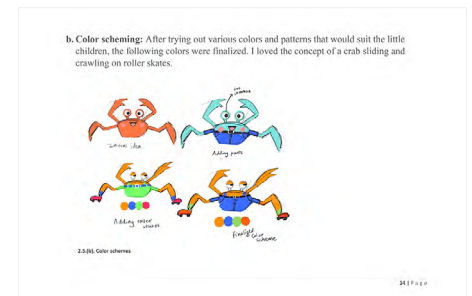
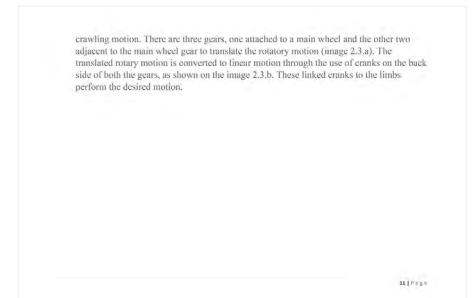
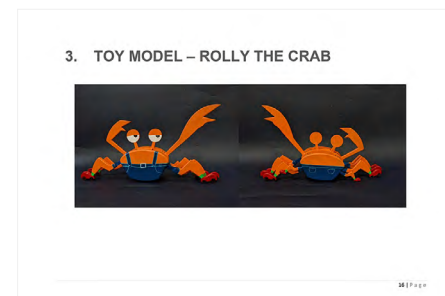
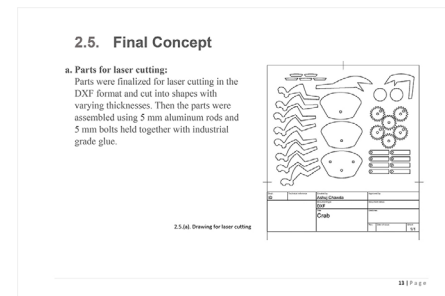
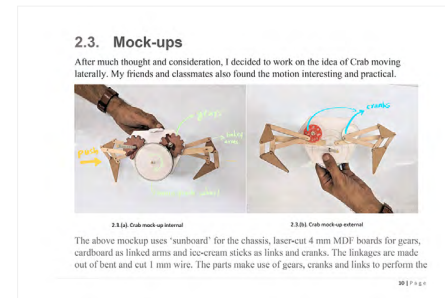
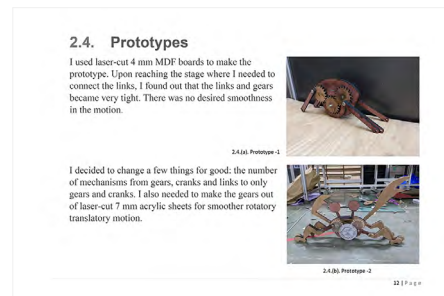
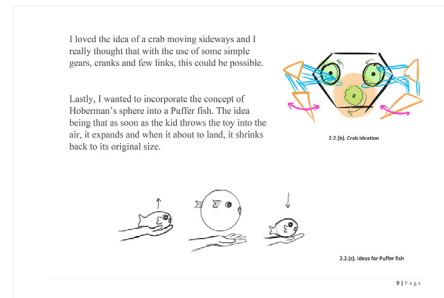
6B. Ride-on Toy - Group B

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## Poster



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6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

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6B. Ride-on Toy - Group B

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Rolly by Ashuj Chawda



YouTube Video Link.....

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Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/chef-olie-athira-e>

## Chef Olie by Athira E

The aim of the project is to design a push toy for kids aged 15-24 months. The design must take inspiration from nature by using Bionics and Biomimetic principles to analyse the movements, and physiology of animals and incorporate them in the final design.



Case Study - Slide Show

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah, 6Ai

6Aj. Chef Olie by Athira E

6Aj i. Case Study - Slide Show

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap, 6Aq

6Ar, 6As, 6At, 6Au, 6Av

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6Ah, 6Ai

6Aj. Chef Olie by Athira E

6Aj i. Case Study - Slide Show

6Ak, 6Al, 6Am, 6An, 6Ao, 6Ap, 6Aq

6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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## Case Study - Slide Show

Case Study Download:

• Chef Olie by Athira E.....



Product design -2  
**TOY DESIGN**  
Athira E, 216130003

**Content**


- Design brief
- Animal Inspiration and ideations
- Final Inspiration
- Mechanism
- Mock up
- Final 3d render
- Mechanism and final model
- Logo and branding
- Poster

**Design brief**

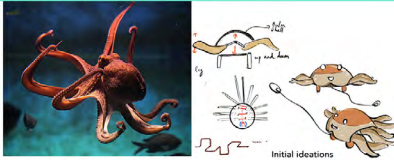
Design a push toy for kids of age 15-24 months. The design must take inspiration from nature by using Bionics and Biomimetic principles to analyse the movements, physiology of animals and incorporate them in final design.

**Objective**

- Wooden Toy should be capable of mass producing
- Affordable cost
- Age appropriate toy
- Safety
- Easy to operate, visually approachable for kids
- Withstand wear and tear




**Inspiration 1- Octopus**




Beautiful organic movement of the arms of octopus was the interesting factor for me to select octopus for my toy. Octopus has got 8 arms and are seen in different colours. Octopus can be scary for kids most time but the cartoon presentation of octopus have always been cute and joyful.

**Inspiration 2- Butterfly**



Butterflies have been one of the most beautiful creature in the world. Kids and adults equally enjoy the movement and flapping of the wings of butterflies and the amazing colours and the patterns on their body adds on its beauty. This made me chose butterfly as my second option.


**Inspiration 2- Butterfly**




Lady bugs are the tiny beetles which has got polka patterns of black and red on their body. Most people like ladybugs because they are pretty, graceful, and harmless to humans. The beautiful pattern and cute structure of lady bug wo is always subtle and graceful was the reason I chose it as my third option for my toy.

**Final Inspiration chosen- Octopus**

Referred to many original images of octopus and its movement in land as well as in water, also some videos and pictures to understand how octopus is been presented to the kids.




Pictures of Octopus and its movement in water.



Cartoon images of octopus

**Initial mechanism**

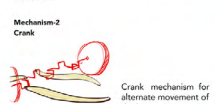
**Mechanism-1**




Up and down mechanism for the arm : Arms connected to a circular ring which is connected to the wheel which turn and cause the up and down movement

**Mechanism-2**


Crank



Crank mechanism for alternate movement of the legs




**Mechanism-3**

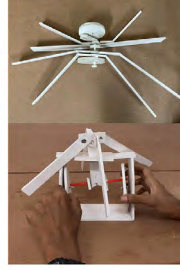


Arms pivoted in alternate points and joined off centered to the wheel so that each legs moves alternately creating interesting movement.

**Mechanism-4**



Closure & spreading out of arms





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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah, 6Ai, 6Aj

6Ak. Sting Ray by Infant Bibin I

6Aki. Stage 1 Presentation

6Aki. Case Study - Slide Show

6Aki. Poster

6Al, 6Am, 6An, 6Ao, 6Ap, 6Aq, 6Ar,

6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

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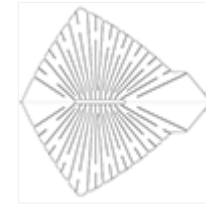
10. Contact Details

## Sting Ray by Infant Bibin I

The aim of the project is to design a wooden pull toy for kids that is mechanically operated and the motion should be biomimicry-inspired.



Stage 1 Presentation



Case Study - Slide Show



Poster



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6Aki. Poster

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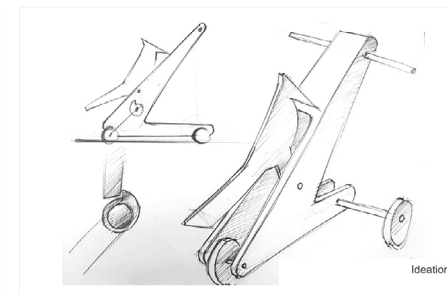
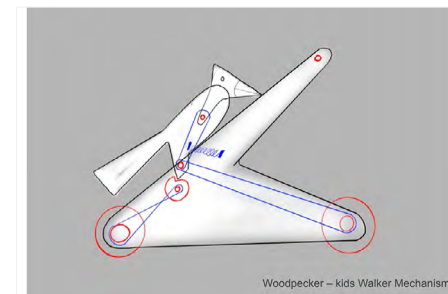
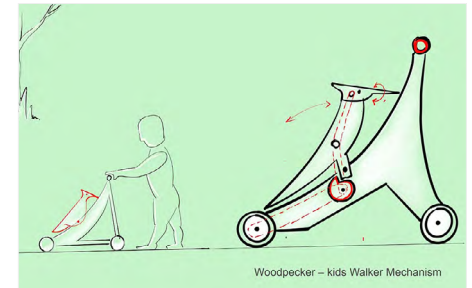
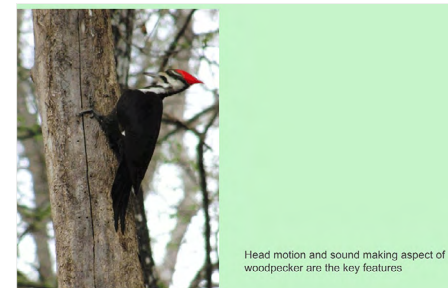
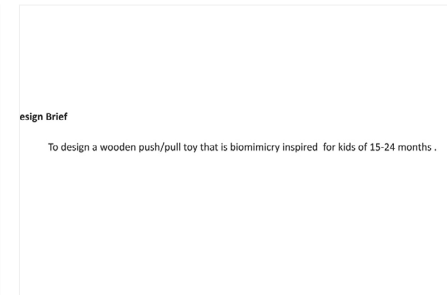
9. Video

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## Stage 1 Presentation

Download:

- [Sting Ray\\_Stage 1 Presentation\\_by Infant Bibin I.....](#)



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6Ah, 6Ai, 6Aj

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6Aki. Stage 1 Presentation

6Aki. Case Study - Slide Show

6Aki. Poster

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6As, 6At, 6Au, 6Av

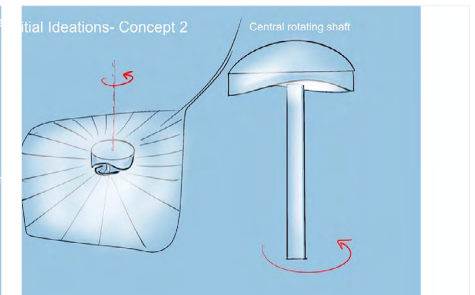
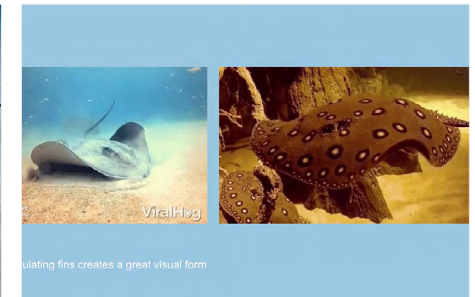
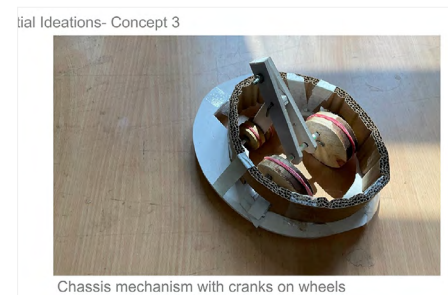
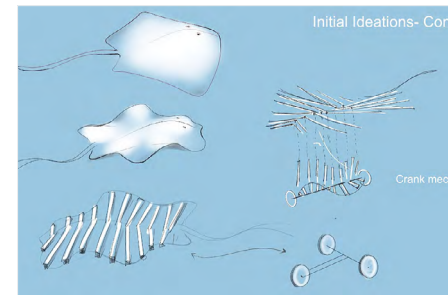
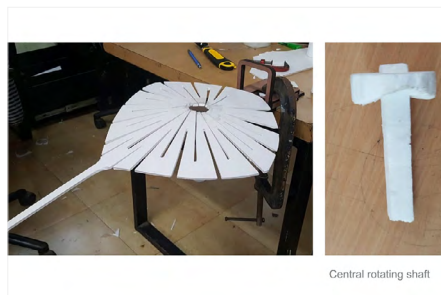
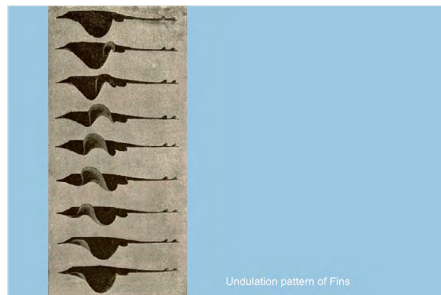
6B. Ride-on Toy - Group B

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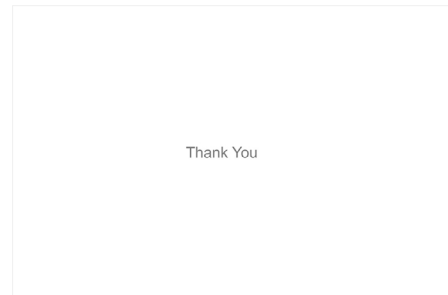
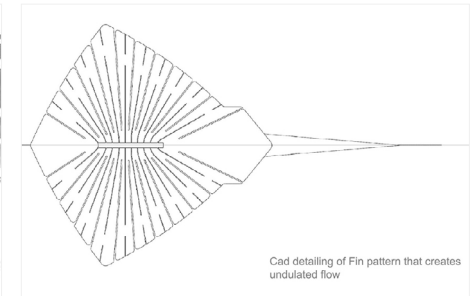
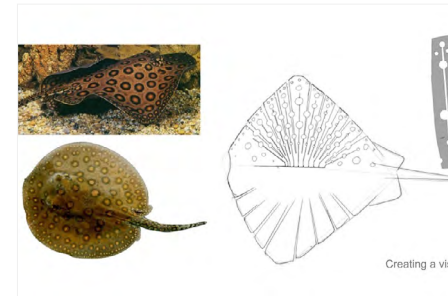
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6Ak. Sting Ray by Infant Bibin I

6Aki. Stage 1 Presentation

6Aki. Case Study - Slide Show

6Aki. Poster

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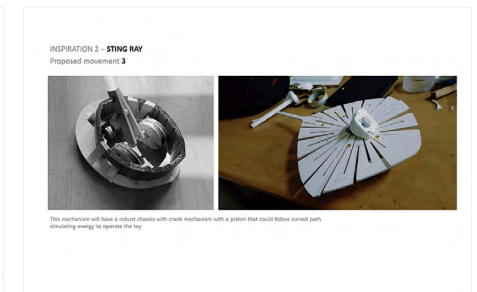
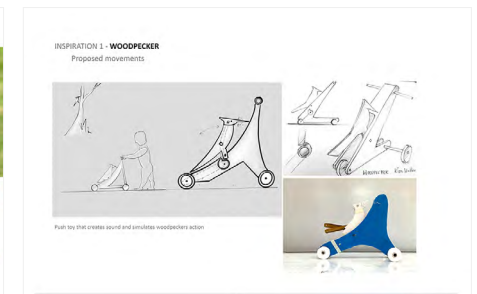
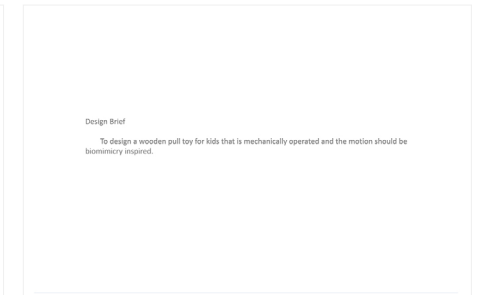
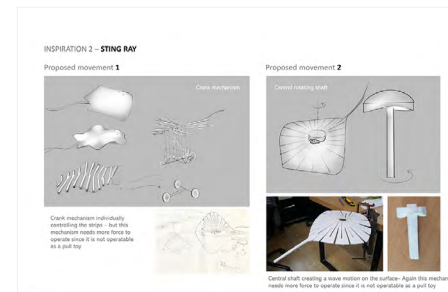
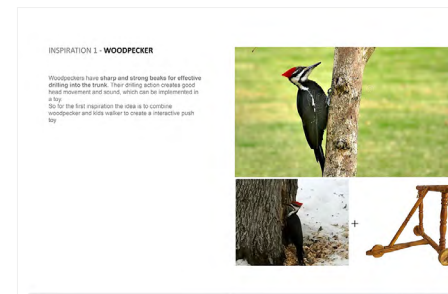
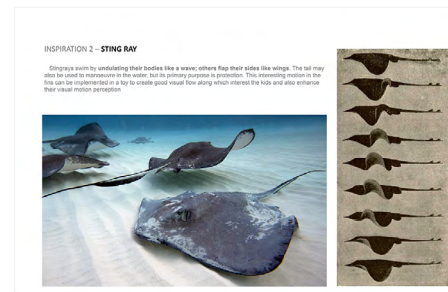
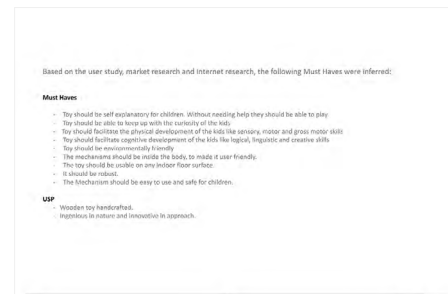
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## Case Study - Slide Show

Case Study Download:

• [Sting Ray\\_by Infant Bibin I.....](#)



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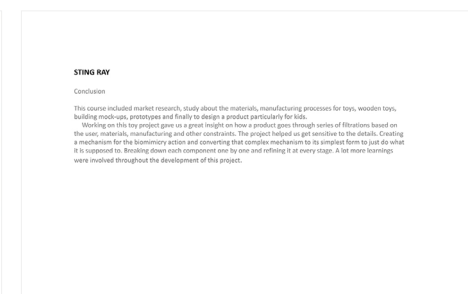
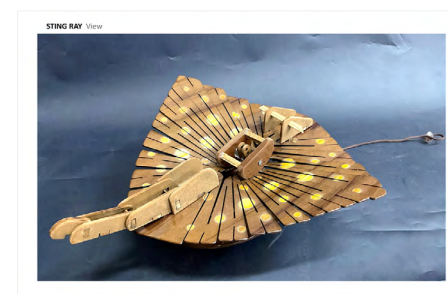
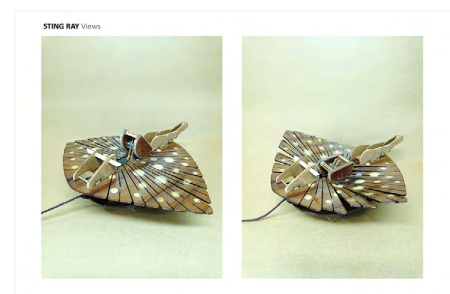
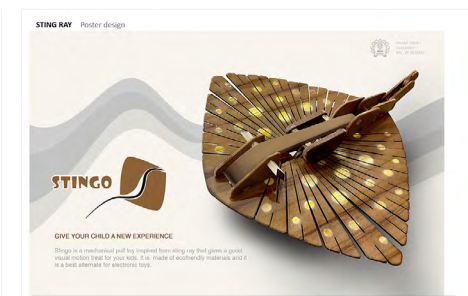
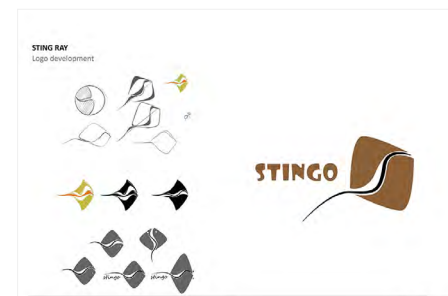
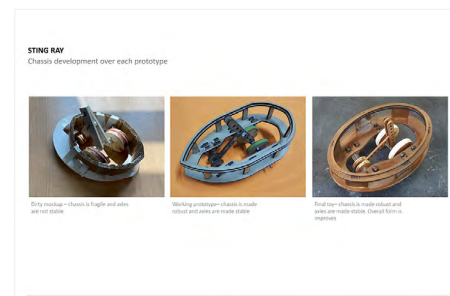
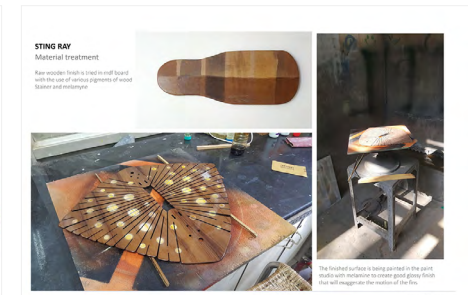
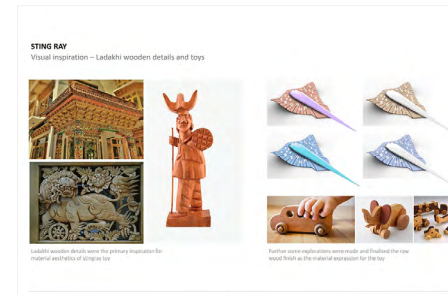
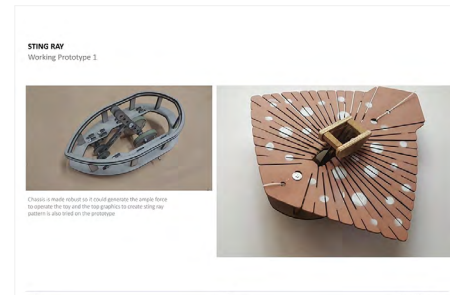
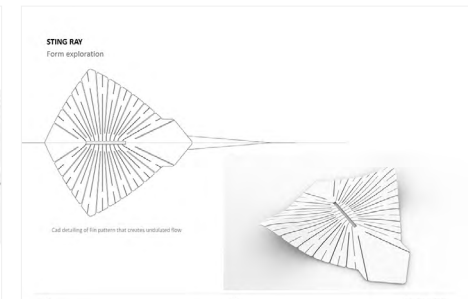
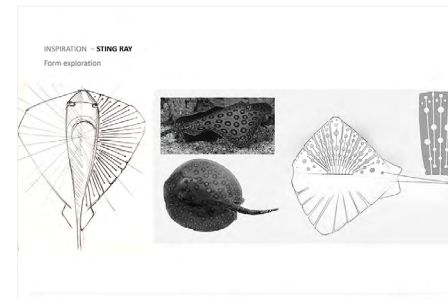
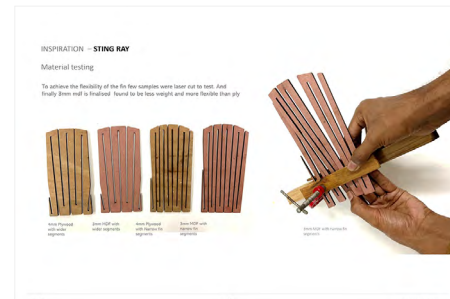
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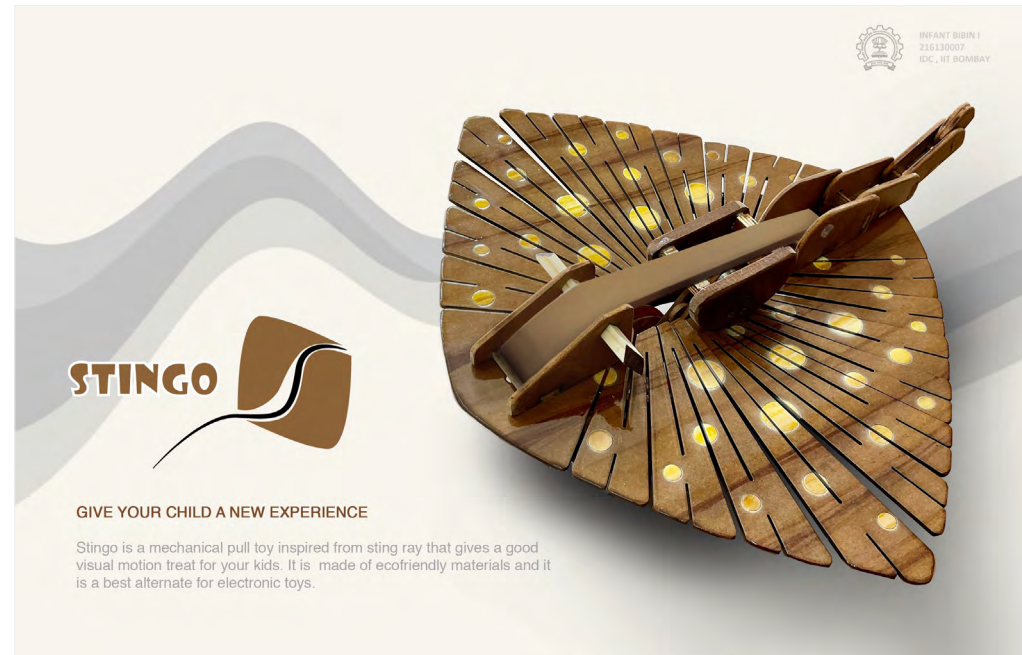
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## Poster



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## Akira by Mohammed Hazique Kola

The aim of the project is to design a wooden toy for kids of the age group 9-15 months. It should be safe in terms of its material and edge treatment. It must be sturdy to withstand wear and tear. Kids should operate it by themselves by either pushing or pulling the toy.

Varied elements such as sound, light, and mechanical movement must be incorporated so as to create curiosity. The toy must mimic the biomechanical movements and offer a visually unique experience.



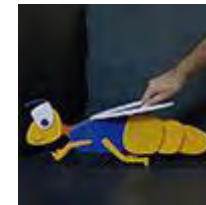
Stage 1 Presentation



Poster



Case Study - Slide Show



Video



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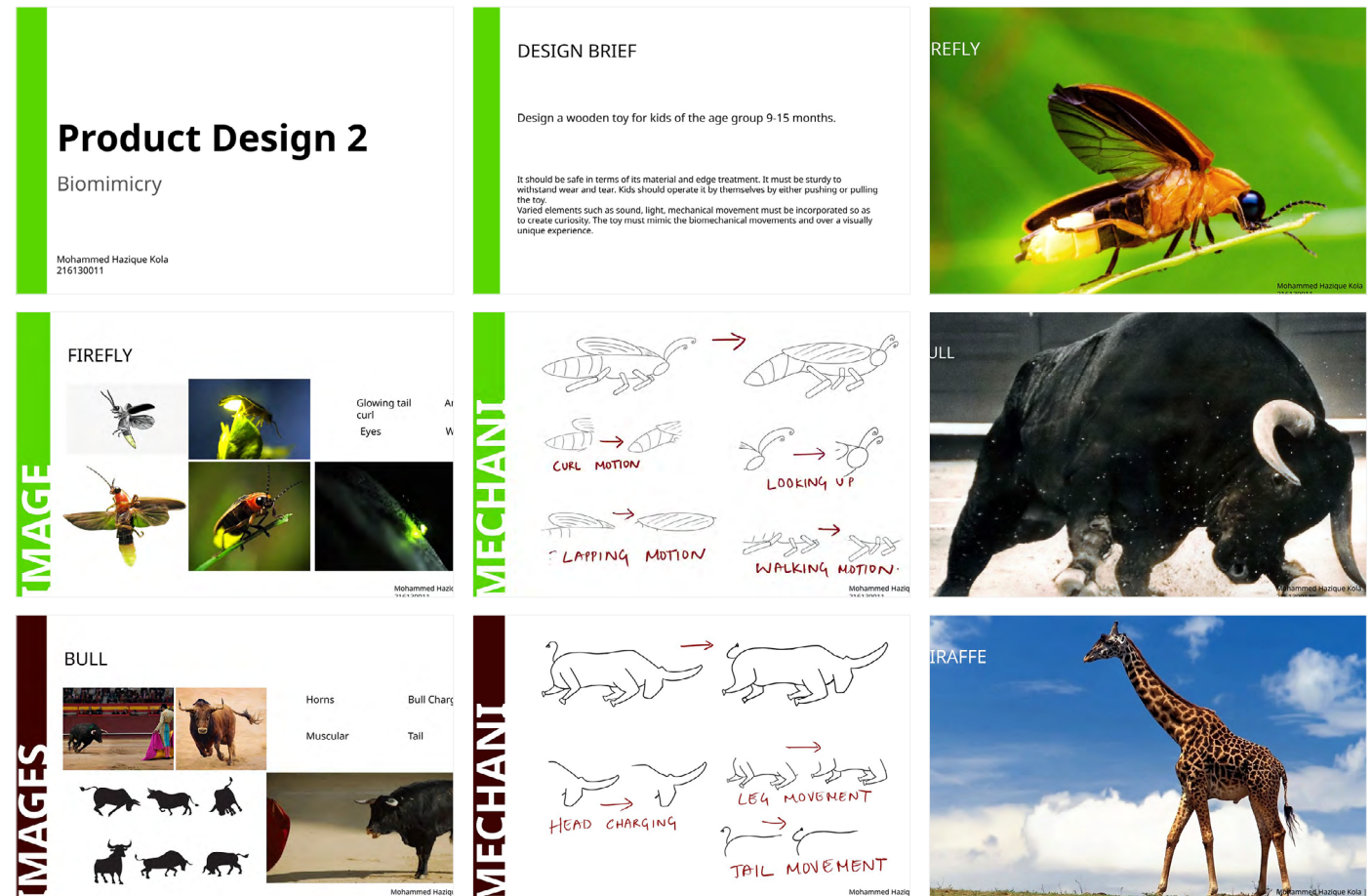
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## Stage 1 Presentation

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• [Akira\\_Stage 1 Presentation\\_by Mohammed Hazique Kola.....](#)





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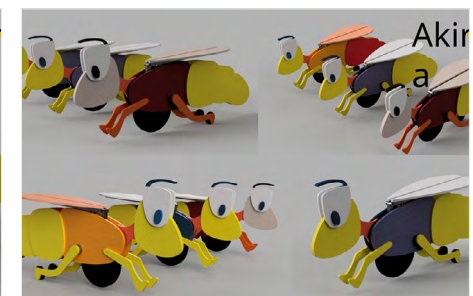
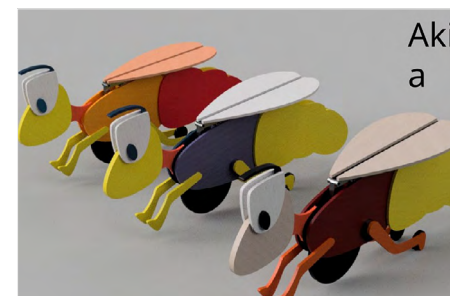
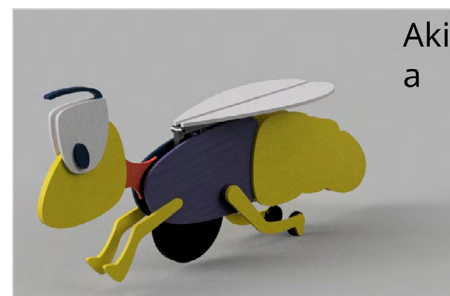
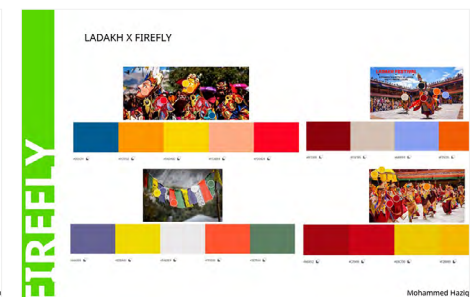
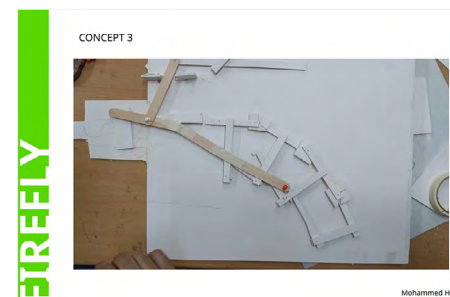
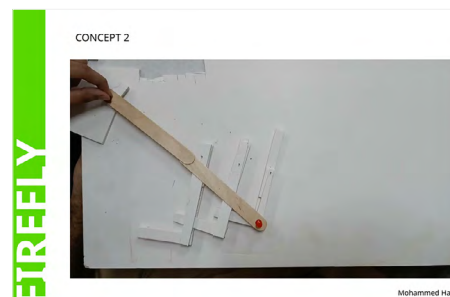
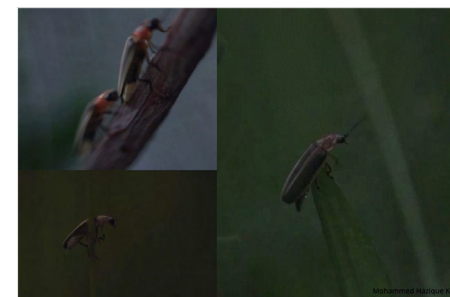
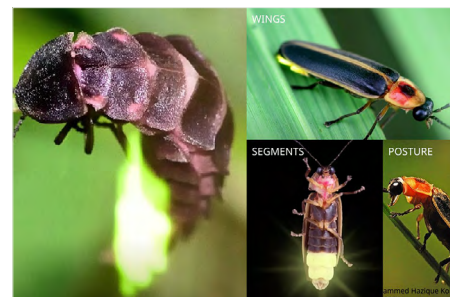
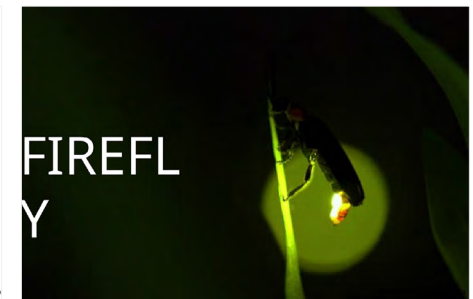
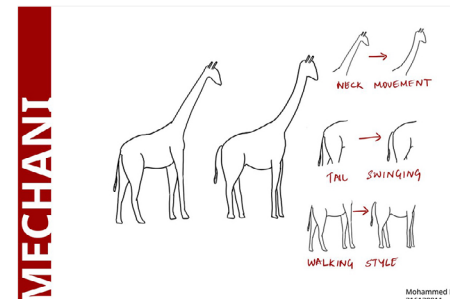
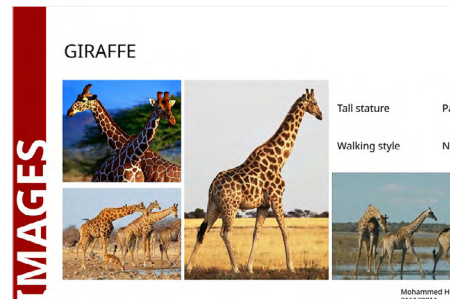
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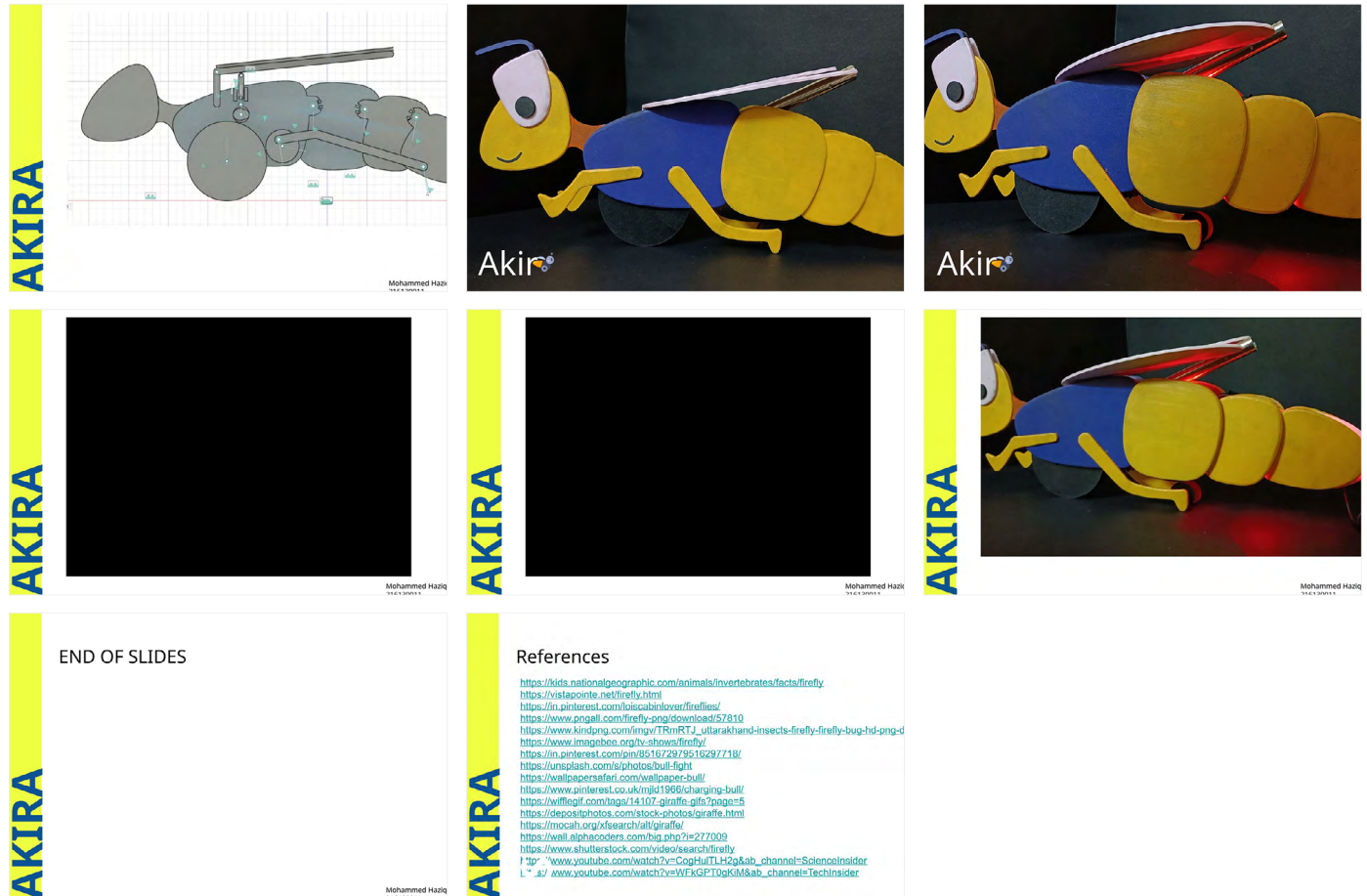
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## Case Study - Slide Show

Case Study Download:

• Akira\_by Mohammed Hazique Kola.....

### Product Design - 2

Toy Design



Mohammed Hazique Kola  
216130011

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7. 3D modelling and prototyping
8. Final concept
9. Logo
10. Poster

### Design brief

Design a wooden toy for kids of the age group 9-15 months.


It should be safe in terms of its material and edge treatment. It must be sturdy to withstand wear and tear. Kids should operate it by themselves by either pushing or pulling the toy.  
Varied elements such as sound, light, mechanical movement must be incorporated so as to create curiosity. The toy must mimic the biomechanical movements and over a visually unique experience.

### Design Process

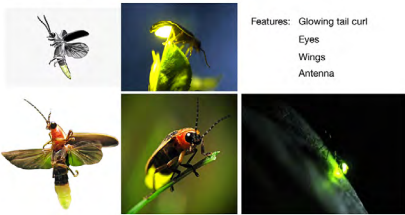
Research — Biomimicry Inspirations — Exploration of mechanisms — Finalization of mechanism and prototyping — Final concept

### Biomimicry Inspiration

FIREFLY

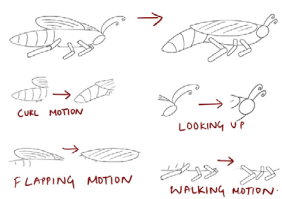


### Firefly exploration




Features: Glowing tail curl  
Eyes  
Wings  
Antenna

### Firefly exploration

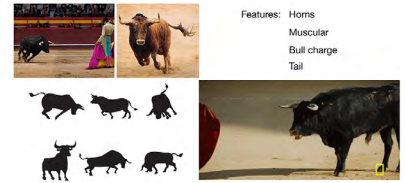


### Biomimicry inspiration

BULL



### Bull exploration



Features: Horns  
Muscular  
Bull charge  
Tail



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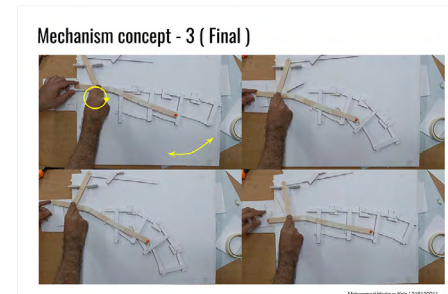
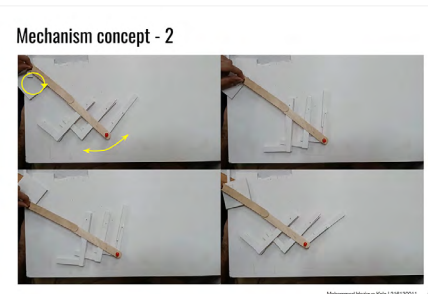
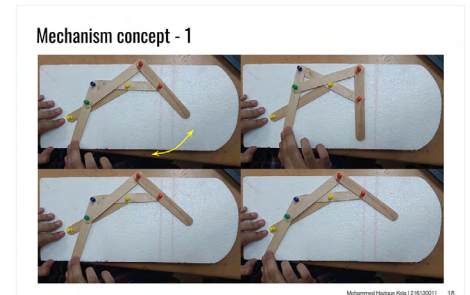
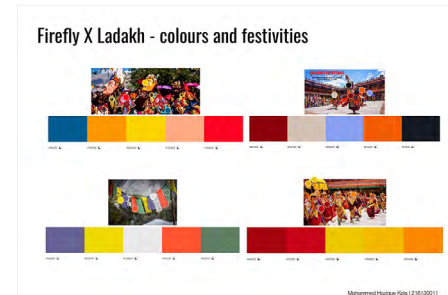
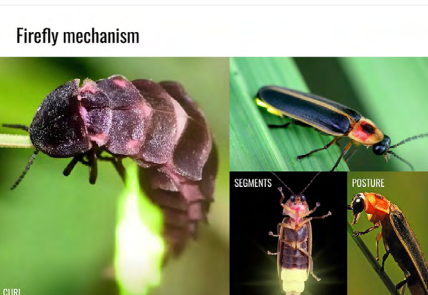
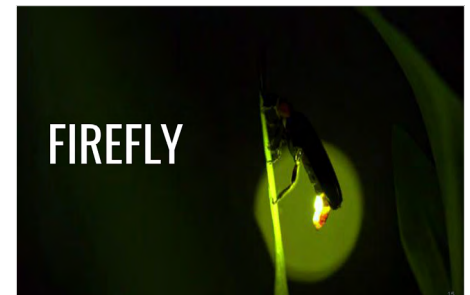
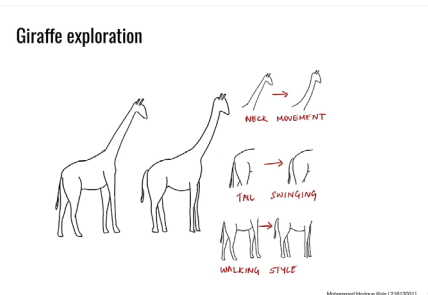
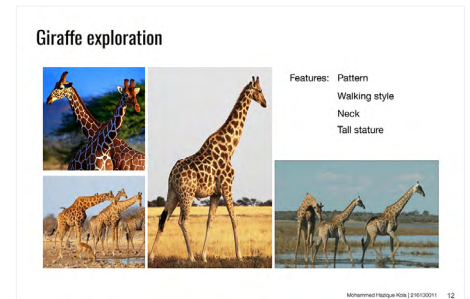
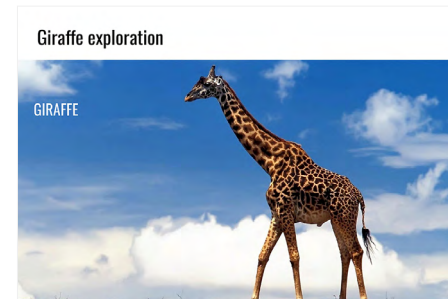
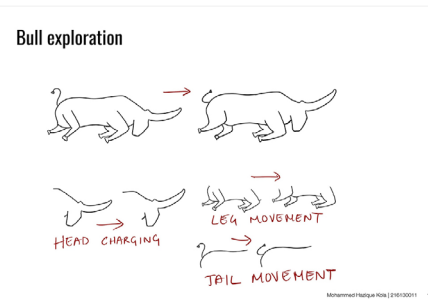
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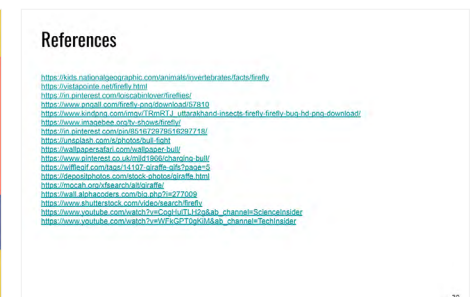
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## Poster



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## Indian Toy Design

Biomimicry-inspired toys

by

Prof. Vijay Bapat

IDC, IIT Bombay

Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/akira-mohammed-hazique-kola/video>

## Video

Akira by Mohammed Hazique Kola

YouTube Video Link.....

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah, 6Ai, 6Aj, 6Ak

6Al. Akira by Mohammed H. K.

6Ali. Stage 1 Presentation

6Alii. Case Study - Slide Show

6Aliii. Poster

6Aliv. Video

6Am, 6An, 6Ao, 6Ap, 6Aq, 6Ar, 6As

6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

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6Ah, 6Ai, 6Aj, 6Ak, 6Al

6Am. Buzz by Mugdha Dengle

6Ami. Stage 1 Presentation

6Amii. Case Study - Slide Show

6Amiii. Poster

6An, 6Ao, 6Ap, 6Aq, 6Ar, 6As, 6At

6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

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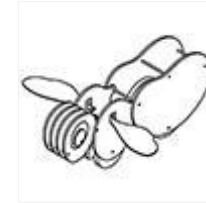
10. Contact Details

## Buzz by Mugdha Dengle

This project is done as part of the PD2 module. The primary objective is to design a wooden toy for kids between the age group of 9 to 24 months. The primary material to be used is mdf. The design of the toy is to be inspired by nature-based animal biomimicry.



Stage 1 Presentation



Case Study - Slide Show



Poster



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6Ami. Stage 1 Presentation

6Amii. Case Study - Slide Show

6Amiii. Poster

6An, 6Ao, 6Ap, 6Aq, 6Ar, 6As, 6At

6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

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## Stage 1 Presentation

Download:

- [Buzz\\_Stage 1 Presentation\\_by Mugdha Dengle.....](#)

**WOODEN TOY DESIGN**  
COURSE FACULTY: PROF. VIJAY BAPAT

- MUGDHA DENGLE  
216  
IDC, IIT BC

**CONTENTS**

- Introduction
- Objective
- Market research
- Web research
- Design brief
- Ideations
- Concept
- Final design

**INTRODUCTION**

- This project is done as part of PD2 module.
- The primary objective is to design a wooden toy for kids between age group of 9 to 15 months. And the primary material to be used is wood.
- The design of toy is to be inspired from nature based biomimicry.

**OBJECTIVE**

- The toy should communicate with children.
- It should be relatable and generate curiosity in them.
- It should be easy to operate by push/pull mechanism.
- The mechanisms should be inside the body, to make it user friendly.

**MARKET RESEARCH**

**WEB RESEARCH**

**DESIGN BRIEF**

" To design and develop a biomimetic toy inspired from an animal for children in age group of 9- 15 months old. "

**IDEATIONS**

- Octopus
- Peacock
- Whale
- Bumble bee

**OCTOPUS**

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6Ami. Stage 1 Presentation

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6Amiii. Poster

6An, 6Ao, 6Ap, 6Aq, 6Ar, 6As, 6At

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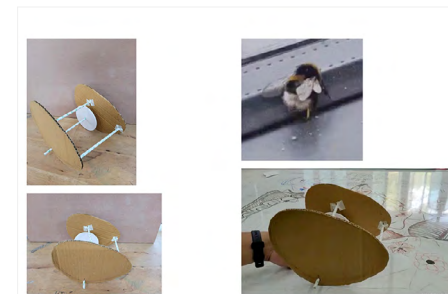
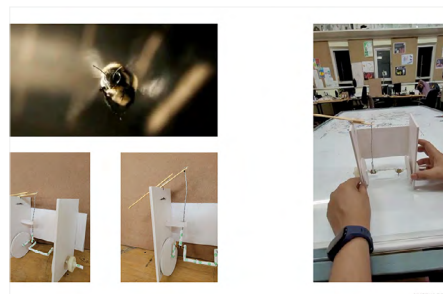
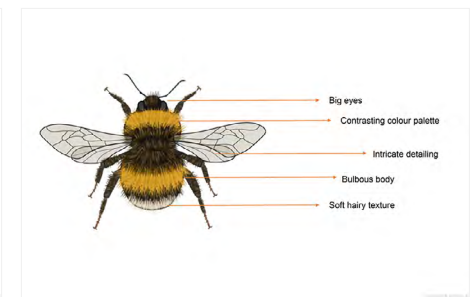
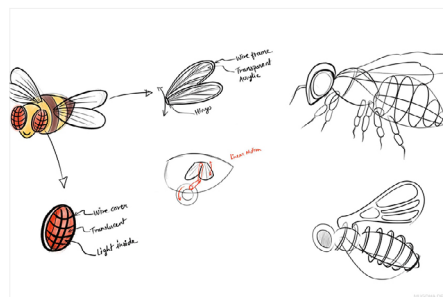
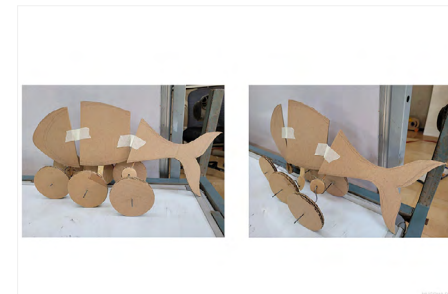
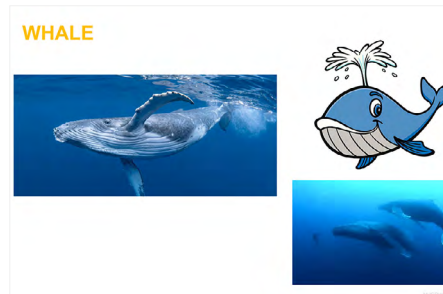
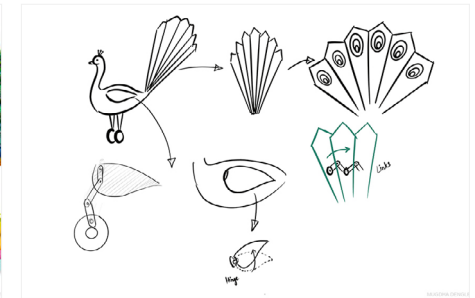
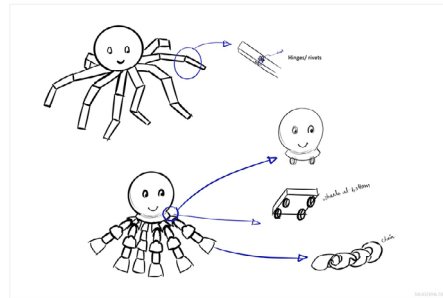
6B. Ride-on Toy - Group B

7. Toys

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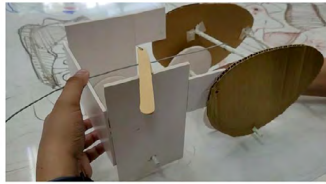
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6Amiii. Poster

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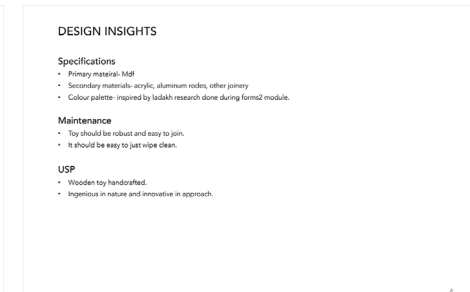
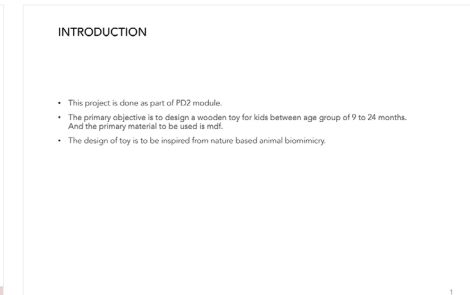
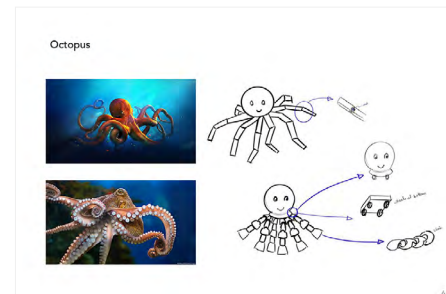
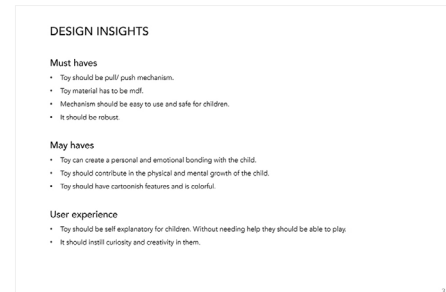
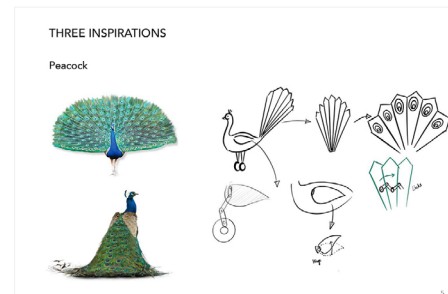
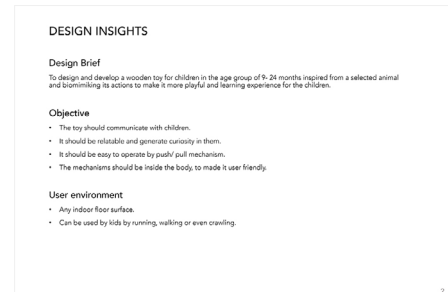
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## Case Study - Slide Show

Case Study Download:

- **Buzz\_by Mugdha Dengle.....**



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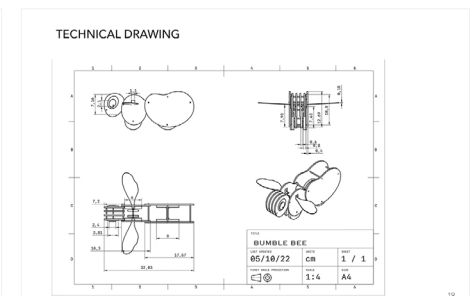
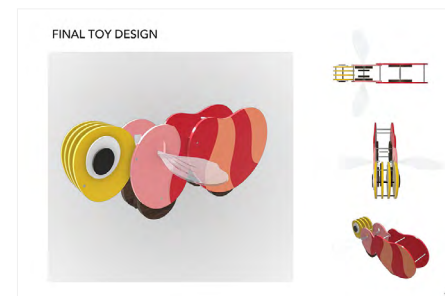
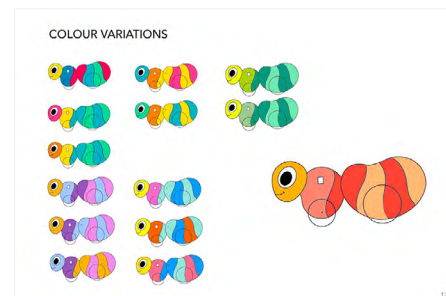
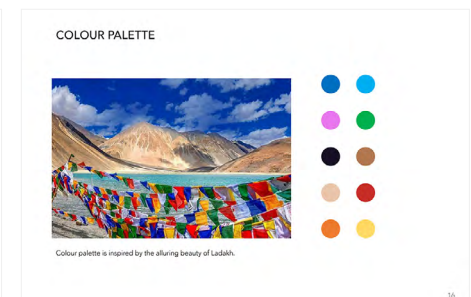
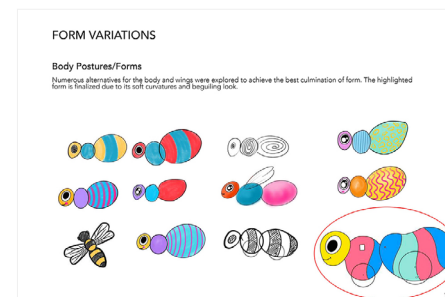
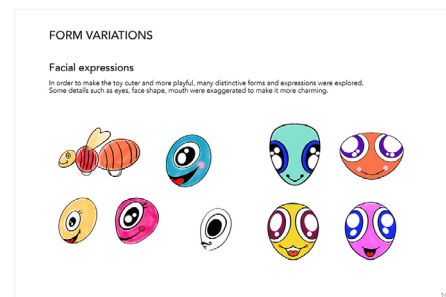
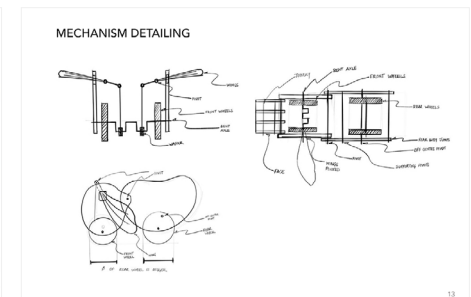
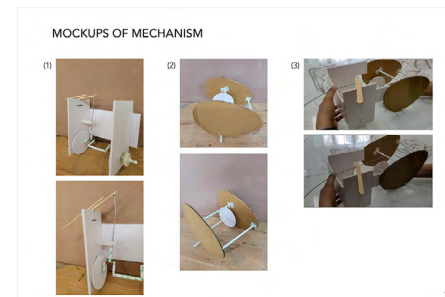
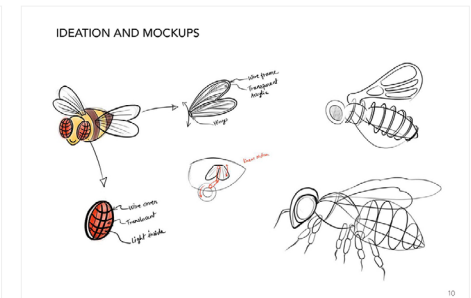
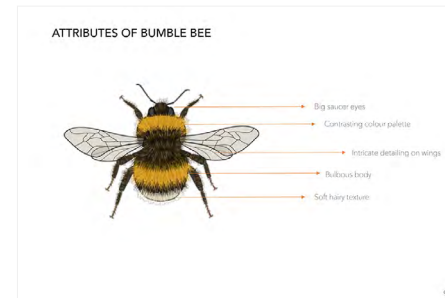
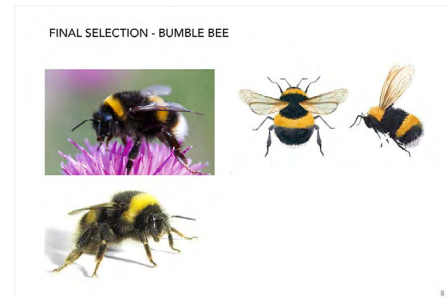
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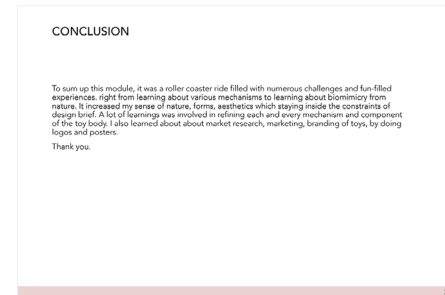
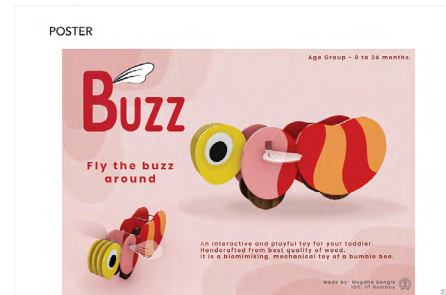
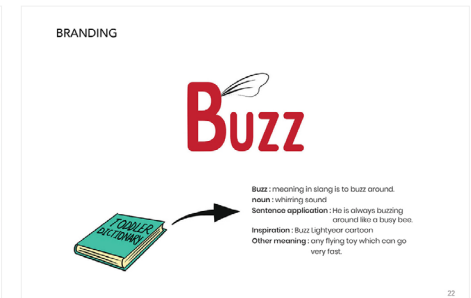
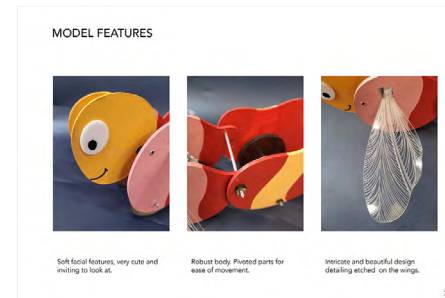
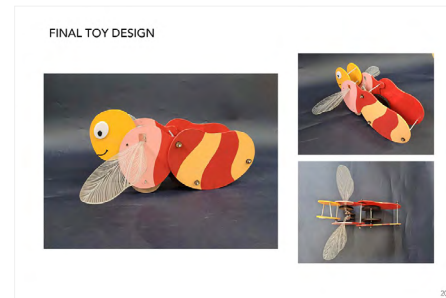
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## Poster



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6Av

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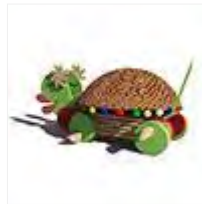
## Tooti by Naiga Catherine

The aim of the project is to design a wooden toy for kids of age group 9 to 15 months.

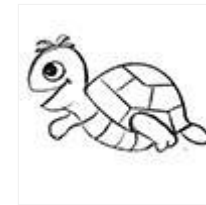
- taking bionic inspiration
- facilitates movement
- evokes an element of surprise in kid
- That should be safe in its form, function and material
- And approachable



Stage 1 Presentation



Poster



Case Study - Slide Show



Video



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6Av

## 6B. Ride-on Toy - Group B

7. Toys

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9. Video

10. Contact Details

## Stage 1 Presentation

Download:


• **Tooti\_Stage 1 Presentation\_by Naiga Catherine.....**



**Product Design 2**

Toy design

Naiga Catherine  
216130005



**Design Brief**

"To design a wooden toy for kids of a group 9 to 15 months

- taking bionic inspiration
- facilitates movement while pulling
- evokes an element of surprise in kid
- That should be safe in its form, function and ma

**Design Process**

```


graph LR
    Research --> Literature[Literature, user and market study]
    Literature --> Inspiration[Finding inspiration from nature and studying it]
    Inspiration --> Sketching[Sketching initial concepts and making mock-up models - 3 numbers]
    Sketching --> Proto
  
```


**Smart Toys for Babies**

•Nursery mobile.  
Objects dancing above a baby's head while lying in a crib stimulate vision and develop attention span.


•Ring stack.  
This classic toy features a cone that fits different sized colored rings. At first, babies enjoy holding and mouthing the rings. Later, they practice fine motor skills by fitting the rings onto the cone. Toddlers also learn about colors and numbers when you count the multicolored rings as you stack them.

•Push-pull toys.  
These help with balance and large-muscle development as the child goes from a crouch suffer to a walker. The more babies push and pull, the more they work the muscles necessary to turn them into runners and climbers. It also helps in problem-solving, whole-body coordination, and fine motor strength.






•Ring stack





•Push pull toys



•Nursery mobile

**Market study - Pull toy**





**Primary requirements**


- Safe material
- Safe form without sharp edges
- Should be long lasting - withstand wear and tear
- Should hold the interest of child for a longer time
- Easy to operate and visually approachable


**Secondary requirements**

- Should be relatable to their surrounding environm
- Should help in developing sensory, fine motor an
- Should provide a personalized experience to kid.
- Should communicate well with the kid
- Should be unpredictable in case of its movement

**Initial ideations**

- Keeping in mind the user studies, market studies, and bionic inspiration, 3 ideations were made considering what should be the movement and which all parts should be moved while the toy pulled.
- Quick models were made to understand the working mechanism of the selected options.
- This process helped in understanding the scale and proportions of each part and the toy as a whole.





**Option 1**

spider

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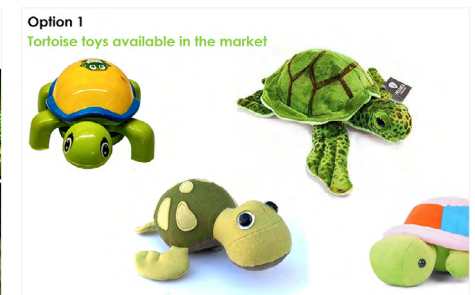
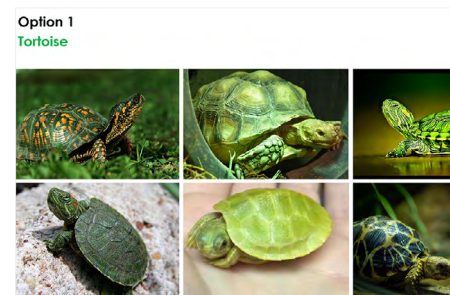
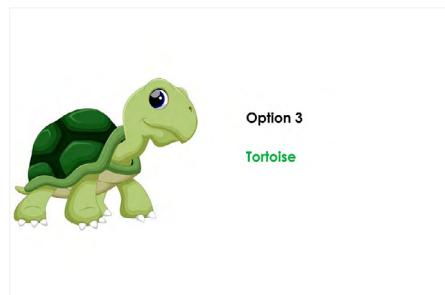
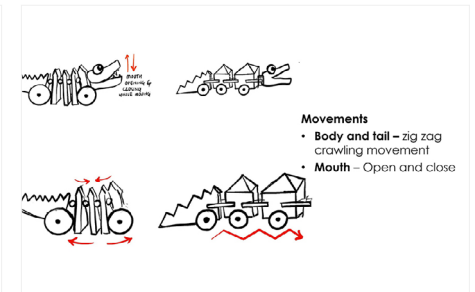
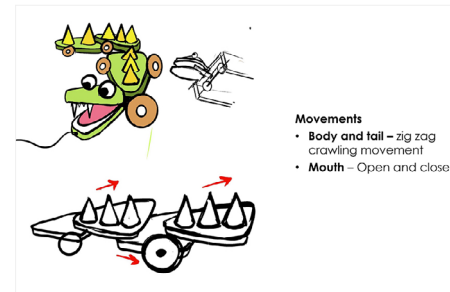
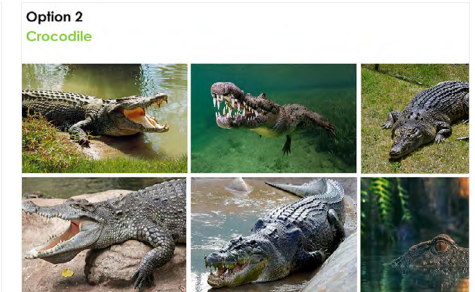
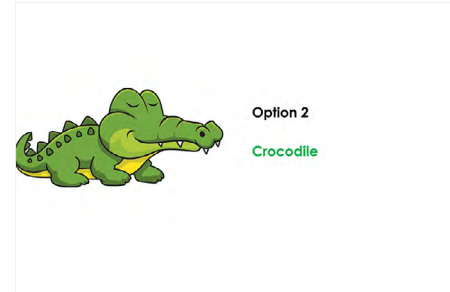
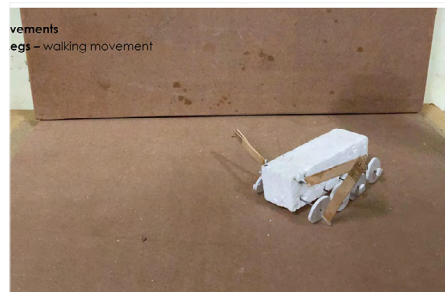
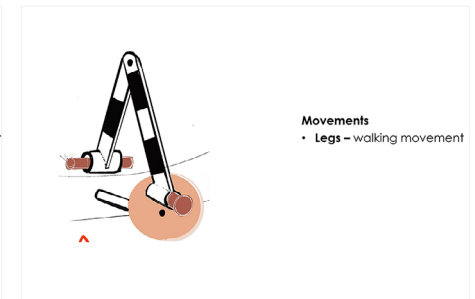
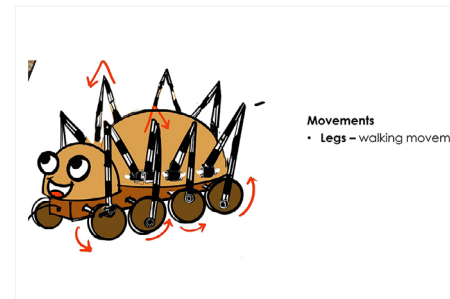
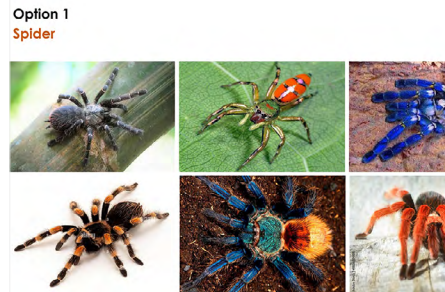
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6Aniii. Poster

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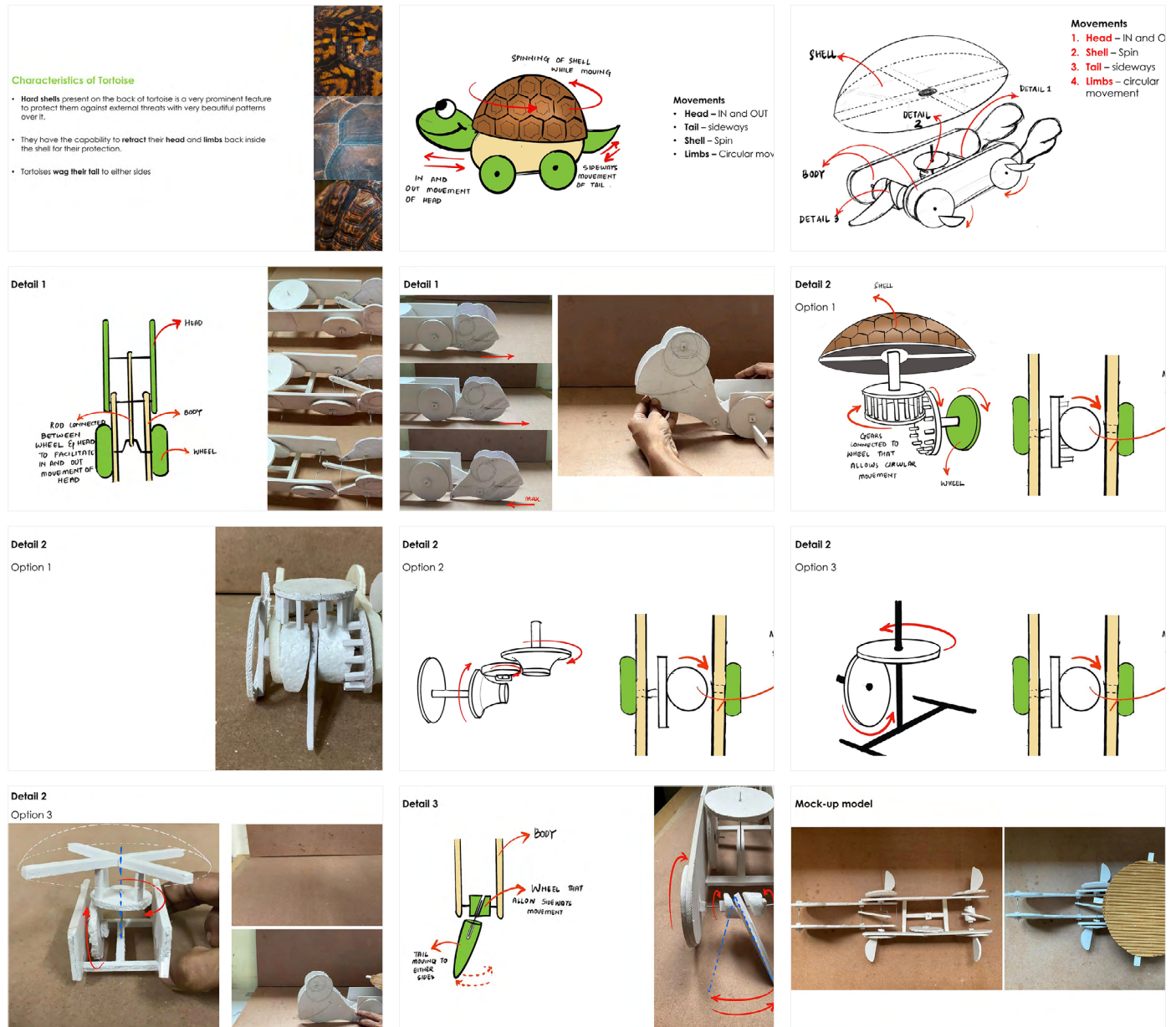
6B. Ride-on Toy - Group B

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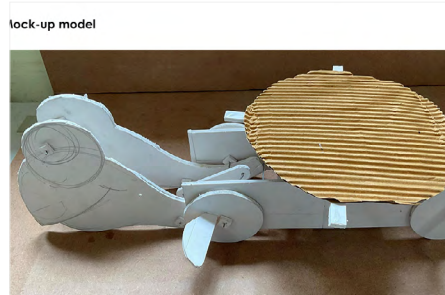
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Biomimicry-inspired toys

by

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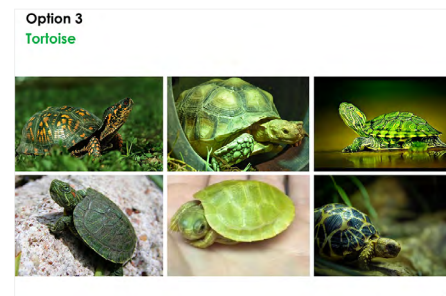
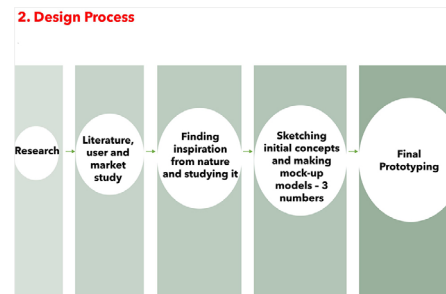
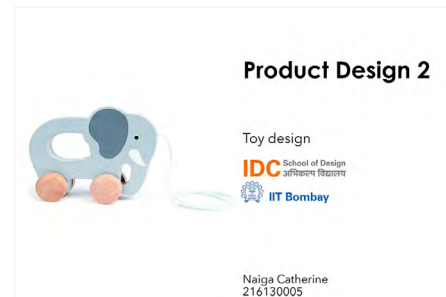
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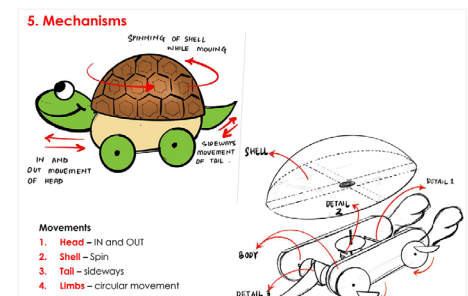
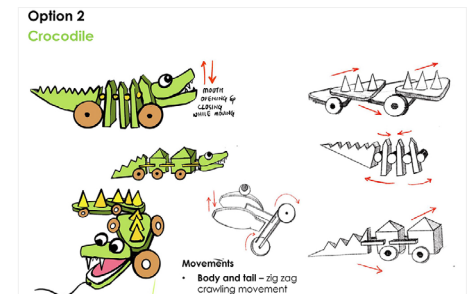
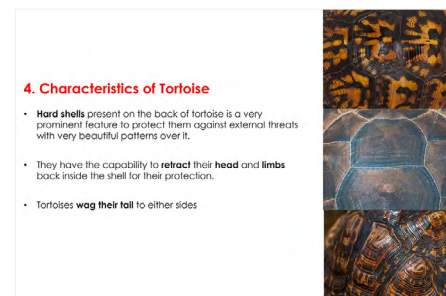
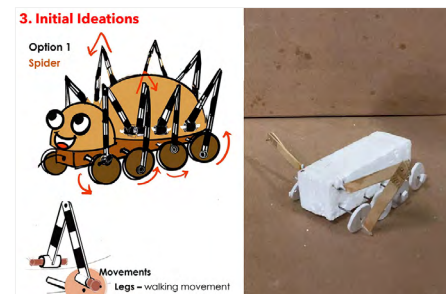
## Case Study - Slide Show

Case Study Download:

• **Tooti by Naiga Catherine.....**

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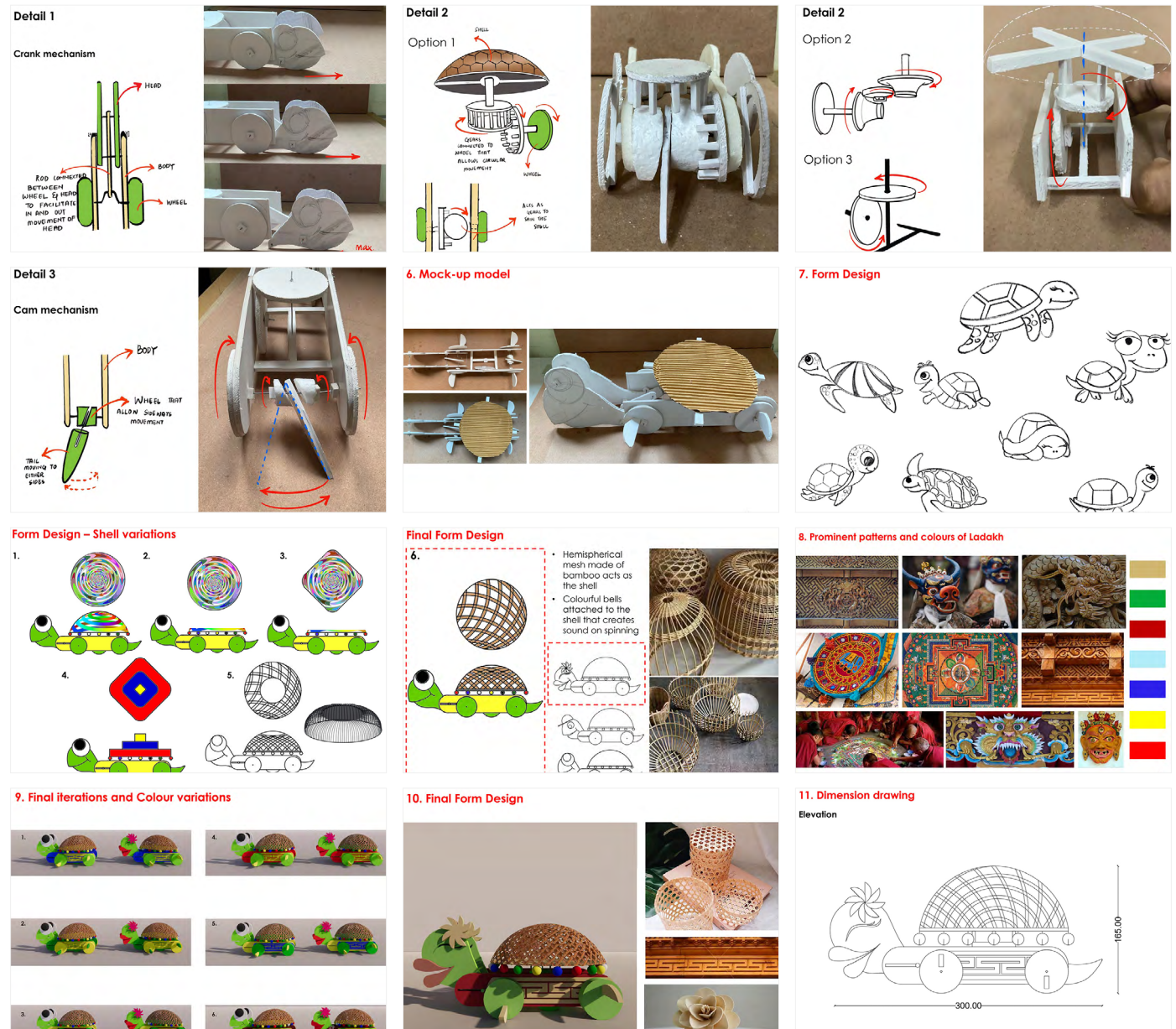
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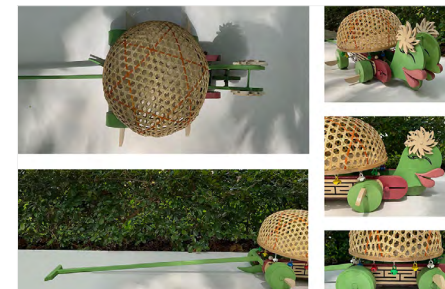
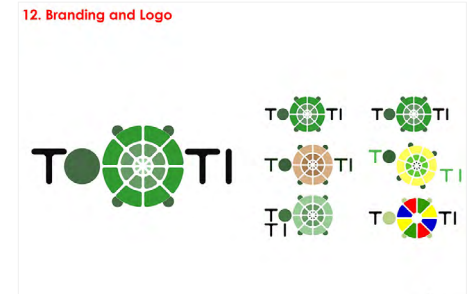
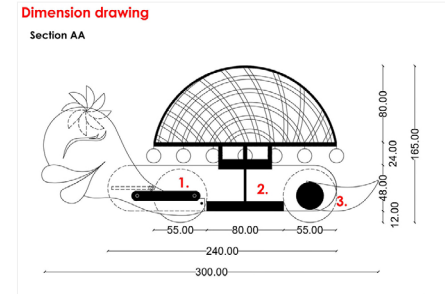
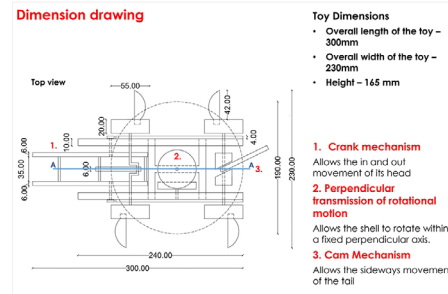
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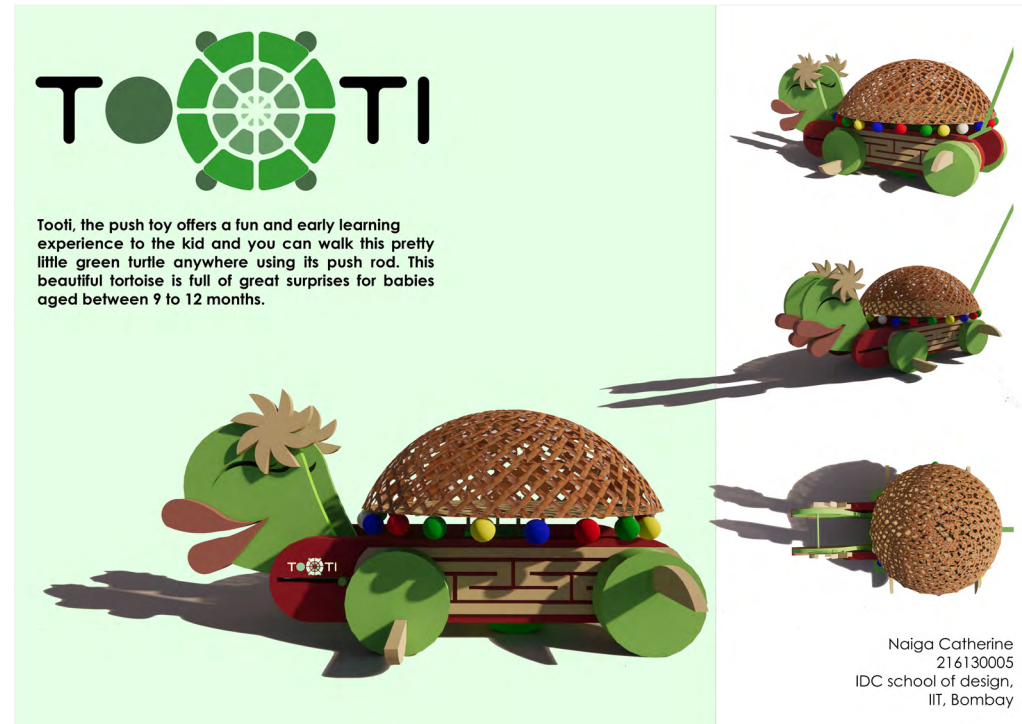
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Tooti by Naiga Catherine



YouTube Video Link.....

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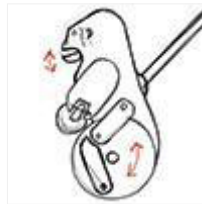
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## Go Bananas by Parth Rathod

The aim of the project is to design a wooden toy for kids of the age group 15-24 months.

- It should be safe in terms of its material and edge treatment.
- It must be sturdy to withstand wear and tear.
- Kids should operate it by themselves by either pushing or pulling the toy.
- Varied elements such as sound, light, mechanical movement must be incorporated so as to create curiosity.
- The toy must mimic the bio-mechanical movements of an animal and provide a visually unique experience.



Stage 1 Presentation



Case Study - Slide Show



Poster



Video

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6Ao. Go Bananas by Parth Rathod

6Aoi. Stage 1 Presentation

6Aoi. Case Study - Slide Show

6Aoi. Poster

6Aoi. Video

6Ap, 6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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## Stage 1 Presentation

Download:

• [Go Bananas\\_Stage 1 Presentation\\_by Parth Rathod.....](#)



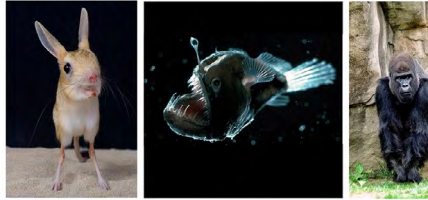
**Biomechanic wooden toy**  
Product design 2  
216130001 Parth Rathod

**Brief**

Design a wooden toy for kids of the age group 9-15 months.


It should be safe in terms of its material and edge treatment. It must be sturdy to withstand wear and tear. Kids should operate it by themselves by either pushing or pulling the toy. Varied elements such as sound, light, mechanical movement must be incorporated so as to create curiosity. The toy must mimic the biomechanical movements and provide a visually unique experience.

**Animal Inspirations**



JERBOA      ANGLER FISH      GORILLA

**Angler Fish**



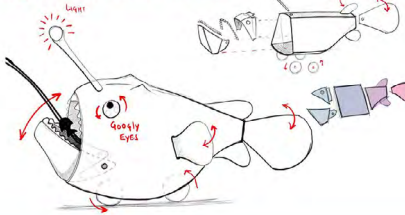
**Unique Features**

- Light
- Jaw snapping
- Visually Surprising

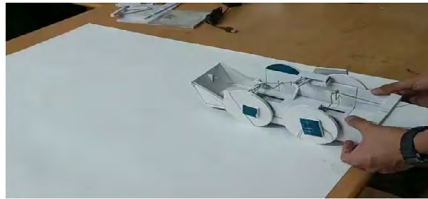
**Toy Features**

- Pull toy
- Triggers light when pulled
- Mouth snaps
- Flapping fins
- Waving tail

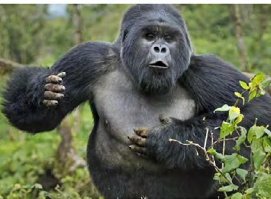
**Angler Fish Mechanism**



**Angler Fish Mechanism**



**Gorilla**



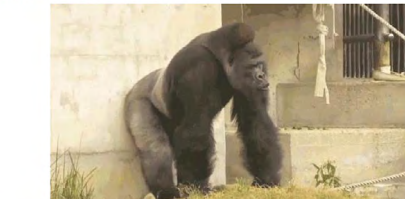
**Unique Features**

- Tapping sound
- Walking

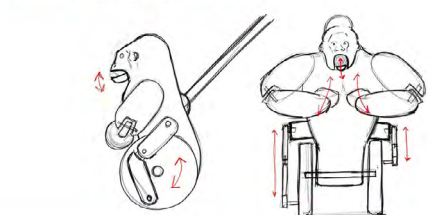
**Toy Features**

- Push toy
- Beating on chest
- Mouth movements
- Leg movements

**Gorilla Movement**



**Gorilla Movement Sketches**



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6Aoi. Stage 1 Presentation

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6B. Ride-on Toy - Group B

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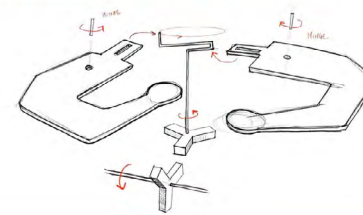
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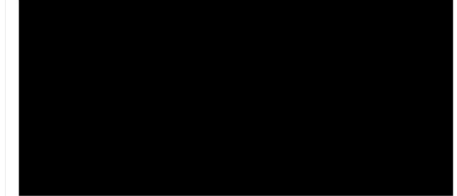
Arm movement



Arm movement alternate mechanism



Leg and arm mechanism



Arm movement



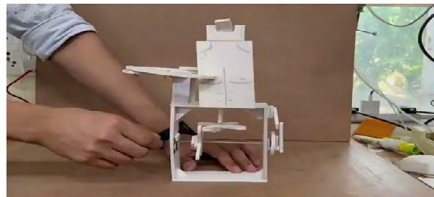
Gorilla movement



Alternate mechanism



Gorilla movement



End of slides



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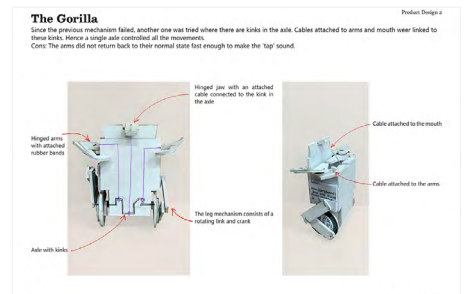
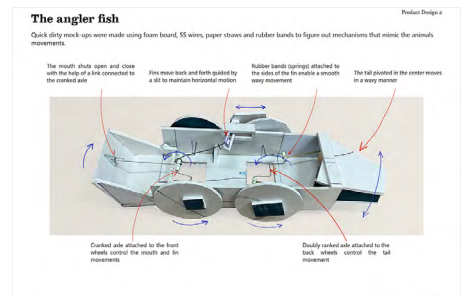
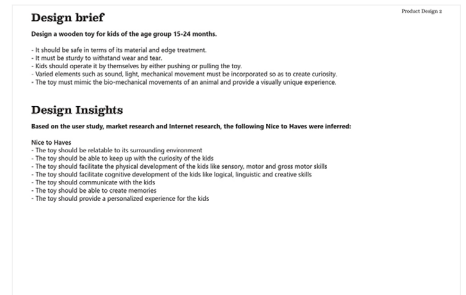
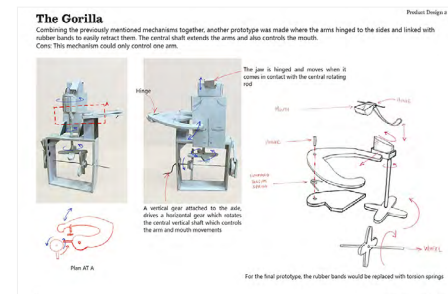
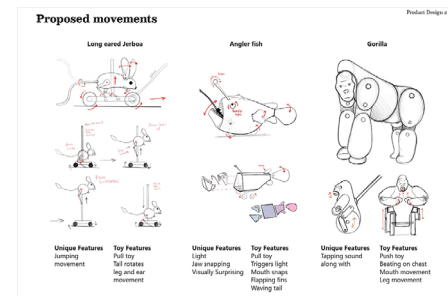
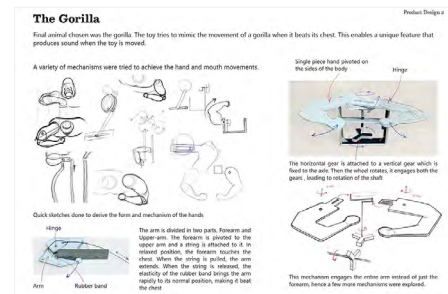
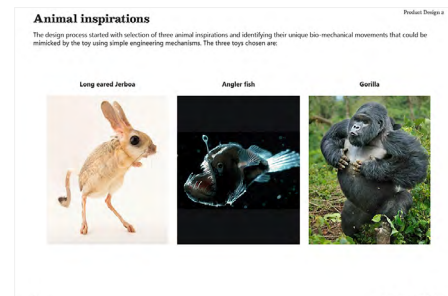
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## Case Study - Slide Show

Case Study Download:

• [Go Bananas\\_by Parth Rathod\\_Report.....](#)



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6B. Ride-on Toy - Group B

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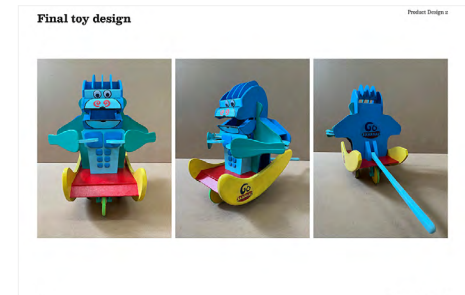
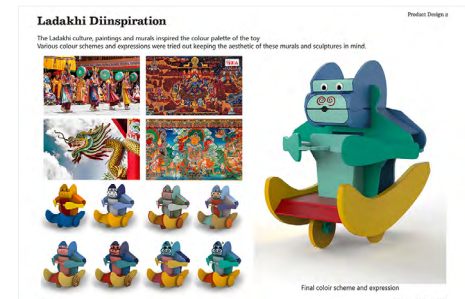
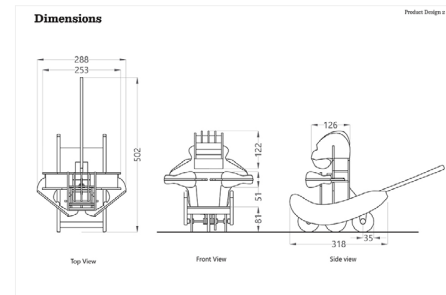
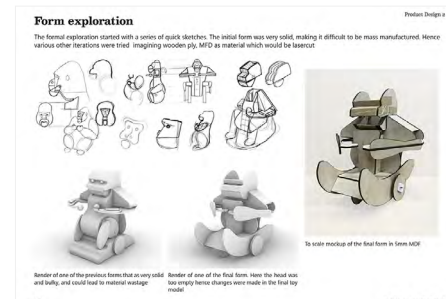
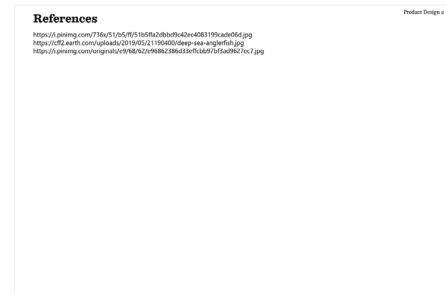
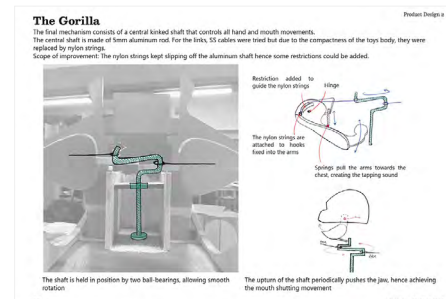
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## Poster



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## Video

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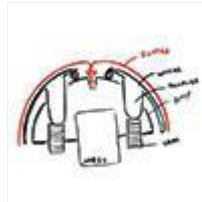
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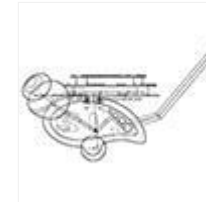
10. Contact Details

## Buba by Prathmesh Pedamkar

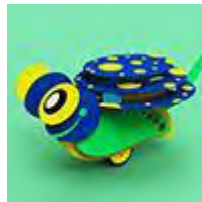
The aim of the project is to design a wooden push/pull toy for kids, aged 9 to 24 months, by taking bionic inspiration, which is easy to manufacture.



Stage 1 Presentation



Case Study - Slide Show



Poster

Design Course

# Indian Toy Design

Biomimicry-inspired toys

by

Prof. Vijay Bapat

IDC, IIT Bombay

Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/buba-prathmesh-pedamkar/stage-1>

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah, 6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An

6Ao

6Ap. Buba by Prathmesh Pedamkar

6Api. Stage 1 Presentation

6Apii. Case Study - Slide Show

6Apiii. Poster

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

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## Stage 1 Presentation

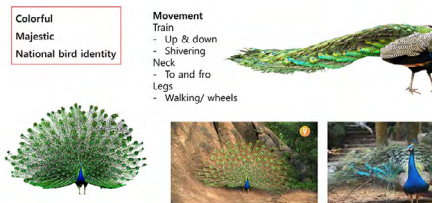
Download:

• [Buba\\_Stage 1 Presentation\\_by Prathmesh Pedamkar.....](#)

### Must Haves

1. Roundness (no sharp edges)
2. Sound feedback
3. Less components (to avoid wear and tear, and failure)
4. Visually appealing and inviting

### Peacock



### The Brief

Design a wooden push/pull toy for kids, aged 9 to 24 months, by taking bionic inspiration.

### May Haves

1. The child should be able to play or fidget without pulling or pushing
2. Facilitate physical development
3. Open ended
4. Personal experience

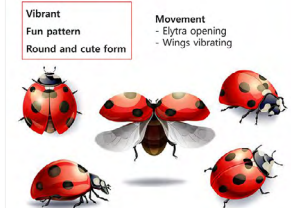
### Rabbit



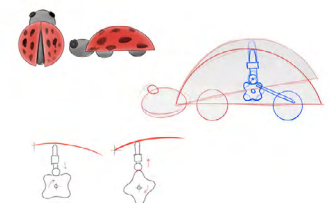
### User Insights

1. Kid gets curious after seeing the toy and try to figure out what to do with it. Play? Throw? Give to somebody?
2. Usually they use one toy for about 6 months
3. Prefer less complex looking toys

### Lady Bug



### Mechanism



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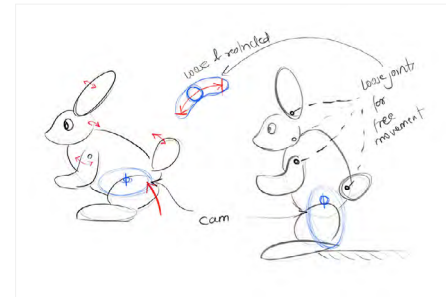
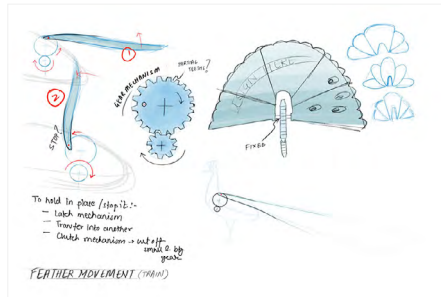
6B. Ride-on Toy - Group B

7. Toys

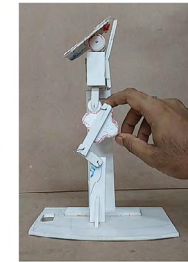
8. Links

9. Video

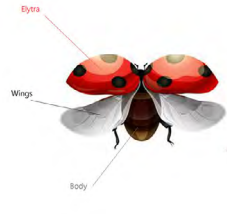
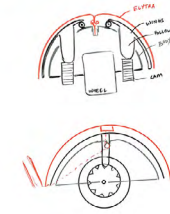
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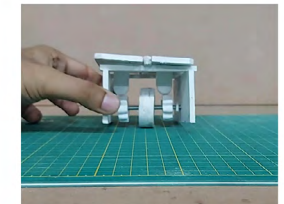
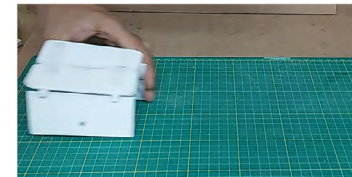
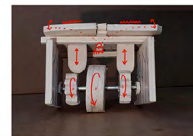
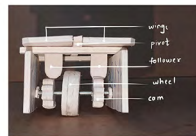
## Mechanism Mock-up



## Details



## Mock-up 2



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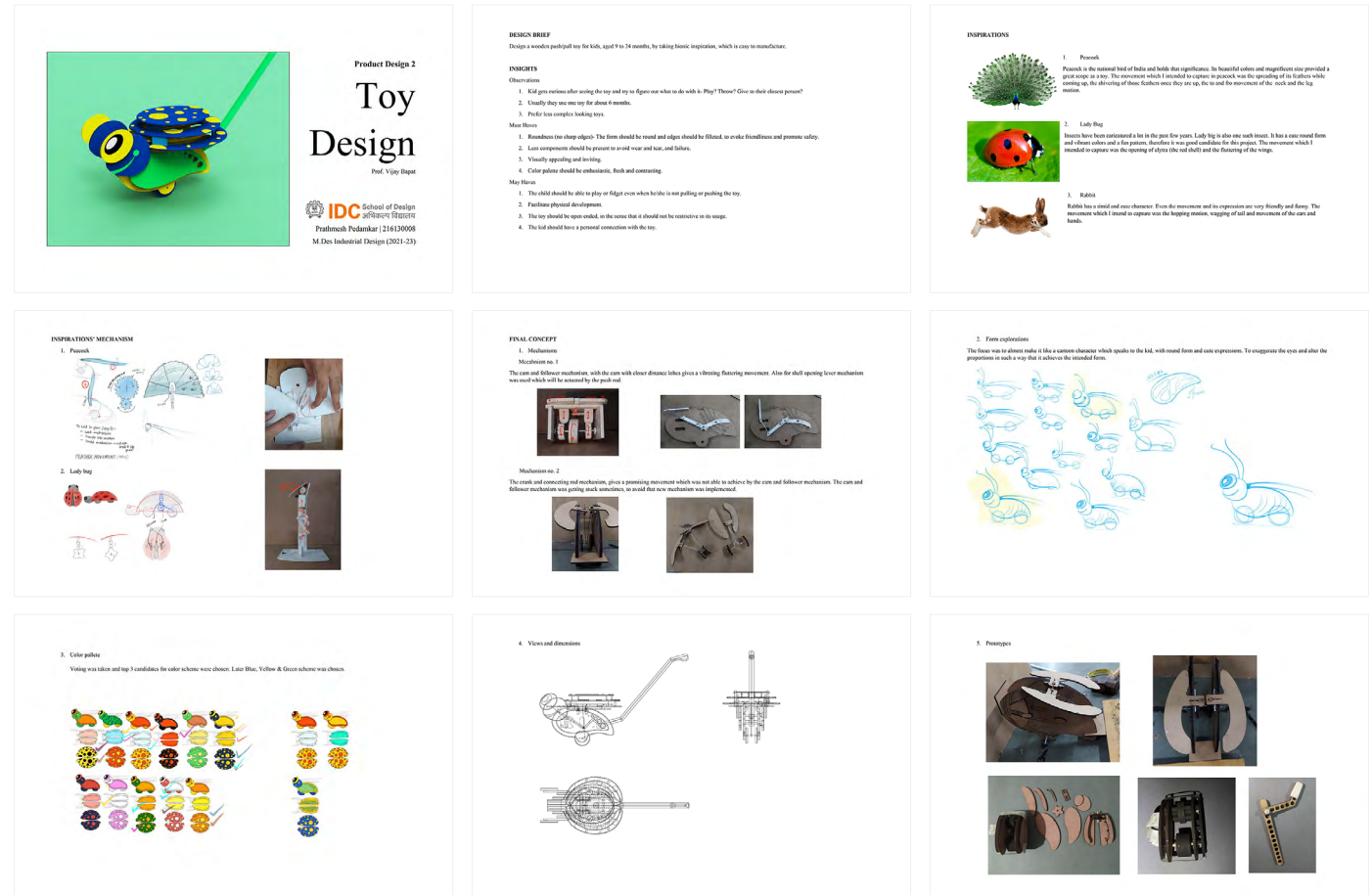
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## Case Study - Slide Show

Case Study Download:

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6Ao

6Ap. Buba by Prathmesh Pedamkar

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6Apii. Case Study - Slide Show

6Apiii. Poster

6Aq, 6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

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## Indian Toy Design

Biomimicry-inspired toys

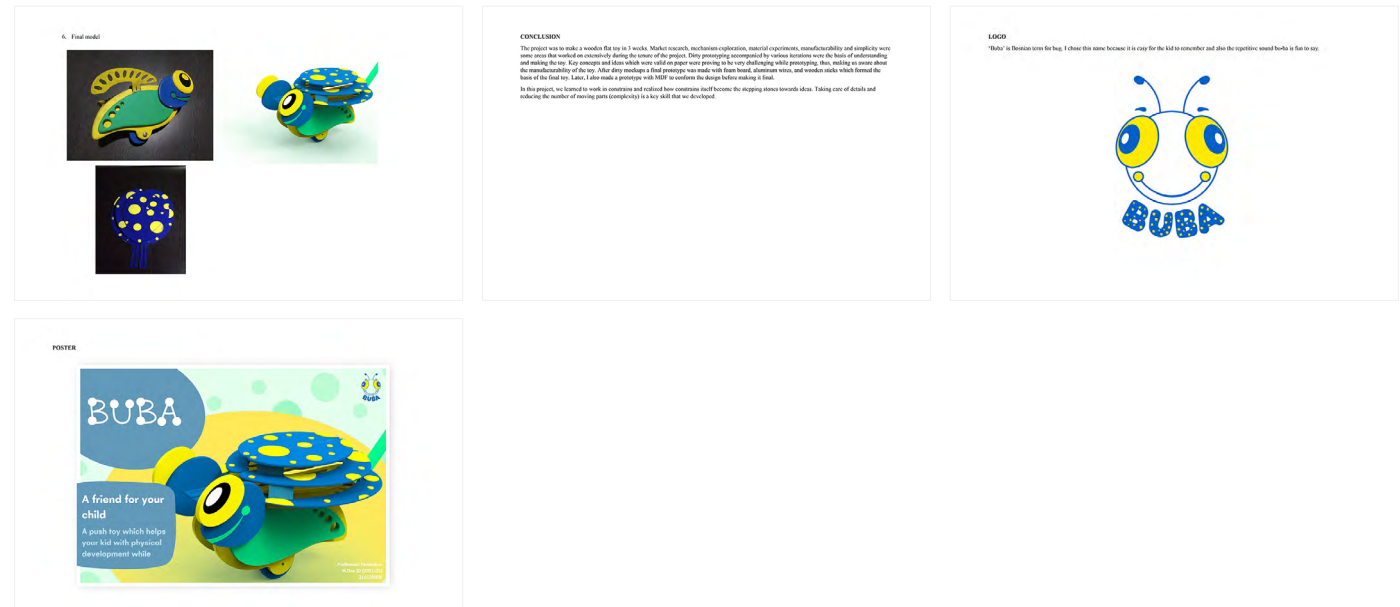
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6B. Ride-on Toy - Group B

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## Poster



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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah, 6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An

6Ao, 6Ap

6Aq. Pambo by Sagar D Dabherao

6Aqi. Stage 1 Presentation

6Aqii. Case Study - Slide Show

6Aqiii. Poster

6Aqiv. Video

6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

10. Contact Details

## Pambo by Sagar D Dabherao

The aim of the project is to design an animal-inspired push/pull toy for the age group of 15-24 months.

### Constraints

1. The primary material of the toy should be wood.
2. Other materials can be used in very minimal quantity for specific purpose.
3. Toy should be inspired form nature.
4. It should be safe for kids – form, material, size of parts, etc.
5. It should be easy to operate and visually approachable.
6. It should be able to withstand wear and tear.

### Environment of use

1. Interior of the house – floor space or play area of the kid.
2. It may be used by the kids when they are either standing, walking or sitting.



Stage 1 Presentation



Case Study - Slide Show



Poster



Video

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6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah, 6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An

6Ao, 6Ap

6Aq. Pambo by Sagar D Dabherao

6Aqi. Stage 1 Presentation

6Aqii. Case Study - Slide Show

6Aqiii. Poster

6Aqiv. Video

6Ar, 6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

7. Toys

8. Links

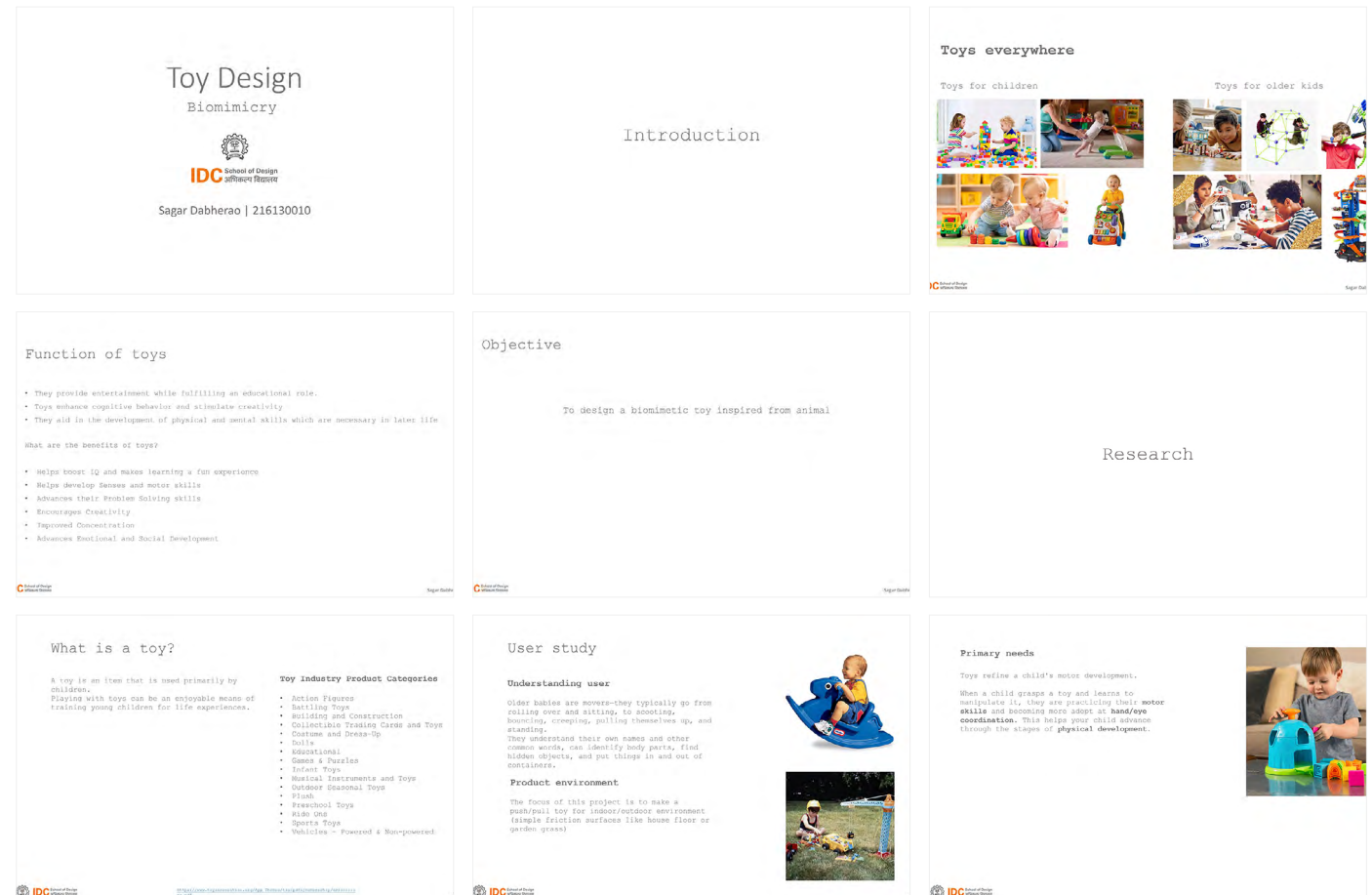
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6Ao, 6Ap

6Aq. Pambo by Sagar D Dabherao

6Aqi. Stage 1 Presentation

6Aqii. Case Study - Slide Show

6Aqiii. Poster

6Aqiv. Video

6Ar, 6As, 6At, 6Au, 6Av

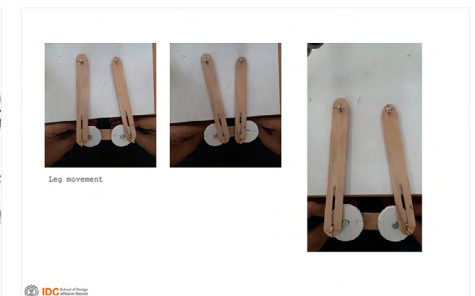
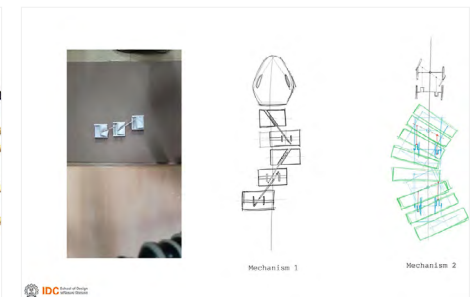
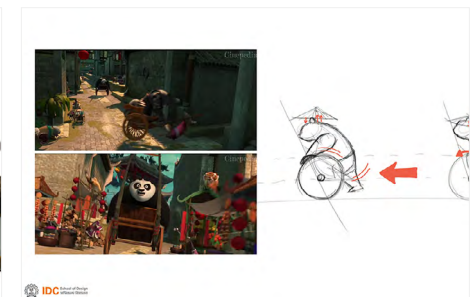
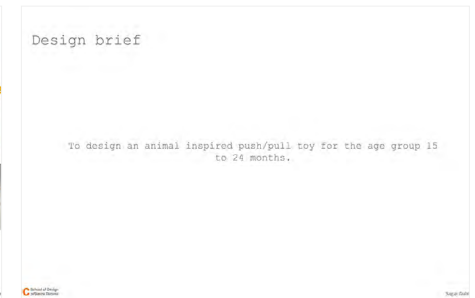
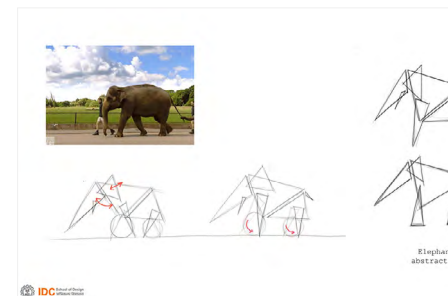
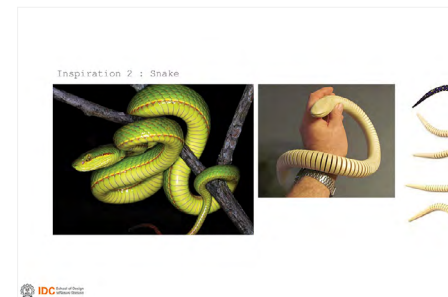
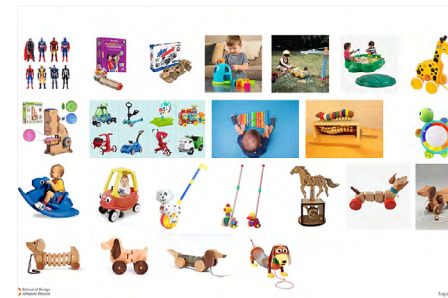
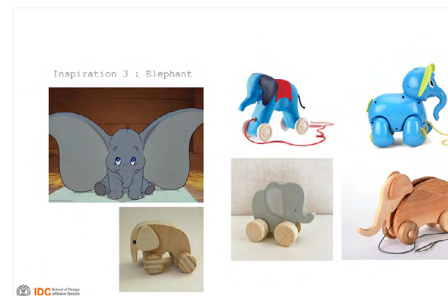
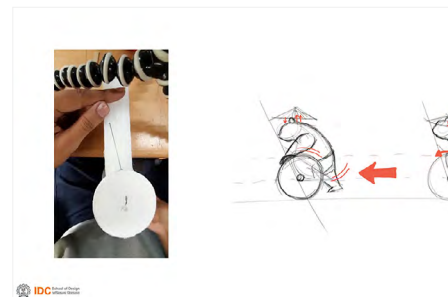
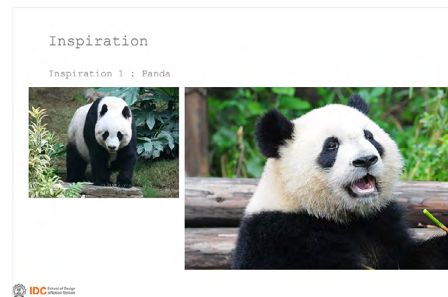
6B. Ride-on Toy - Group B

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6Ao, 6Ap

## 6Aq. Pambo by Sagar D Dabherao

6Aqi. Stage 1 Presentation

6Aqii. Case Study - Slide Show

6Aqiii. Poster

6Aqiv. Video

6Ar, 6As, 6At, 6Au, 6Av

## 6B. Ride-on Toy - Group B

7. Toys

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## Case Study - Slide Show

Case Study Download:

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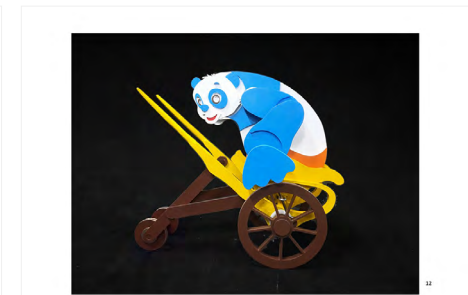
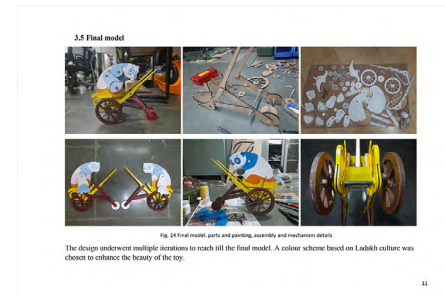
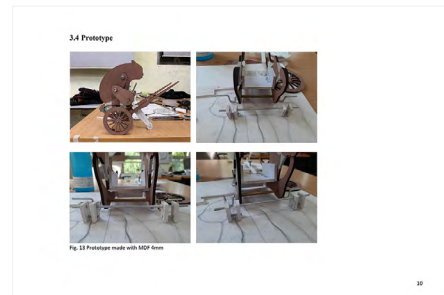
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## Poster



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6Aqiv. Video

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## Video

Pambo by Sagar D Dabherao

YouTube Video Link.....

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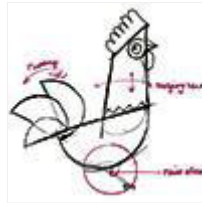
8. Links

9. Video

10. Contact Details

## Muro by Shivani M

Toys are an integral part of childhood. It not only develops the emotive value but also helps in the cognitive development of the child. A toy serves many purposes other than Entertainment. The colour schemes, mechanism and movements of the object define the mood and emotions of the child.



Stage 1 Presentation



Case Study - Slide Show



Poster

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6As, 6At, 6Au, 6Av

6B. Ride-on Toy - Group B

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User Study : User Interviews

User 01

1. Age / Gender	: 19 Months / Male
2. Cognition Development	
1. Sensory motor skills	: Walk
2. Reflex and adaptation	: Sound responses
3. Types of toys	: Mechanical
4. What is the favourite toy?	: Sound Box
5. Any specific brand/ market place?	: Fisher price / First Cry
6. What form of toys?	: Block, basic forms & Shapes
7. Material preferred by parents	: No preference
8. Price range most likely to buy	: 500 - 2000 INR
9. Playing Environment	: Indoors



User Study : User Interviews

User 02


1. Age / Gender	: 23 Months / Female
2. Cognition Development	
1. Sensory motor skills	: Walk
2. Reflex and adaptation	: Sound, talk & Visual response
3. Types of toys	: Mechanical / Soft
4. What is the favourite toy?	: Tricycle
5. Any specific brand/ market place?	: None
6. What form of toys?	: Motion & mobility, soft toys
7. Material preferred by parents	: No preference
8. Price range most likely to buy	: 500 - 5000 INR
9. Playing Environment	: Indoors & Outdoors



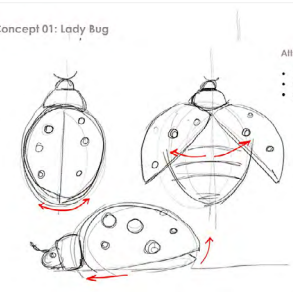
User Study synthesis :

<p><b>Must have</b></p> <ul style="list-style-type: none"> <li>• Push / pull along toy</li> <li>• Bio mimicking mechanism</li> <li>• Robust</li> <li>• Material: wood</li> <li>• Attractive colour scheme</li> <li>• Factor of safety: No pointed Elements</li> <li>• Soft edges, soft Characteristics</li> </ul>	<p><b>May have</b></p> <ul style="list-style-type: none"> <li>• Creates sound</li> <li>• Fusion of materials</li> <li>• Comical features</li> <li>• Educational</li> <li>• Mobility - Tricycle or walker</li> <li>• Suitable for Indoor &amp; Outdoor environment</li> </ul>
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Concept Development




Concept 01: Lady Bug

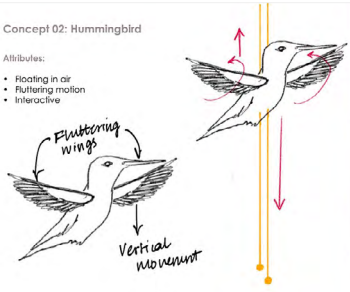


Attributes:

- Vibrance
- Fluttering motion
- Envelope




Concept 02: Hummingbird

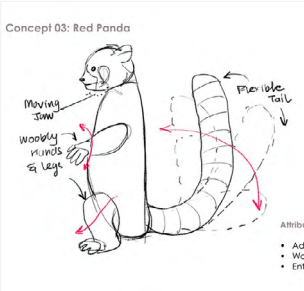


Attributes:

- Floating in air
- Fluttering motion
- Interactive


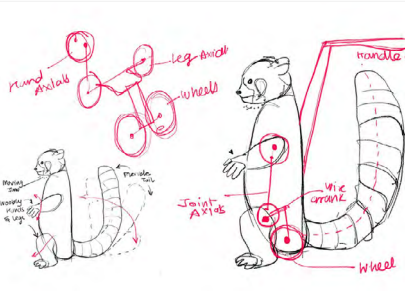


Concept 03: Red Panda



Attributes:

- Adorable
- Wobbling motion
- Enthusiasm

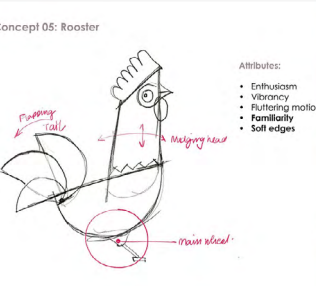
Concept 03: Red Panda 3D mockup



Concept 03: Red Panda 3D mockup




Concept 05: Rooster

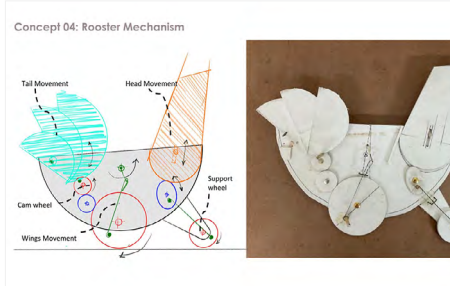


Attributes:

- Enthusiasm
- Vibrancy
- Fluttering motion
- Familiarity
- Soft edges



Concept 04: Rooster Mechanism



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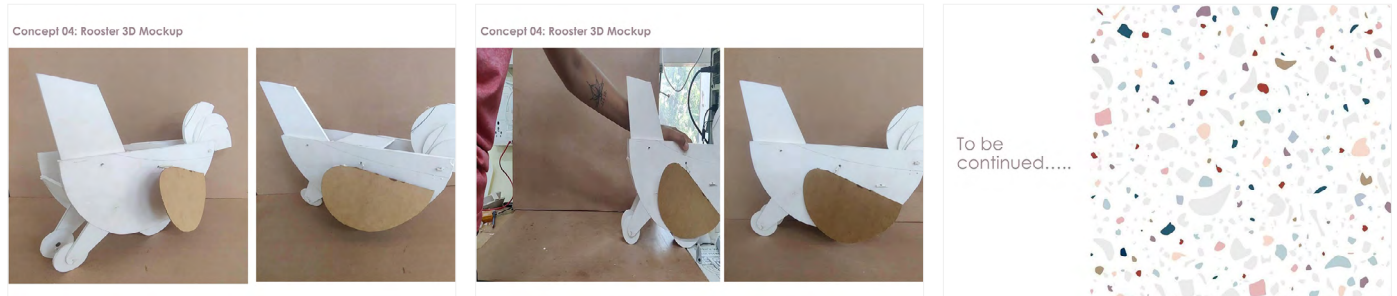
## Indian Toy Design

Biomimicry-inspired toys

by

Prof. Vijay Bapat

IDC, IIT Bombay



Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/muro-shivani-m/stage-1-presentation>

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6Ari. Stage 1 Presentation

6Arii. Case Study - Slide Show

6Ariii. Poster

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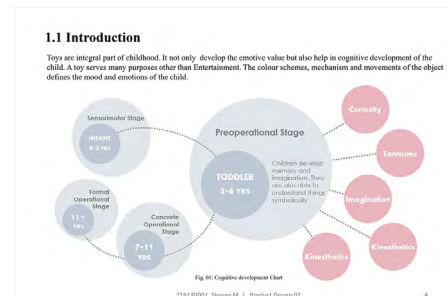
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Source:

<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/muro-shivani-m/case-study-slide-show>

## Case Study - Slide Show

Case Study Download:

• Muro\_by Shivani M.....

**1.3.1 User Study : User Interviews**

**User 01**

1. Age / Gender	: 19 Months / Male
2. Cognition Development	
1. Sensory motor skills Level	: Walk
2. Reflex and adaptation	: Sound responses
3. Types of toys	: Mechanical
4. What is the favourite toy?	: Sound Box
5. Any specific brand/ market place?	: Fisher price / First Cry
6. What form of toys?	: Block, basic forms & Shapes
7. Material preferred by parents	: No preference
8. Price range most likely to buy	: 500 – 2000 INR

**Design Brief**

**AIM** : To design a wooden toy for kids of 15-24 months.

**OBJECTIVE** :

- Biomimicry : Inspired from nature
- Must have mechanism & movement
- Push or Pull toy.
- Toy should be robust to withstand indoors and outdoors playground.
- The toy should be able withstand wear and tear by a toddler.



**1.3.2 User Study : User Interviews**

**User 02**

1. Age / Gender	: 23 Months / Female
2. Cognition Development	
1. Sensory motor skills	: Walk
2. Reflex and adaptation	: Sound, talk & Visual response
3. Types of toys	: Mechanical / Soft
4. What is the favourite toy?	: Tricycle
5. Any specific brand/ market place?	: None
6. What form of toys?	: Motion & mobility soft toys
7. Material preferred by parents	: No preference
8. Price range most likely to buy	: 500- 5000 INR

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  - 1.2. Market study
  - 1.3. User Study
    - 1.3.1. Analysis
2. Design Inspiration
3. Iteration
4. Colour Palette
  - 4.2. 2D Visualization
  - 4.3. 3D Visualization
  - 4.4. The process of making
5. Final Model
  - 5.2. Branding
6. Learnings

**1.3 User Study : User Interviews**

**User Questionnaire :**

1. Age / Gender
2. Cognition Development
  1. Sensory motor skills
  2. Reflex and adaptation
3. Types of toys
4. What is the favourite toy?
5. Any specific brand/ market place?
6. What form of toys?
7. Material preferred by parents
8. Price range most likely to buy

**1.3.3 User Study synthesis :**

<p><b>Must have</b></p> <ul style="list-style-type: none"> <li>• Push / pull along toy</li> <li>• Bio mimicking mechanism</li> <li>• Robust</li> <li>• Material: wood</li> <li>• Attractive colour scheme</li> <li>• Factor of safety: No pointed Elements</li> <li>• Soft edges, soft Characteristics</li> </ul>	<p><b>May have</b></p> <ul style="list-style-type: none"> <li>• Creates sound</li> <li>• Fusion of materials</li> <li>• Comical features</li> <li>• Educational</li> <li>• Mobility – Tricycle or walker</li> </ul>
---	---

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

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## 6B. Ride-on Toy - Group B

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### 2.1 Design Inspiration



Biomimicking the animals and their movements in the form of wooden toys. Taking inspiration from nature gives an opportunity to appreciate nature, form and visual harmony.

216130002\_Shivani M | Product Design 02

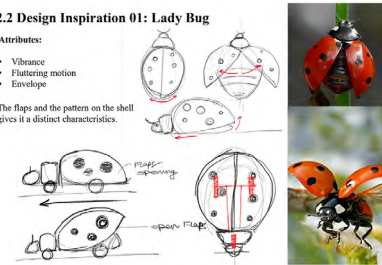
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### 2.2 Design Inspiration 01: Lady Bug

Attributes:

- Vibrance
- Fluttering motion
- Envelope

The flaps and the pattern on the shell gives it a distinct characteristics.



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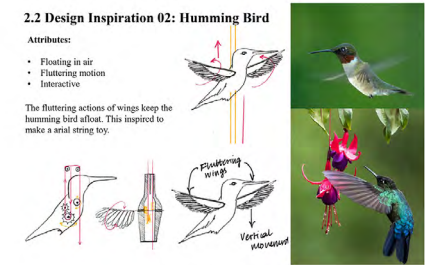
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### 2.2 Design Inspiration 02: Humming Bird

Attributes:

- Fluttering in air
- Fluttering motion
- Interactive

The fluttering actions of wings keep the humming bird aloft. This inspired to make a small string toy.



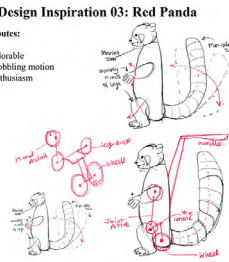
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### 2.3 Design Inspiration 03: Red Panda

Attributes:

- Adorable
- Wobbling motion
- Enthusiasm



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### 2.3 Design Inspiration 03: Red Panda



Dirty Mock up

Trying out the basic mechanism to mimic the wobbling hand movements of the panda.

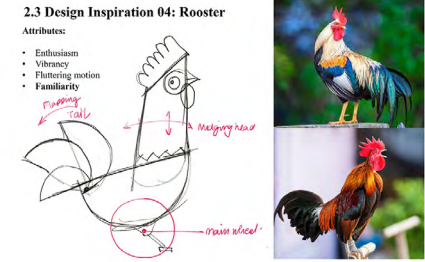
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### 2.3 Design Inspiration 04: Rooster

Attributes:

- Enthusiasm
- Vibrancy
- Fluttering motion
- Familiarity



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### 2.3 Design Inspiration 04: Rooster

Dirty Mock up

Trying out the basic mechanism to mimic the Nodding head & Flapping wings movements of the Rooster.



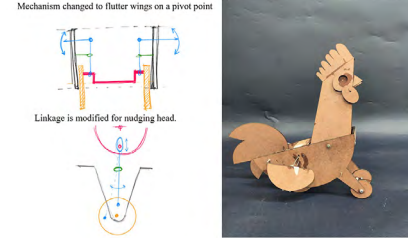
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### 3.1 Iteration 01

Mechanism changed to flutter wings on a pivot point

Linkage is modified for nodding head.

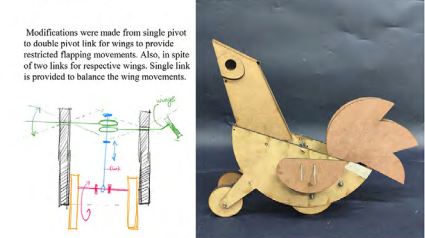


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### 3.1 Iteration 02

Modifications were made from single pivot to double pivot link for wings to provide restricted flapping movements. Also, in spite of two links for respective wings. Single link is provided to balance the wing movements.

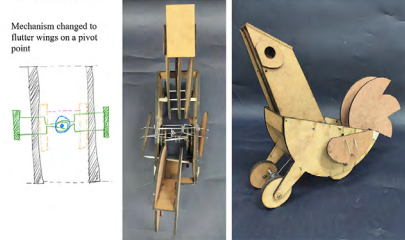


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### 3.1 Iteration 02

Mechanism changed to flutter wings on a pivot point



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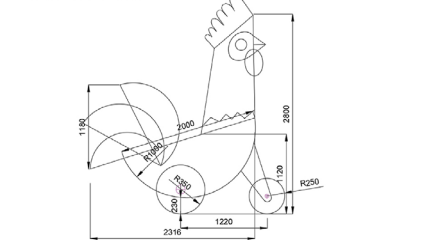
### 4.1 Colour Scheme : Ladkh palette



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### 4.2 2D Visualization



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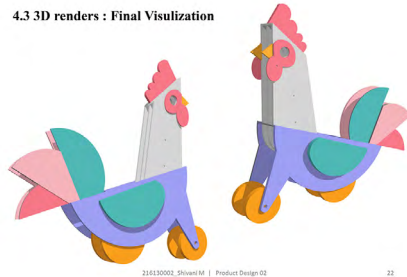
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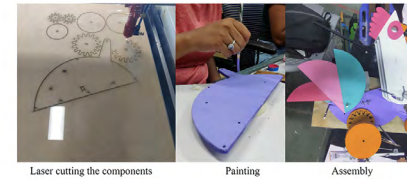
## 4.3 3D renders : Final Visualization



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## 4.4 The process of making



Laser cutting the components

Painting

Assembly

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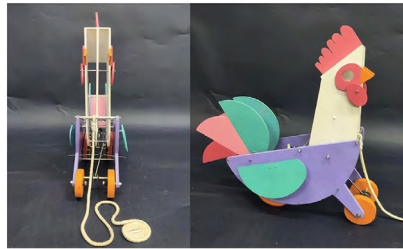
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## 5.0 Final Model Pictures



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## 5.2 Branding.

The toy is named MURO i.e. Murga + Rooster. The name is simplified for a toddler to speak.



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## 4.5 Learnings.

The four week long course provided insights of the toy ,its functional and aesthetic significance. Starting from observation, analysing and developing a mechanism mimicking the actions is a wholesome process. Working on this project gave us a great insight on how a product goes through series of filtrations based on the user, materials, manufacturing and other constraints. The project helped us get sensitive towards the details. The material handling, manufacturing process and building up the marketable product were some practical aspects which were explored through this course.

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## Poster



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## Cunth by Snehal Gaikwad

Children of the age group of 15-24 months have just learned to walk and constantly try to explore the world and seek adventure. They can differentiate shapes, colour textures, sounds etc. Round shapes, bright colours, unique textures and sounds catch their attention. In Indian culture, children are being fed by stories from Panchatantra, Isapniti, etc, so they develop a fascination with different animals. To secure the child's mental and physical development, the curious mind of children needs to be constantly fed by new experiences.

What children of this age group love to do?

- Explore material in many creative ways
- Make discoveries for themselves
- Play out imaginative scenarios from their daily lives



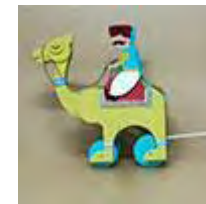
Stage 1 Presentation



Case Study - Slide Show



Poster



Video

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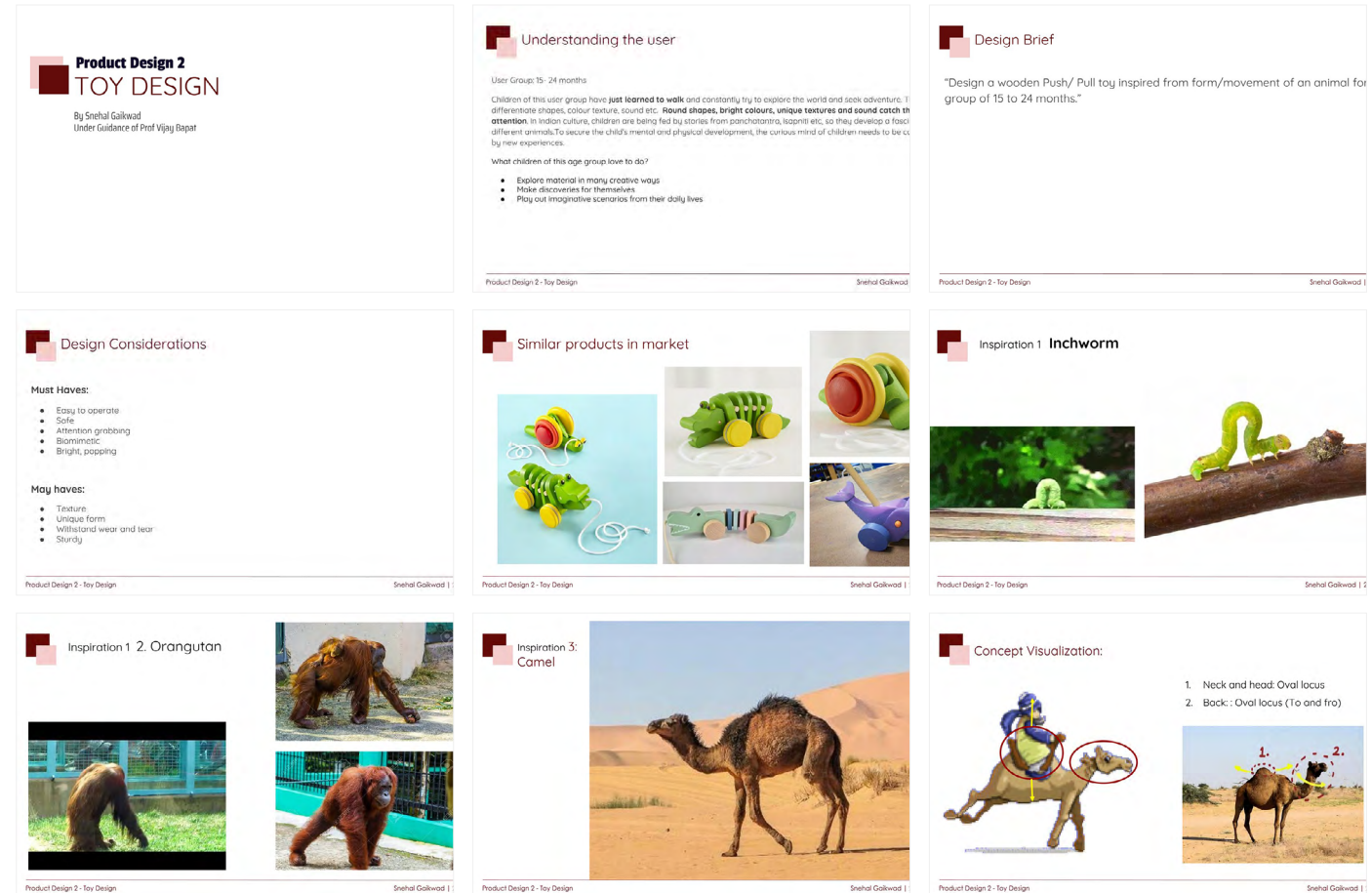
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## Stage 1 Presentation

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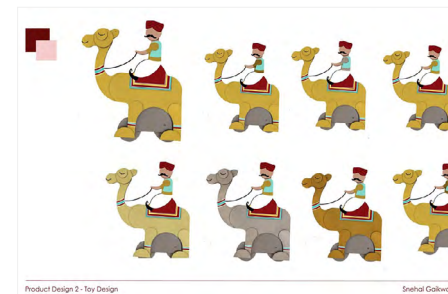
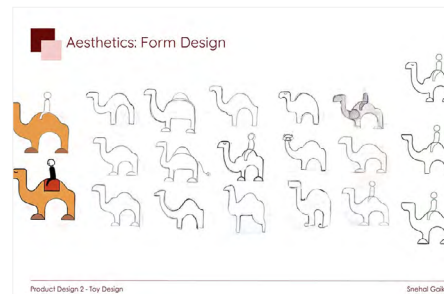
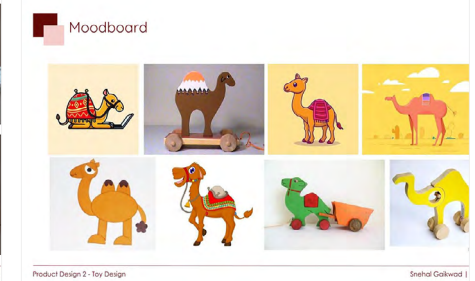
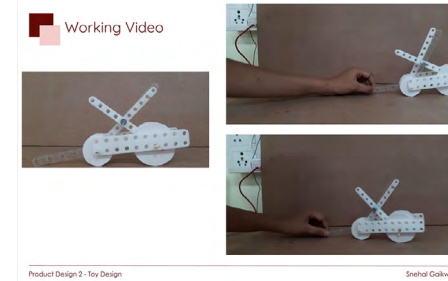
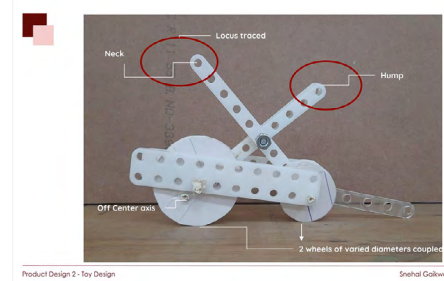
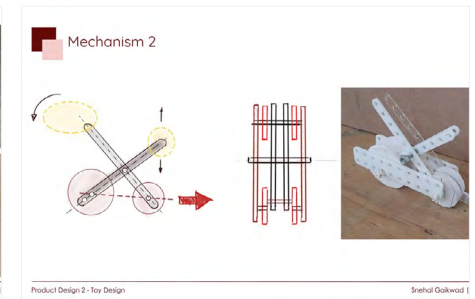
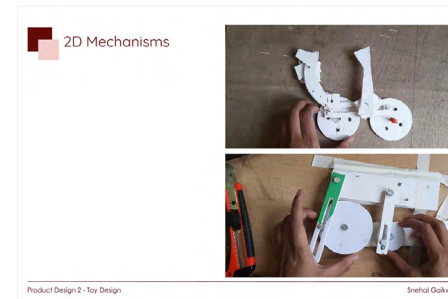
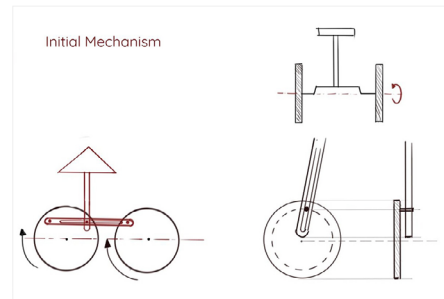
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## Case Study - Slide Show

Case Study Download:

• **Cunth\_by Snehal Gaikwad.....** 



Design Brief	Design considerations
<p>"Design a wooden Push/ Pull toy inspired from form/movement of an animal for age group of 15 to 24 months."</p>	<p><b>Must Haves:</b></p> <ul style="list-style-type: none"> <li>• Easy to operate</li> <li>• Safe</li> <li>• Attention grabbing</li> <li>• Biomorphic</li> <li>• Bright, popping</li> <li>• Imitativeness</li> </ul> <p><b>May haves:</b></p> <ul style="list-style-type: none"> <li>• Texture</li> <li>• Unique form</li> <li>• Withstand wear and tear</li> <li>• Sturdy</li> </ul>

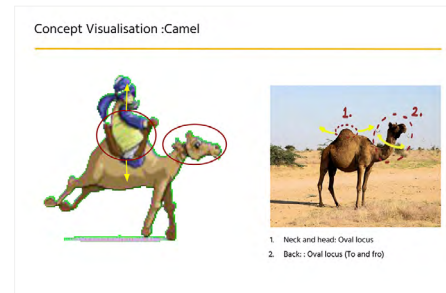
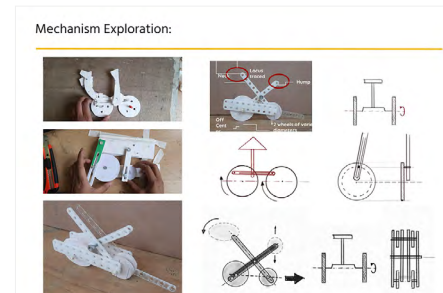


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6. Aesthetic Form Design
7. Colour Palette
8. Colour Variations
9. Final Concept
10. Logo
11. Poster

Market Study:

Researched on different wooden push pull toys and their mechanisms and sizes and how the incorporate biomechanics in their design



Introduction

User Group: 15- 24 months

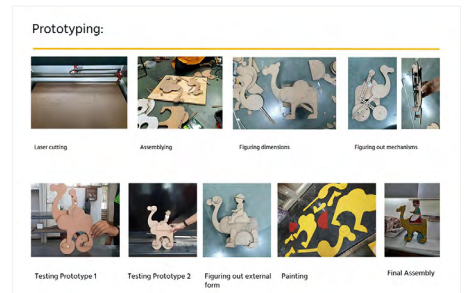
Children of this user group have **just learned to walk** and constantly try to explore the world and seek adventure. They can differentiate shapes, colour texture, sound etc. **Round shapes, bright colours, unique textures and sound catch their attention.** In Indian culture, children are being fed by stories from panchatantra, saguna etc, so they develop a fascination with different animals to secure the child's mental and physical development, the curious mind of children needs to be constantly fed by new experiences.

What children of this age group love to do?

- Explore material in many creative ways
- Make discoveries for themselves
- Play out imaginative scenarios from their daily lives

Inspiration

Camel	Inchworm	Orangutan
<p>Camel has a unique head movement with head swaying in horizontal oval locus while his hump moves in a vertical oval locus. The person sitting on his back moves up and down while swaying</p>	<p>Inchworm is a worm with multiple legs which contracts and expands itself to move from one place to other. His back makes a scissor into a circle to move from one place to other</p>	<p>Orangutan is from an ape family with his hands extraordinary longer than his legs which rests on ground while standing. While walking his swings from left to right which gives a poetic effect to his movement</p>



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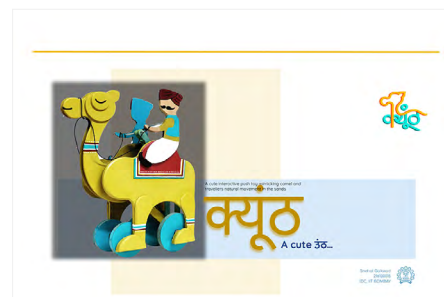
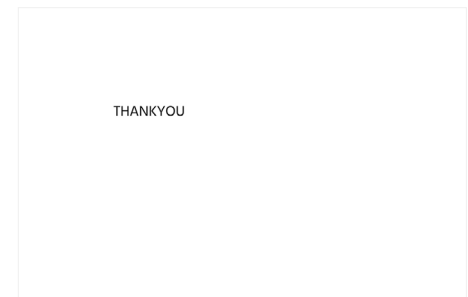
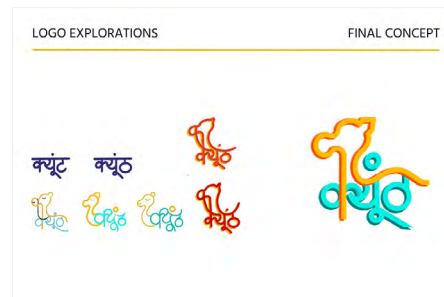
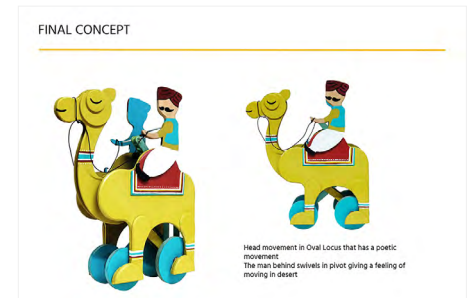
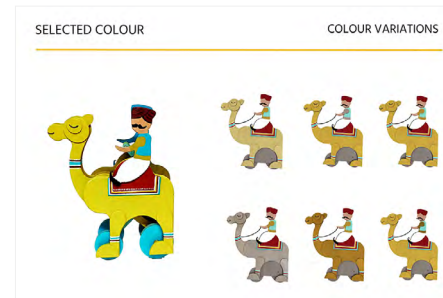
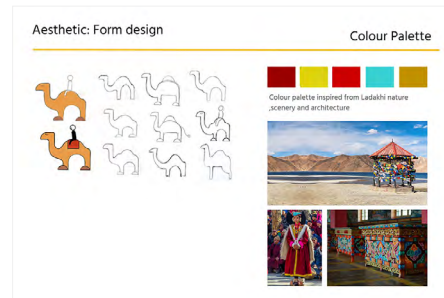
6B. Ride-on Toy - Group B

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1, 2, 3, 4, 5, 6

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6As. Cunth by Snehal Gaikwad

6Asi. Stage 1 Presentation

6Asii. Case Study - Slide Show

6Asiii. Poster

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7. Toys

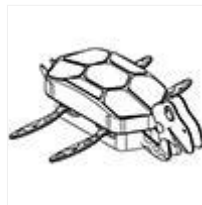
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## Taco by Susovan Gupta

This project was done under Prof Vijay Bapat as a semester course named Product Design 2 where we had to design a toy for toddlers of the age from 15 months to 24 months. The inspiration for the toy has to come from an animal of our surroundings and a sense of biomimicry has to be given in order to study and appreciate the amazing natural creation by God. We, in search of God, found in details as our sir helped us to see. In this exercise, we had to come up with 3 ideas and then select one to go forward with. Had to develop dirty mock-ups to come up with simpler mechanism options.



Case Study - Slide Show



Poster



Video

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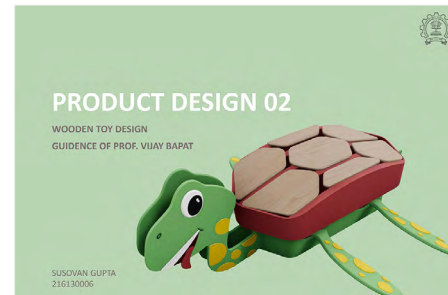
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## Case Study - Slide Show

Case Study Download:

• **Taco by Susovan Gupta.....** 



### DESIGN INSIGHTS

#### Design Brief

To design and develop a wooden toy for children in the age group of 9-24 months inspired from a selected animal and biomimicking its actions to make it more playful and learning experience for the children.

#### Objective

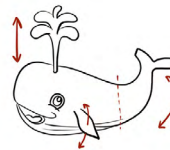
- The toy should communicate with children.
- It should be reusable and generate curiosity in them.
- It should be easy to operate by push/pull mechanism.
- The mechanisms should be inside the body, to make it user friendly.
- Should help children to develop motor skills.

#### User environment

- Any indoor floor surface.
- Can be used by kids by running, walking or even crawling.
- Can be played by pulling or pushing the toy
- Can be played together.

### THREE INSPIRATIONS

#### Whale



### DESIGN INSIGHTS

#### Must haves

- Toy should be push/pull mechanism.
- Toy material has to be mild.
- Mechanism should be easy to use and safe for children.
- It should be robust.

#### May haves

- Toy can create a personal and emotional bonding with the child.
- Toy should contribute in the physical and mental growth of the child.
- Toy should have cartoonish features and is colorful.

#### User experience

- Toy should be self-explanatory for children. Without needing help they should be able to play.
- It should instill curiosity and creativity in them.
- Children should not be bored to play with it.
- Should train and understand the animal.

#### Sea Turtle



Both the legs will either walk or swim and they will work in diagonally sync. The shell may be used as musical toy.

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Design insights  
Three inspirations  
Final selection- Sea turtle  
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Mock up of final mechanism  
Shell ideation and detailing  
Form variations  
Colour palette  
Colour variation  
Final toy design  
Technical drawing  
Final Model  
Logo  
Poster  
Conclusion

### INTRODUCTION

This project is done under Prof Vijay Bapat sir as a semester course named Product Design 2 where we had to design a toy for toddlers of the age from 15 months to 24 months. The inspiration for the toy has to come from an animal of our surroundings and a sense of biomimicry has to be given in order to study and appreciate the amazing natural creation by God. We, in search of God found in details as our air helped us to see. In this exercise we had to come up with 3 ideas and then select one to go forward with. Had to develop dirty mock ups to come up with simpler mechanism options.

### DESIGN INSIGHTS

#### Specifications

- Primary material- Mdf
- Secondary materials- sunboard, aluminum rods, other joinery
- Colour palette- inspired by Ladakh research done during forms 2 module.

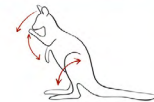
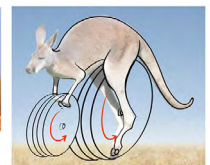
#### Maintenance

- Toy should be robust and easy to join.
- It should be easy to just wipe clean.

#### USP

- Wooden toy handcrafted.
- Musical instrument to learn.
- Xylophone and pan drum inspired.
- Ingenious in nature and innovative in approach.

#### Kangaroo



Rotating wheel will rotate both legs creating a jumping movement.

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah, 6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An

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6B. Ride-on Toy - Group B

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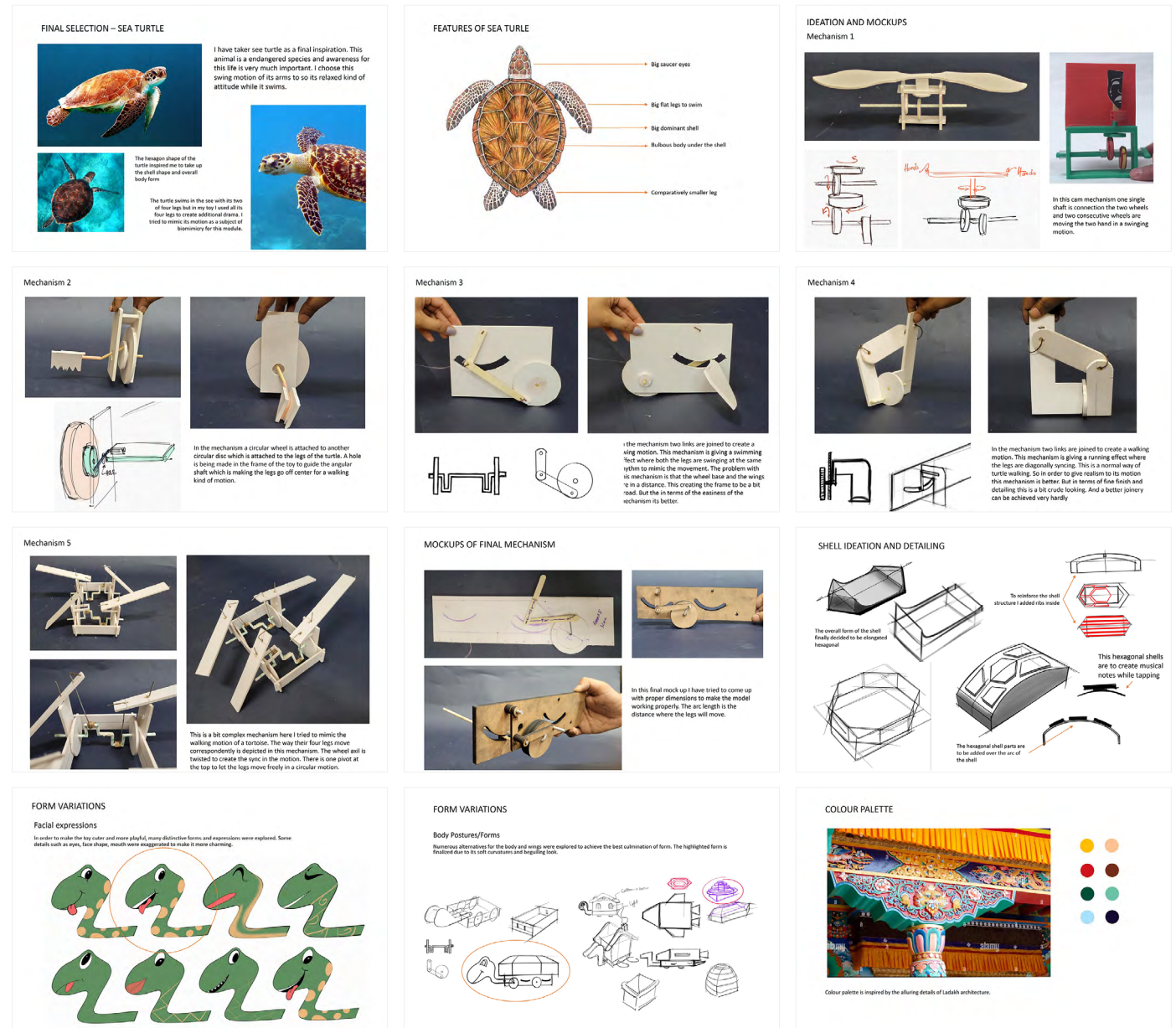
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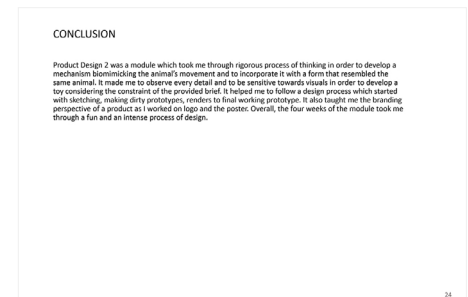
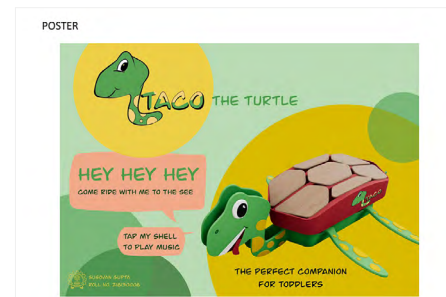
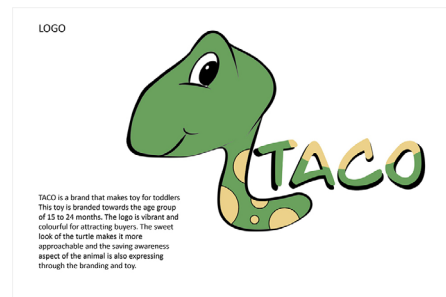
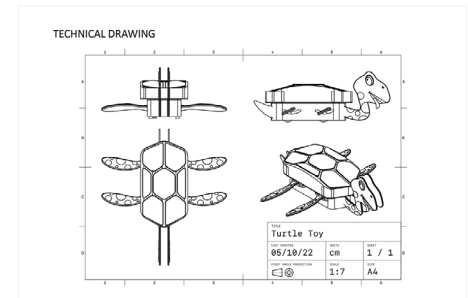
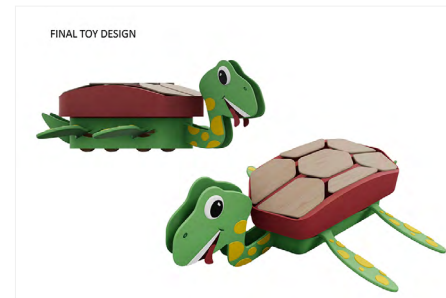
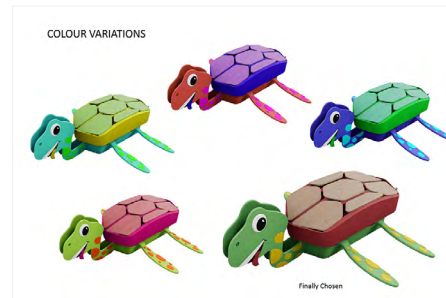
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### Poster



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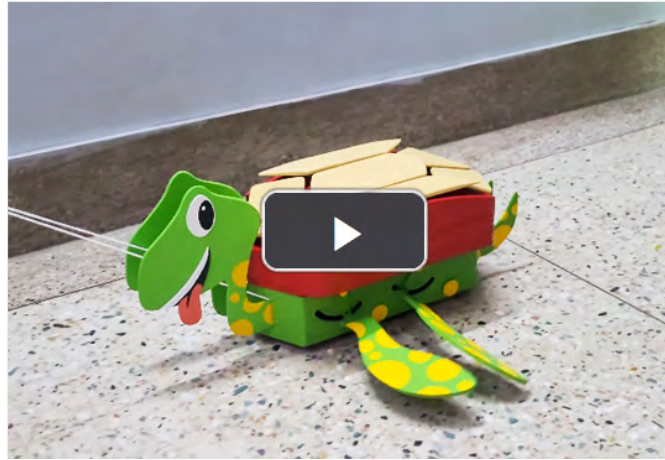
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6Au. Hooti by Uppili Nithin Soorya B

6Aui. Stage 1 Presentation

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6B. Ride-on Toy - Group B

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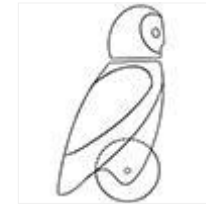
Design a wooden toy for kids of the age group 9-24 months

### Constraints

- Material of the toy should be wood.
- It should be a Push or pull toy.
- The toy should mimic the biomechanical movements.
- It should have attractive colors.



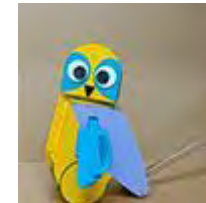
Stage 1 Presentation



Case Study - Slide Show



Poster



Video



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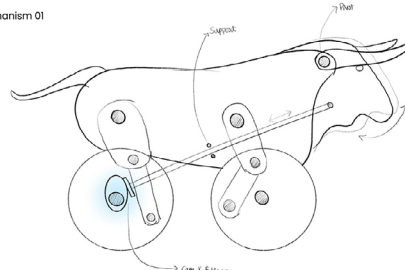
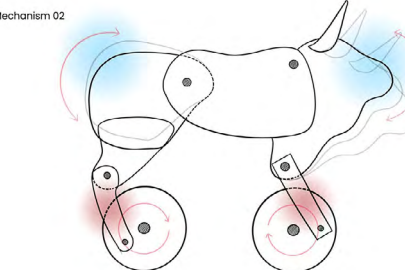


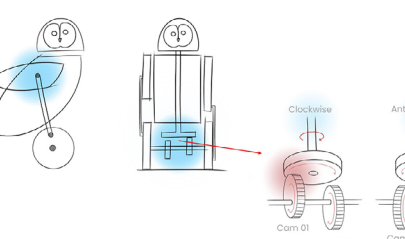
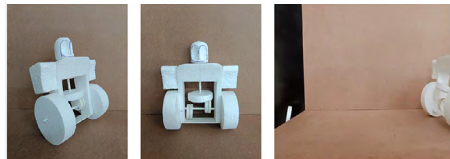
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## Stage 1 Presentation

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<p><b>Product Design 2</b></p> <p><b>TOY DESIGN</b></p> <p>Biomimicry</p> <p>Uppili Nithin Soorya B 216130016</p>	<p><b>Animal Inspirations</b></p> <div>  <p><b>BULL</b></p> </div> <div>  <p><b>OWL</b></p> </div>	<p><b>BULL</b></p> <ul style="list-style-type: none"> <li>• Charging</li> <li>• Aggression</li> <li>• Running</li> </ul> 
<p>Mechanism 01</p> 	<p>Mechanism 02</p> 	<p>Prototype</p> 
<p><b>OWL</b></p> <ul style="list-style-type: none"> <li>• Head rotation</li> <li>• Flapping wings</li> </ul> 	<p>Mechanism 01</p> 	<p>Prototype 01</p> 

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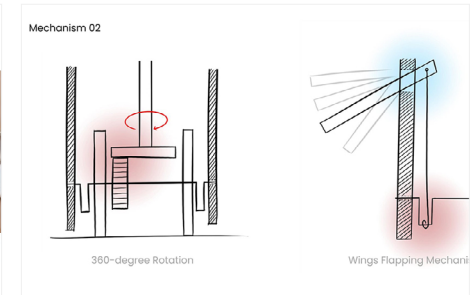
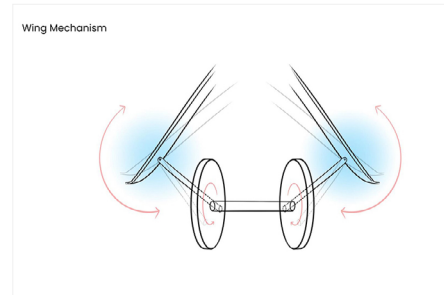
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Thank You

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6Aui. Stage 1 Presentation

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6B. Ride-on Toy - Group B

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6B. Ride-on Toy - Group B

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Case Study Download:

• **Hooti\_by Uppili Nithin Soorya B\_Report.....**

**Product Design 02**  
Wooden Toy Design



IDC School of Design  
Uppili Nithin Soorya B's presentation  
Guided by Prof. Vijay Bapat

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**Design brief**

Design a wooden toy for kids of the age group 9-24 months

**Constraints**

- Material of the toy should be wood
- It should be Push or pull toy
- The toy should mimic the biomechanical movements
- It should have attractive colors

**Animal Inspirations**

1. Bull

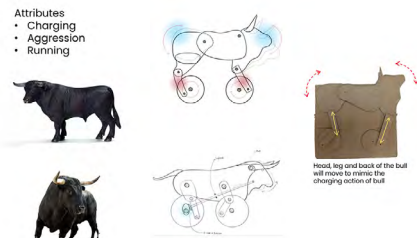
2. Double hump camel

3. Owl

**1. Bull**

Attributes

- Charging
- Aggression
- Running

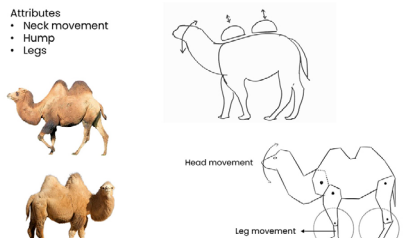


Head, leg and back of the bull will move to mimic the charging action of bull

**2. Double hump camel**

Attributes

- Neck movement
- Hump
- Legs




Head movement

Leg movement

**3. Owl (Selected Inspiration)**

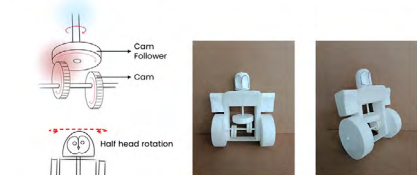
Attributes

- Head rotation
- Flapping wings




Half head rotation

**3.1 Dirty mockup (mechanism 01)**



This mechanism with off centered cams will help rotate the head back and forth to some degree.

**3.2 Dirty mockup (mechanism 02)**



The off centered pivot on the wheel will help to create the flapping motion of the wings.

Flapping of wings

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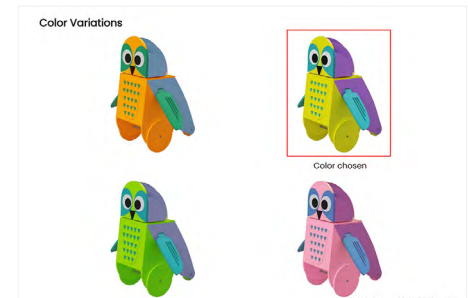
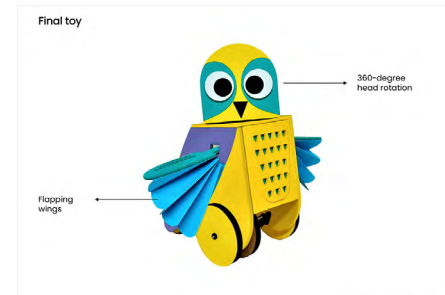
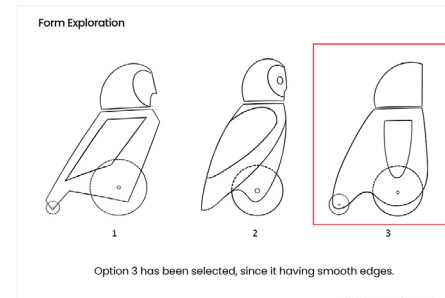
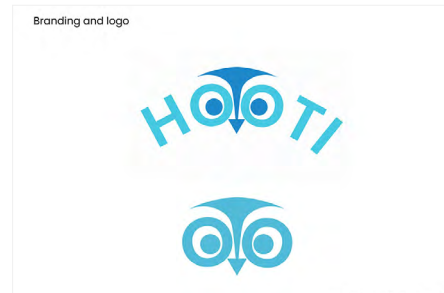
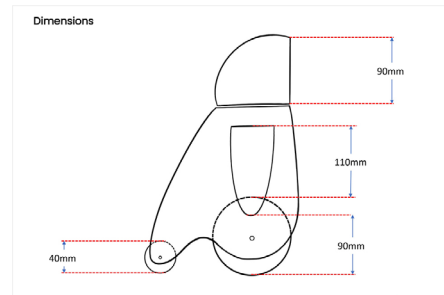
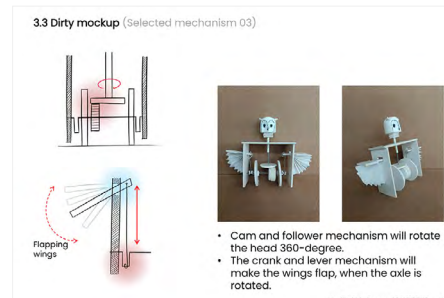
6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

10. Contact Details



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Biomimicry-inspired toys

by

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IDC, IIT Bombay

Source:

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## Poster



1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

6Ah, 6Ai, 6Aj, 6Ak, 6Al, 6Am, 6An

6Ao, 6Ap, 6Aq, 6Ar, 6As, 6At

6Au. Hooti by Uppili Nithin Soorya B

6Aui. Stage 1 Presentation

6Auii. Case Study - Slide Show

6Auiii. Poster

6Auiv. Video

6Av

6B. Ride-on Toy - Group B

7. Toys

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9. Video

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

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6Au. Hooti by Uppili Nithin Soorya B

6Aui. Stage 1 Presentation

6Auii. Case Study - Slide Show

6Auiii. Poster

6Auiv. Video

6Av

6B. Ride-on Toy - Group B

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8. Links

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## Video

Hooti by Uppili Nithin Soorya B

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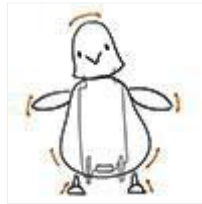
<https://dsource.in/course/indian-toy-design/students-presentations/push-toy-group/piku-vaibhav-watile>

## Piku by Vaibhav Watile

To design a wooden push/pull type toy for the children of age group 9-15 months

### Constraints

- Material used should be wood.
- The toy should not have any sharp elements.
- The mechanism should be such that it mimics the actions of the choosen animals.
- Color theme should reflect the Ladakhiness.



Stage 1 Presentation



Case Study - Slide Show

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6Aa, 6Ab, 6Ac, 6Ad, 6Ae, 6Af, 6Ag

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6Ao, 6Ap, 6Aq, 6Ar, 6As, 6At, 6Au

6Av. Piku by Vaibhav Watile

6Avi. Stage 1 Presentation

6Avii. Case Study - Slide Show

6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

10. Contact Details

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1, 2, 3, 4, 5, 6

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6Ao, 6Ap, 6Aq, 6Ar, 6As, 6At, 6Au

6Av. Piku by Vaibhav Watile

6Avi. Stage 1 Presentation

6Avii. Case Study - Slide Show

6B. Ride-on Toy - Group B

7. Toys

8. Links


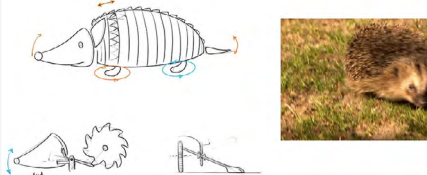

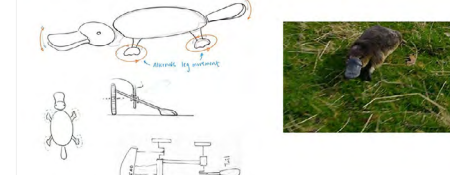

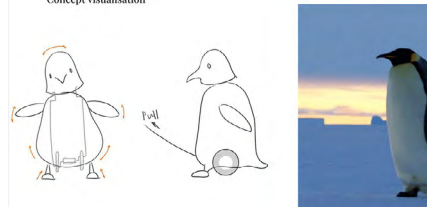
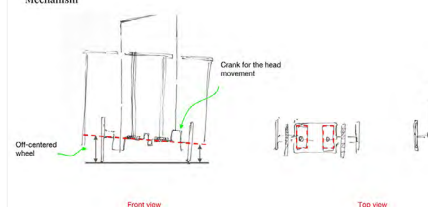
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## Stage 1 Presentation

Download:

- [Piku\\_Stage 1 Presentation\\_by Vaibhav Watile.....](#)

<p>Product Design 2</p> <h3>Toy Design</h3> <p>Guided By : Prof. Vijay Bapat</p> <p>Vaibhav Watile 216030004</p>	<p><b>Design Brief</b></p> <p>"To design a wooden push/pull type toy for the children of age group 9-15 months"</p>	<p><b>Inspiration 1 Hedgehog</b></p> 
<p><b>Concept visualisation</b></p> 	<p><b>Inspiration 2 Platypus</b></p> 	<p><b>Concept visualisation</b></p> 
<p><b>Inspiration 3 Penguin</b></p> 	<p><b>Concept visualisation</b></p> 	<p><b>Mechanism</b></p> 



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6Av. Piku by Vaibhav Watile

6Avi. Stage 1 Presentation

6Avii. Case Study - Slide Show

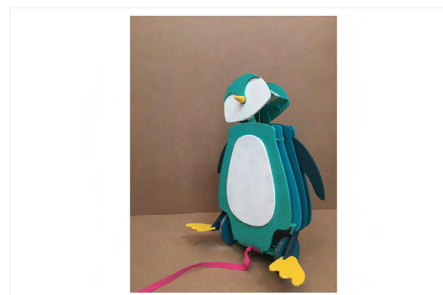
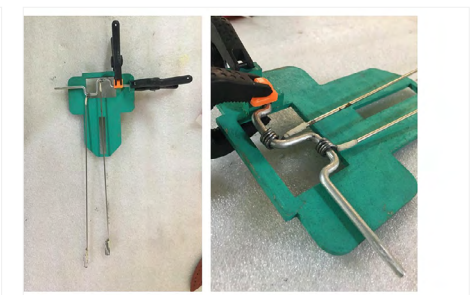
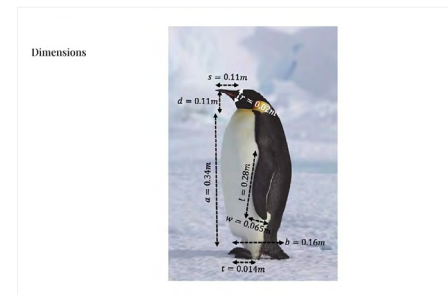
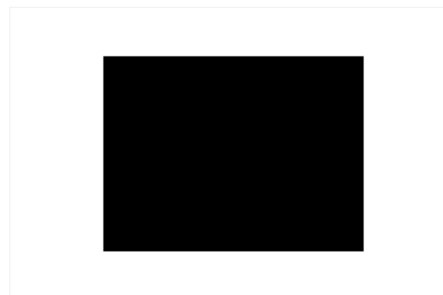
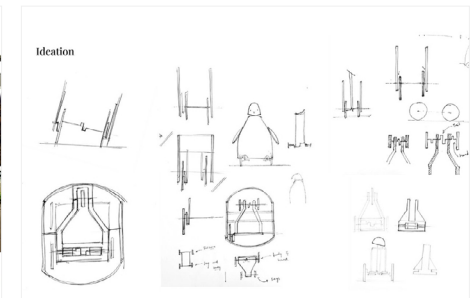
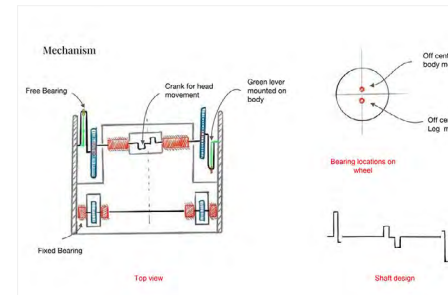
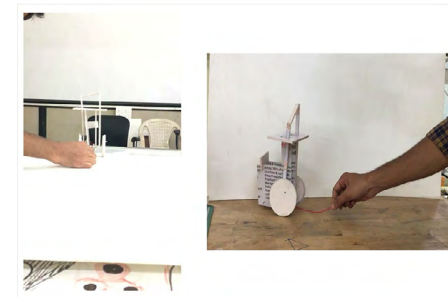
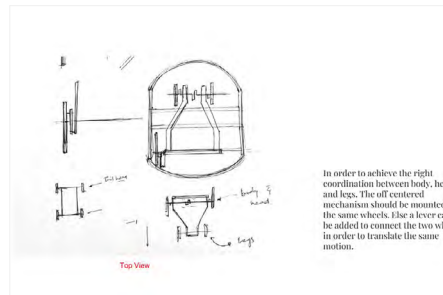
6B. Ride-on Toy - Group B

7. Toys

8. Links

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6Av. Piku by Vaibhav Watile

6Avi. Stage 1 Presentation

6Avii. Case Study - Slide Show

6B. Ride-on Toy - Group B

7. Toys

8. Links

9. Video

10. Contact Details

## Case Study - Slide Show

Case Study Download:

- **Piku\_by Vaibhav Watile\_Report.....**

Product Design 2  
**Toy Design**  
Guided By : Prof. Vijay Bapat  
Vaibhav Watile  
21609004

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**Design Brief**

"To design a wooden push/pull type toy for the children of age group 9-15 months"

**Constraints**

- Material used should be wood
- The toy should not have any sharp elements
- The mechanism should be such that it mimics the actions of the chosen animals
- Color theme should reflect the Ladakhiness

**Inspiration 1  
Hedgehog**

Concept visualisation

**Inspiration 2  
Platypus**

Concept visualisation

**Inspiration 3  
Penguin (selected animal)**

Concept visualisation

**Ideation - Mechanism**

**Ideation - Forms**

**Mechanism**

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6Av. Piku by Vaibhav Watile

6Avi. Stage 1 Presentation

6Avii. Case Study - Slide Show

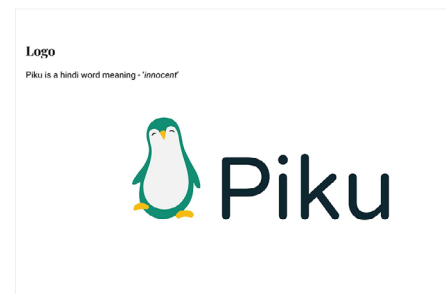
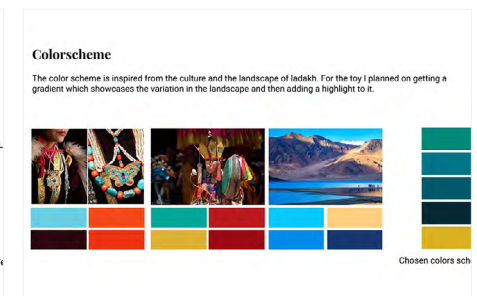
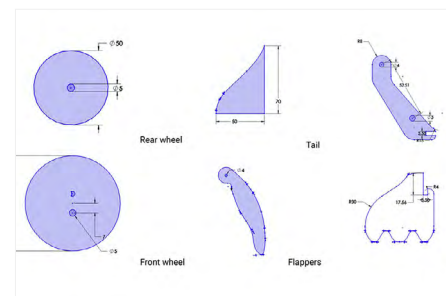
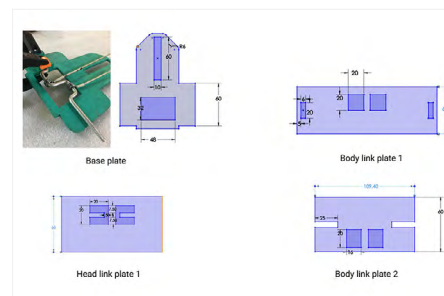
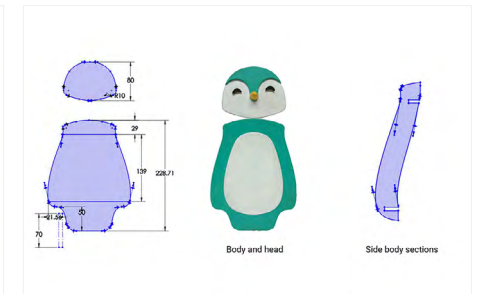
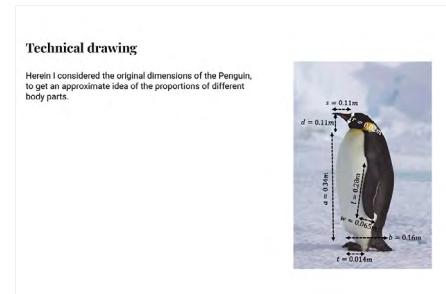
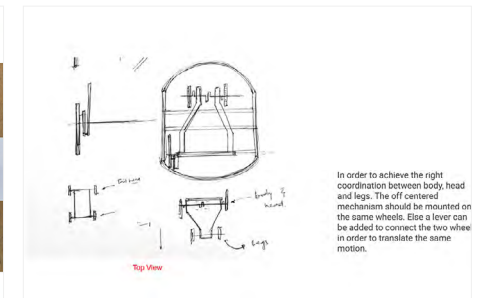
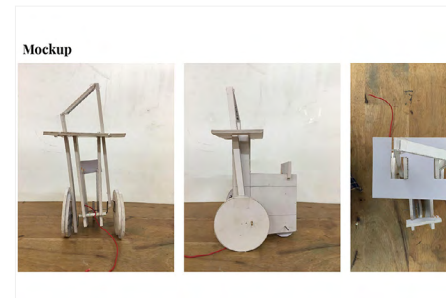
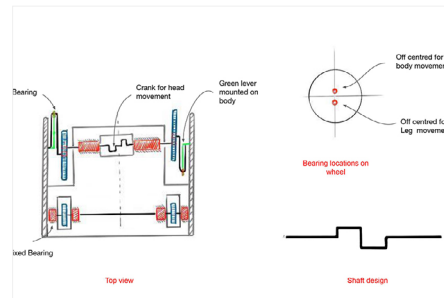
6B. Ride-on Toy - Group B

7. Toys

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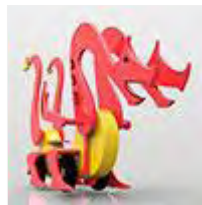
<https://dsource.in/course/indian-toy-design/students-presentations/ride-toy-group-b>

1. Introduction
2. Theme of the Course
3. Difference Between Idea and Concept
4. Product Design Insights
5. Understanding Toy Mechanism
6. Students Presentations
  - 6A. Push Toy - Group A
  - 6B. Ride-on Toy - Group B
    - 6Ba, 6Bb, 6Bc, 6Bd, 6Be, 6Bf, 6Bg
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## Ride-on Toy - Group B

The exercise was assigned as part of the Product Design Module during the second semester of the Junior M. Des. Industrial Design course at IDC, IIT Bombay, under the guidance of Prof. Vijay Bapat. The class of 14 students was split into two groups of 7 each. Group A was tasked with designing a push toy for 9-15-month-olds, while Group B was tasked with designing a ride-on toy for 6-12-year-olds. Group A had the additional constraint of using only wood or processed wood as their material. The duration of the module was three weeks.

Group B choose to design ride-on toy. Design Insights followed by Group B.....



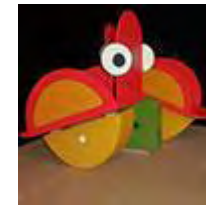
Blaze by Apurba Mondal



Bobster by Archana



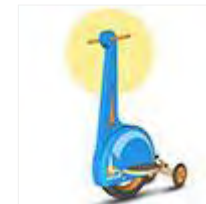
Crabuggy by Maddu Shravan Murali



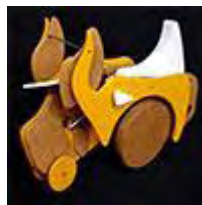
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Arcadia by Sukanta Maharana



Hornsby by Vinod Louis Joseph Swamy



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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6B. Ride-on Toy - Group B

6Ba. Blaze by Apurba Mondal

6Bai. Stage 1 Presentation

6Baii. Case Study - Slide Show

6Baiii. Poster

6Baiv. Video

6Bb, 6Bc, 6Bd, 6Be, 6Bf, 6Bg

7. Toys

8. Links

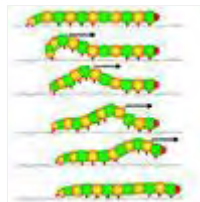
9. Video

10. Contact Details

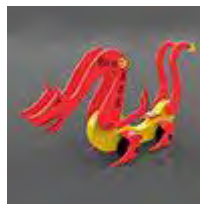
## Blaze by Apurba Mondal

Children of all age groups like to play but specifically, children of age groups 6-12 years tend to engage in outdoor activities and use playground equipments such as swings, slides, see-saw, and Monkey bars. The assigned task as part of the Product Design 2 module conducted by Prof. Vijay Bapat was to design a ride-on playground equipment for them that aids in their physical and psychological growth by taking inspiration from Biomimetics and Biomimicry.

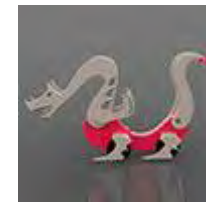
The aim of the project is to design playground equipment for children of age group 6-12 years of age for a middle to upper-class settlement. It would be multiplayer equipment with elements of surprise and humor but can also be used by a single user. It must be a ride-on equipment whose movement or/and form emulates an animal or Insect and is in full control of the user. The mechanism involved should be simple for the ease of manufacturing, maintenance and reduction of cost. The usage should be moderately difficult for the cognitive and physical development of the child. There should be an immediate feedback mechanism that aids in instilling confidence in parents as well as the child.



Stage 1 Presentation



Poster



Case Study - Slide Show



Video

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## Biomimicry-inspired toys

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1, 2, 3, 4, 5, 6

## 6A. Push Toy - Group A

## 6B. Ride-on Toy - Group B

## 6Ba. Blaze by Apurba Mondal

## 6Bai. Stage 1 Presentation

## 6Baii. Case Study - Slide Show

## 6Baiiii. Poster

## 6Baiv. Video

6Bb, 6Bc, 6Bd, 6Be, 6Bf, 6Bg

## 7. Toys

## 8. Links

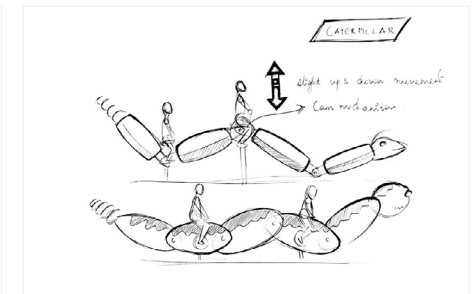
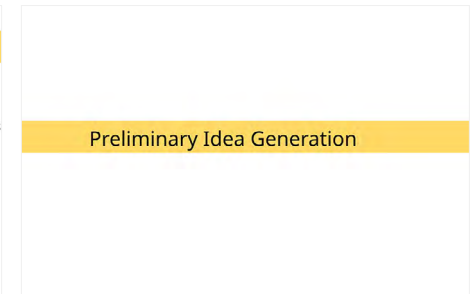
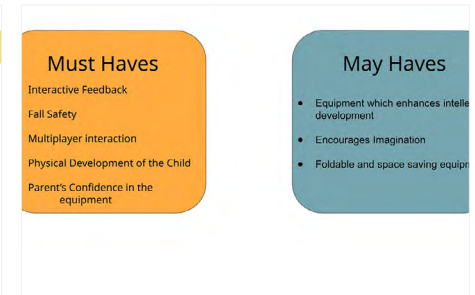
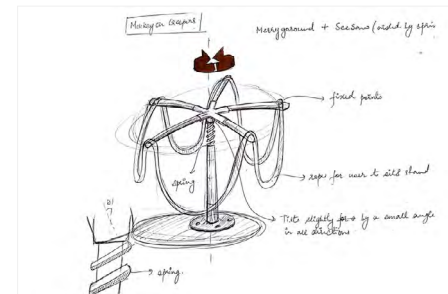
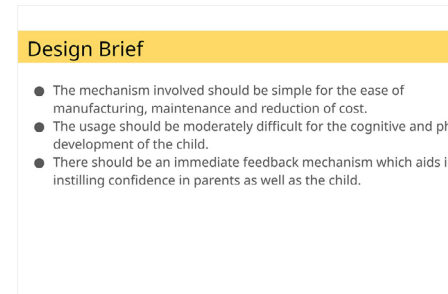
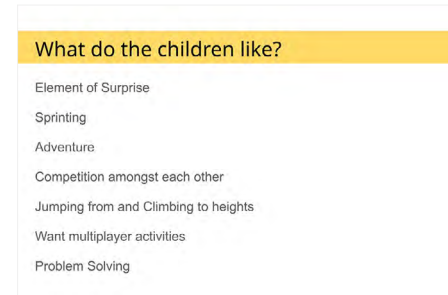
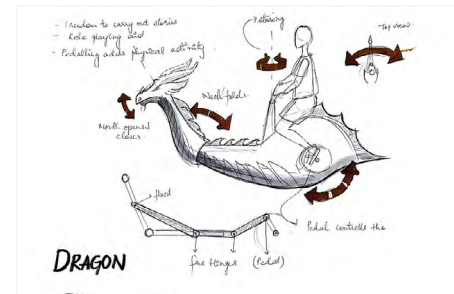
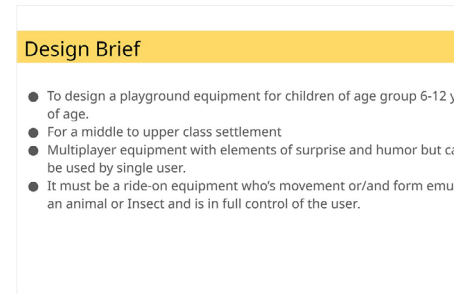
## 9. Video

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## Stage 1 Presentation

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# Indian Toy Design

Biomimicry-inspired toys

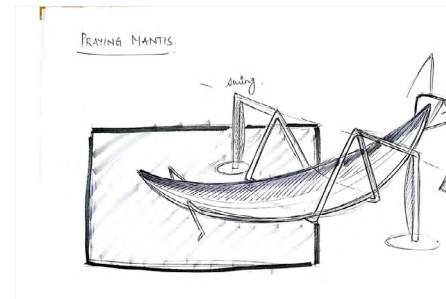
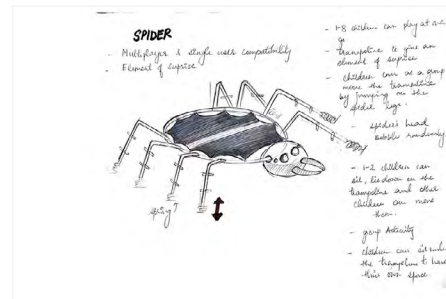
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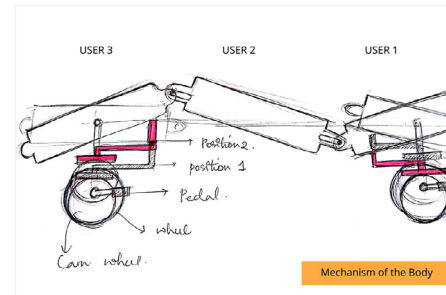
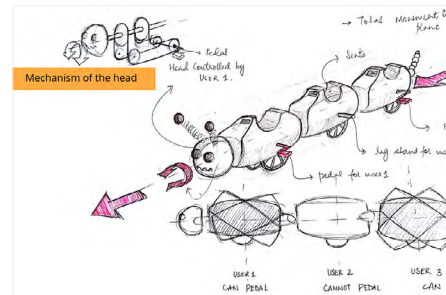
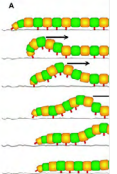
<https://dsource.in/course/indian-toy-design/students-presentations/ride-toy-group-b/blaze-apurba-mondal/stage-1>



Final Idea



Caterpillar



1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6B. Ride-on Toy - Group B

6Ba. Blaze by Apurba Mondal

6Bai. Stage 1 Presentation

6Baii. Case Study - Slide Show

6Baiii. Poster

6Baiv. Video

6Bb, 6Bc, 6Bd, 6Be, 6Bf, 6Bg

7. Toys

8. Links

9. Video

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## Biomimicry-inspired toys

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1, 2, 3, 4, 5, 6

## 6A. Push Toy - Group A

## 6B. Ride-on Toy - Group B

## 6Ba. Blaze by Apurba Mondal

## 6Bai. Stage 1 Presentation

## 6Baii. Case Study - Slide Show

### 6Baiiii. Poster

## 6Baiv. Video

6Bb, 6Bc, 6Bd, 6Be, 6Bf, 6Bg

## 7. Toys

## 8. Links

## 9. Video

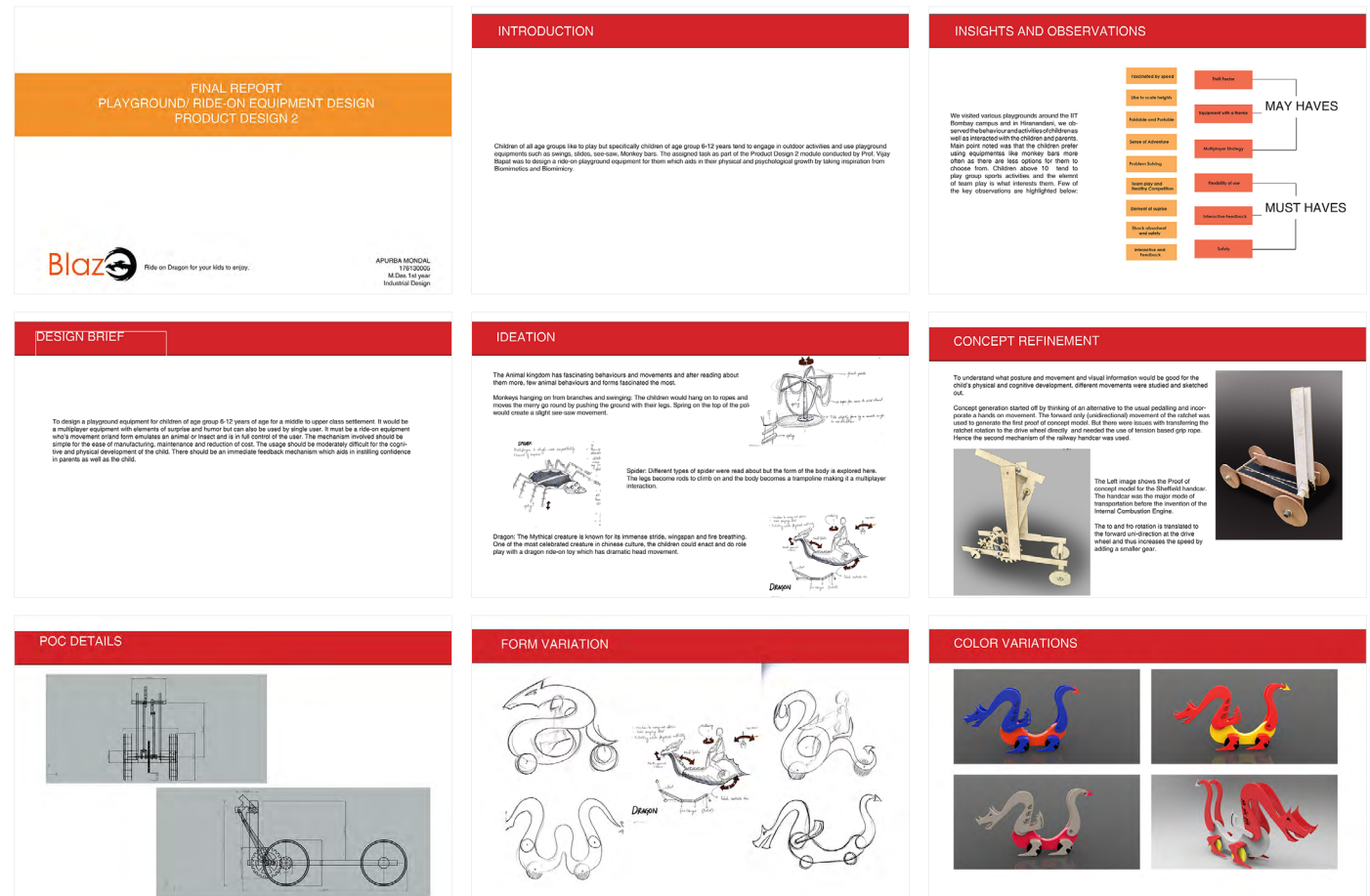
## 10. Contact Details

## Case Study - Slide Show

## Case Study Download:

- **Blaze\_by Apurba Mondal.....**

- **Blaze\_by Apurba Mondal\_Report.....**





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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6B. Ride-on Toy - Group B

6Ba. Blaze by Apurba Mondal

6Bai. Stage 1 Presentation

6Baii. Case Study - Slide Show

6Baiii. Poster

6Baiv. Video

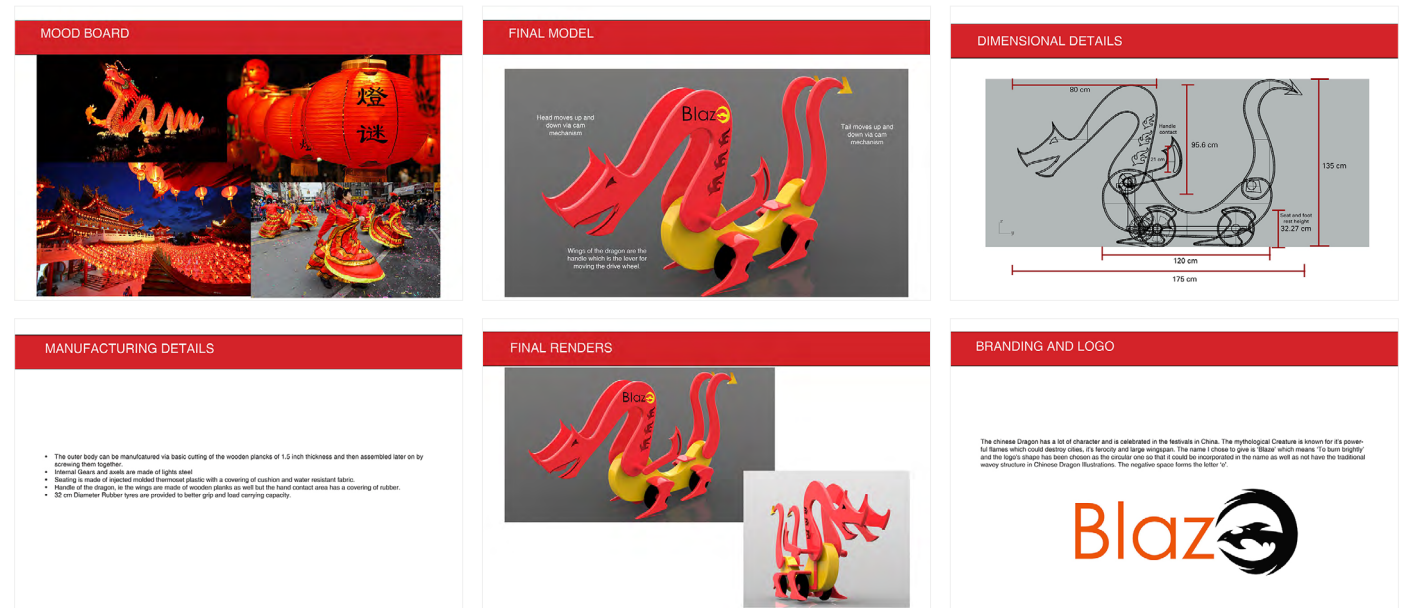
6Bb, 6Bc, 6Bd, 6Be, 6Bf, 6Bg

7. Toys

8. Links

9. Video

10. Contact Details



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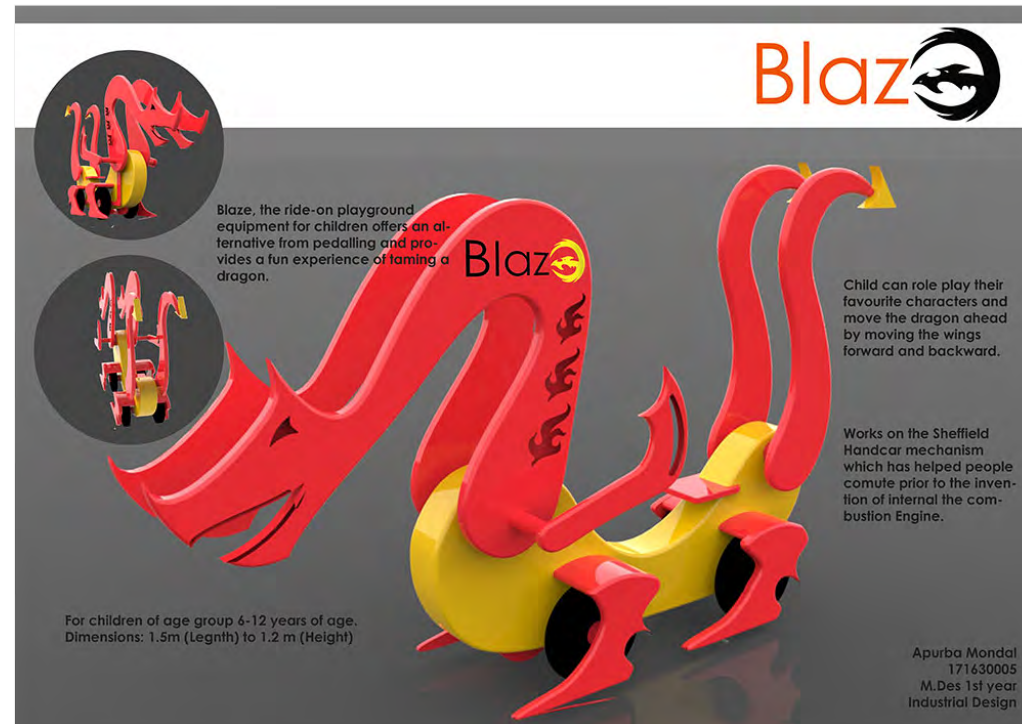
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6Bb, 6Bc, 6Bd, 6Be, 6Bf, 6Bg

7. Toys

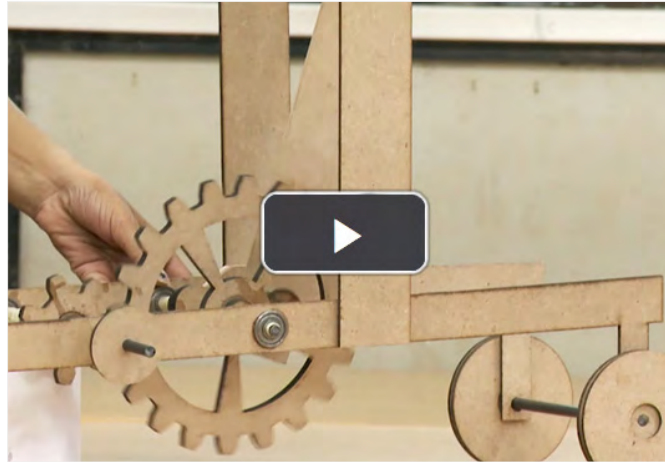
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## Video

Final Presentation by Apurba Mondal



YouTube Video Link.....

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6Bb. Bobster by Archana

6Bbi. Stage 1 Presentation

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6Bbiii. Poster

6Bbiv. Video

6Bc, 6Bd, 6Be, 6Bf, 6Bg

7. Toys

8. Links

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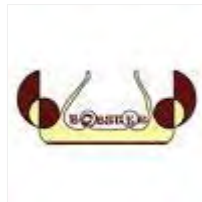
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## Bobster by Archana

The aim of the project is to design an innovative playful ride-on equipment for children of age group 6 – 12 years of age to be used outdoors. The solution should encourage physical and creative development in children while promoting a cohesive play environment.



Stage 1 Presentation



Poster



Case Study - Slide Show



Video



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6Bb. Bobster by Archana

6Bbi. Stage 1 Presentation

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6Bbiii. Poster

6Bbiv. Video

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## Stage 1 Presentation

Download:

• [Bobster\\_Stage 1 Presentation\\_by Archana S.....](#)

### KIDS PRODUCTS FOR PLAY ENVIRONMENT :

#### BIOMIMETIC APPROACH

ARCHANA S.  
176130010  
IDC, IIT BOMBAY

### Design Statement

- To design an innovative playful ride on equipment for child age group 5 – 12 years of age to be used indoor and outdoor
- The solution should encourage physical and creative development in children while promoting a cohesive play environment.

### WHY RIDE - ON TOYS?

- It promotes physical activity and exercise.
- It hones fine and gross motor skills
- One can teach rules
- It ignites creativity
- You can widen vocabulary
- It fosters independent play
- Spatial Awareness
- Encourages exploration and adventure
- Group Play

### Case Study

### Concept ideation

Mushroom as inspiration

### Final ideas

Physical motion of animals as inspiration

Hopper Bike

Gorilla tricycle

### Turning tortoise

Drawing inspiration from the round shell of the tortoise

### Rabbit - on

### Creepy crawlly

### Hopp - it

### Thank you

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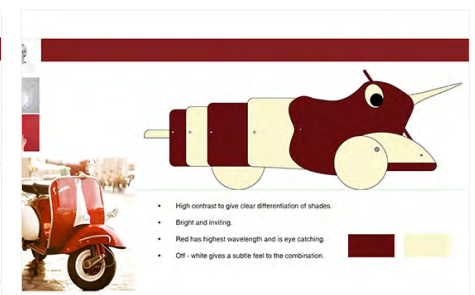
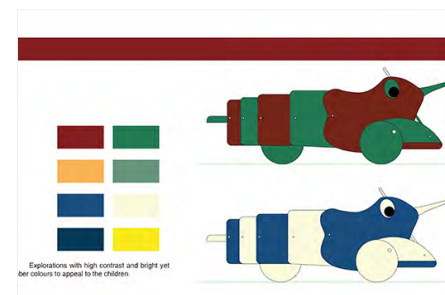
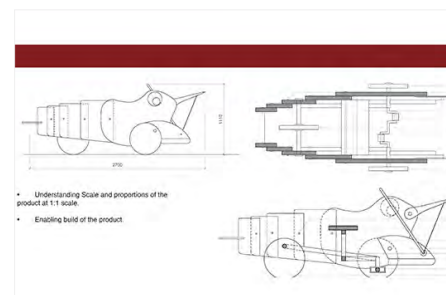
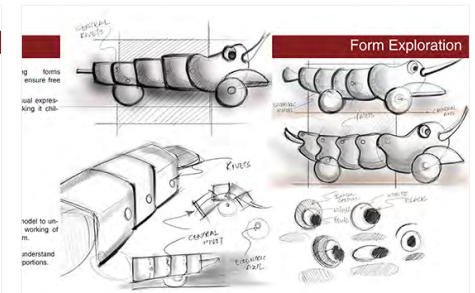
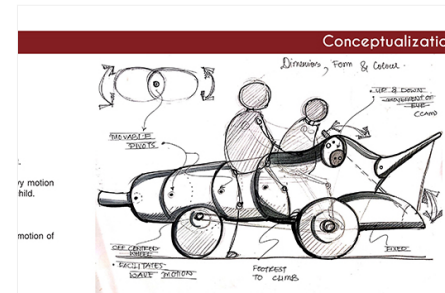
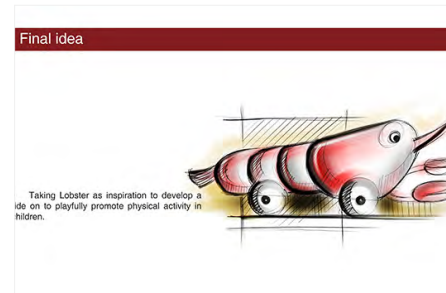
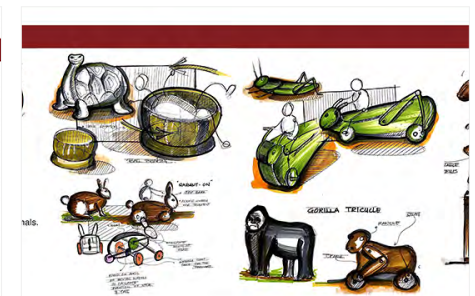
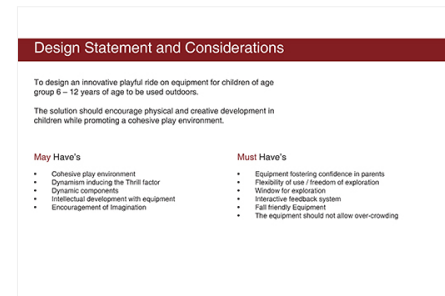
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## Case Study - Slide Show

Case Study Download:

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6B. Ride-on Toy - Group B

6Ba. Blaze by Apurba Mondal

6Bb. Bobster by Archana

6Bbi. Stage 1 Presentation

6Bbii. Case Study - Slide Show

6Bbiii. Poster

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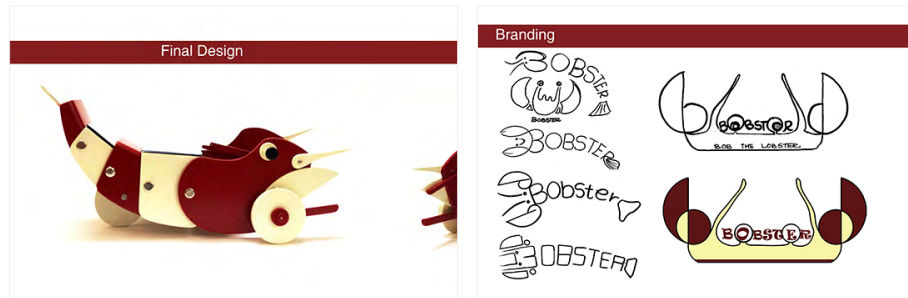
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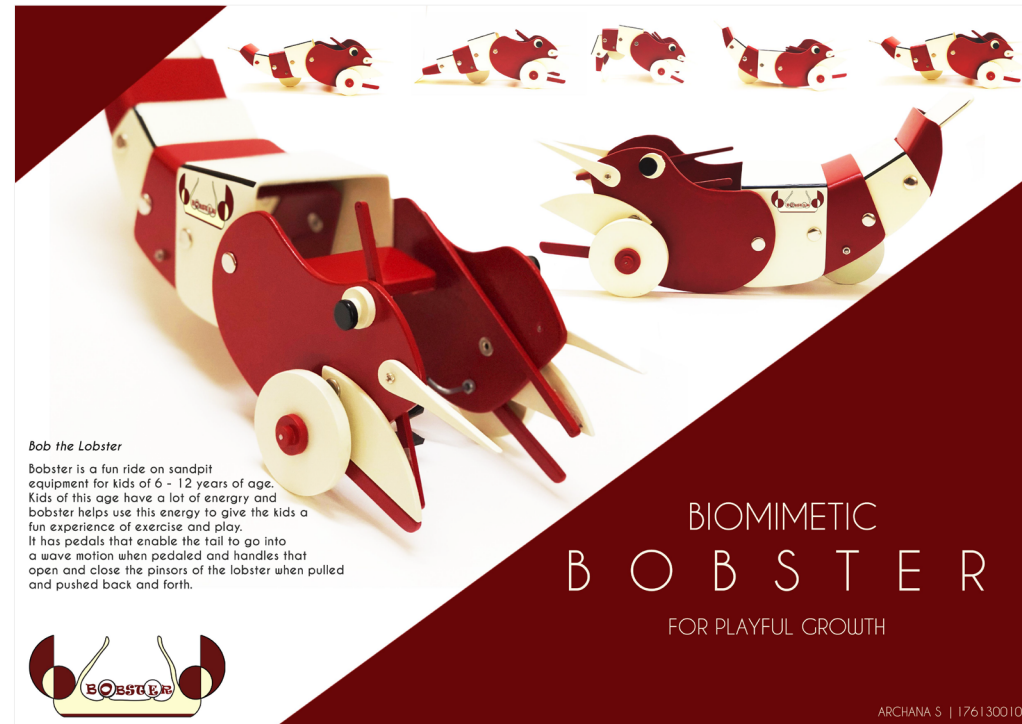
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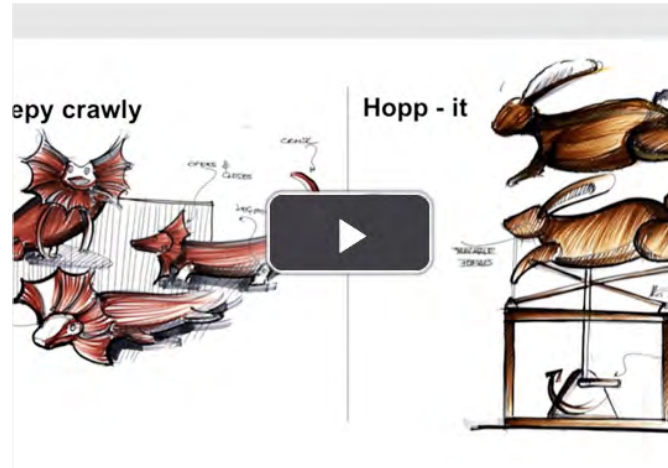
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## Video

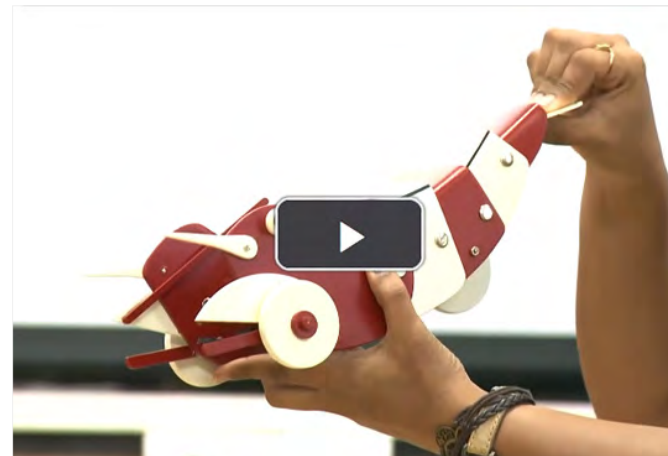
Presentation Stage 1 by Archana S

YouTube Video Link.....

Toy Design Mechanism by Archana S

YouTube Video Link.....

Bobster by Archana S

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6Ba, 6Bb

6Bc. Crabuggy by Maddu S. M.

6Bci. Stage 1 Presentation

6Bcii. Case Study - Slide Show

6Bciii. Poster

6Bciv. Video

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7. Toys

8. Links

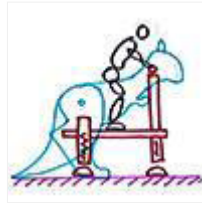
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## Crabuggy by Maddu Shravan Murali

A ride-on is more than a toy. It is a tool for the development of physical, mental, cognitive, emotional, and social skills. Pedal-powered ride-on toys can help in the development of children's motor skills and understand simple mechanisms. It also provides an understanding of spatial relations and kinaesthetic senses. It encourage exploration and provides the perfect means for young kids to explore their surroundings environment.

Role playing activities can greatly enhance the cognitive abilities of children. It provides an opportunity to work out their problem solving and analytical skills and to understand complex cause and effect relationships.



Stage 1 Presentation



Poster



Case Study - Slide Show



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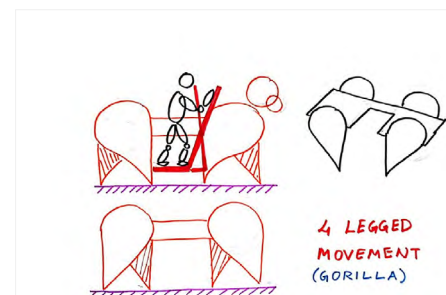
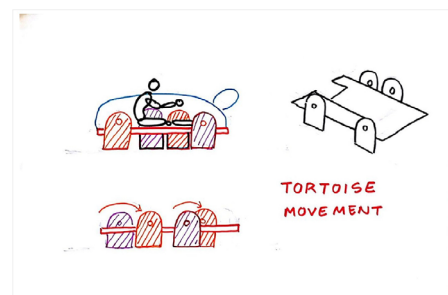
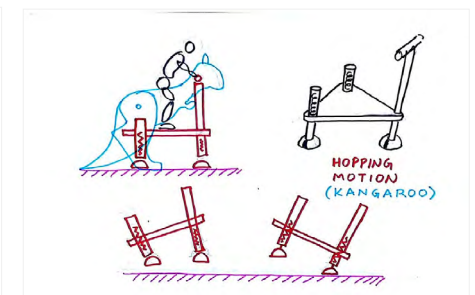
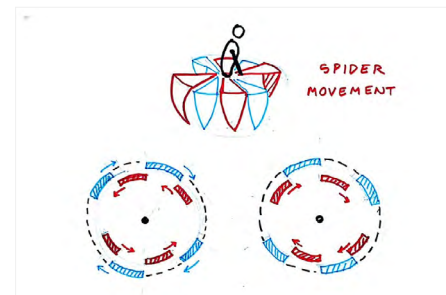
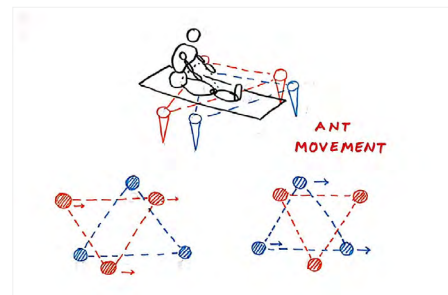
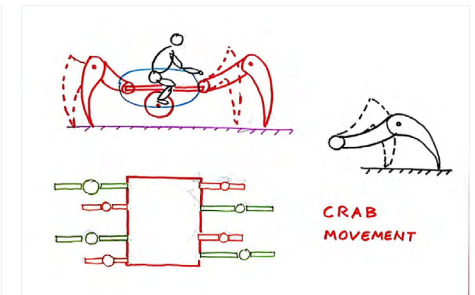
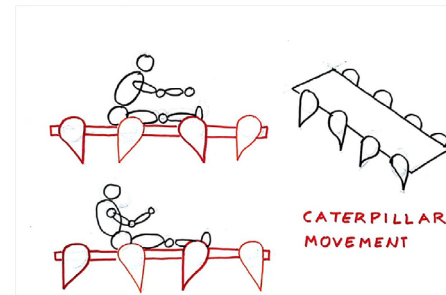
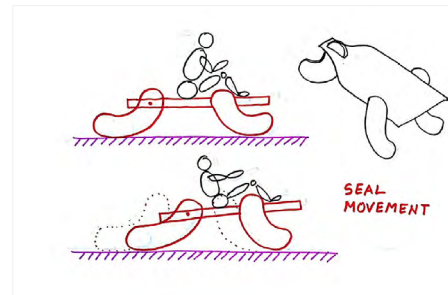
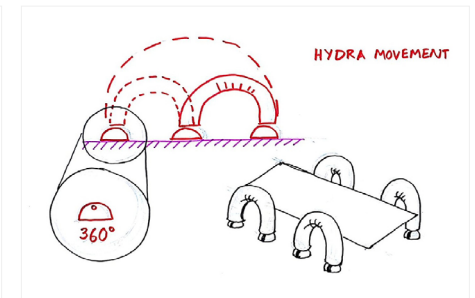
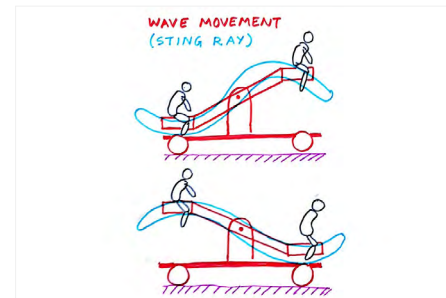
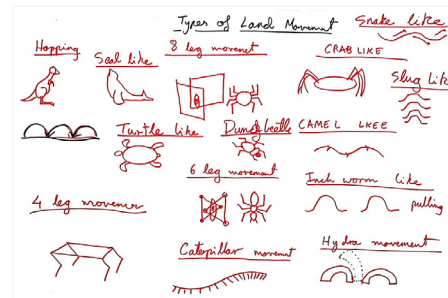
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6A. Push Toy - Group A

6B. Ride-on Toy - Group B

6Ba, 6Bb

6Bc. Crabuggy by Maddu S. M.

6Bci. Stage 1 Presentation

6Bcii. Case Study - Slide Show

6Bciii. Poster

6Bciv. Video

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## Case Study - Slide Show

Case Study Download:

- [Crabuggy\\_by Maddu Shravan Murali.....](#)
- [Crabuggy\\_by Maddu Shravan Murali\\_Report.....](#)



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Exploded view	13
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### Introduction

A ride on is more than a toy. It is a tool for the development of physical, mental, cognitive, emotional, and social skills.

Pedal powered ride on toys can help in the development of children's motor skills and understand simple mechanisms.

It also provides an understanding of spatial relations and kinesthetic senses.

It Encourage Exploration and provides the perfect means for young kids to explore their surroundings environment.

Role playing activities can greatly enhance the cognitive abilities of children. It provides an opportunity to work out their problem solving and analytical skills, and to understand complex cause and effect relationships.

### Insights

Group A: PLAYGROUND EQUIPMENT OR RIDE ON

Sl. No.	Initial Observation	Design Insights	
1	Safe to use height	Thrill factor	
2	Adjustable by Speed and Height	Space manipulating equipment with ease of assembly	
3	Foldable and Portable	Equipment could have dynamic components	
4	Static Jungle Gym	Equipment with a theme	
5	Need of Adventure	Enhancing intellectual development with equipment	
6	Not much safety in playground	Equipment with multiplayer strategy	
7	Problem Solving		
8	Team Play		
9	Healthy Competition in Children		
10	Less Learning		
11	Damage of Skin due to hard material	Softer material for contact points	
12	Encouragement of Imagination		
13	Parents at home parents	Equipment instilling confidence in parents	
14	Unreliability in Play	Flexibility of use	
15	Presence of Ropes		
16	Curious	Window for exploration	
17	Breakdown of Use		
18	Feedback	Interactive feedback system	
19	Clashroom Sander	Full friendly	
20	Shock Absorber		
21	Well Ventilated	The equipment should not allow overcrowding	

### Design Brief

**Design statement:**  
To design a ride on device which create a sense of curiosity in children of age group 6-12 years.

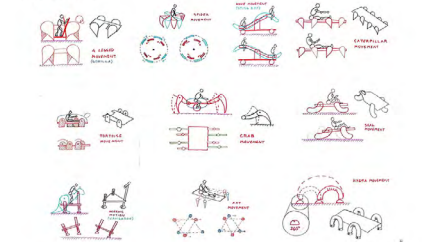
**What is the micro environment for usage?:**  
It will be an outdoor product, mostly in outdoor play areas.

**What experience this product need to create?:**  
Playfulness, adventure, thrill, team play, competitiveness.

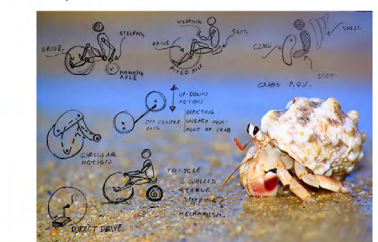
**What is the frequency of its usage?:**  
It will be a use at leisure, single user product.

**What is the USP of the product?:**  
Movement inspired by animals or insects

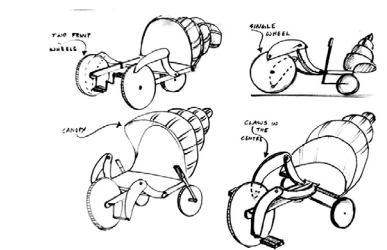
### Ideations:



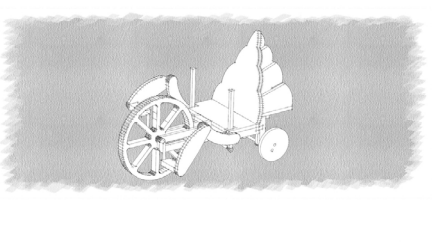
### Concept finalization



### Form variation:



### Final form:



1, 2, 3, 4, 5, 6

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6Ba, 6Bb

6Bc. Crabuggy by Maddu S. M.

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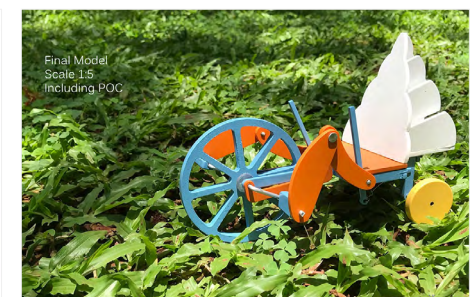
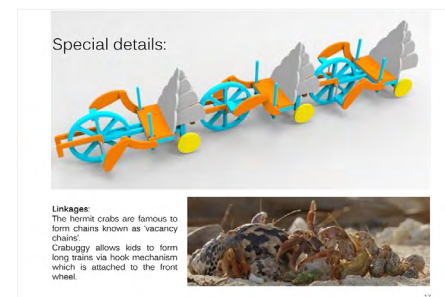
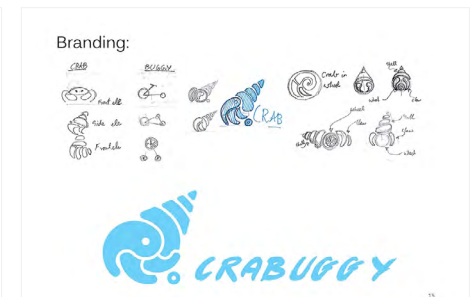
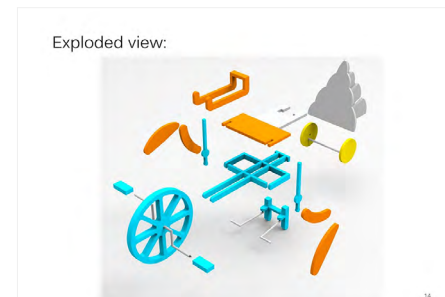
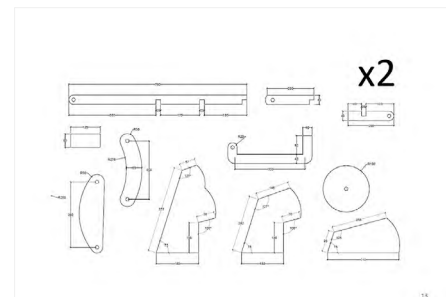
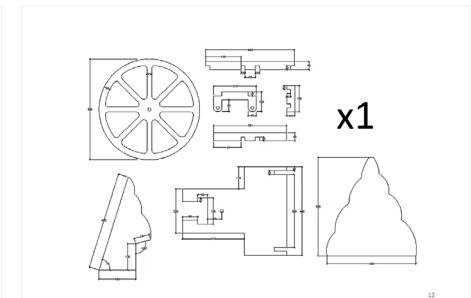
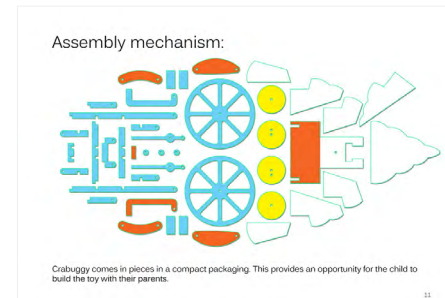
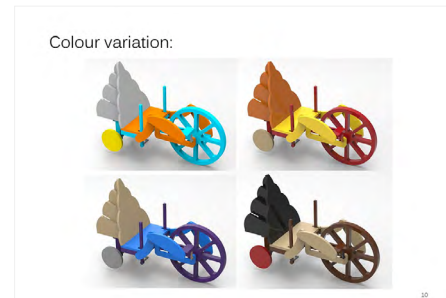
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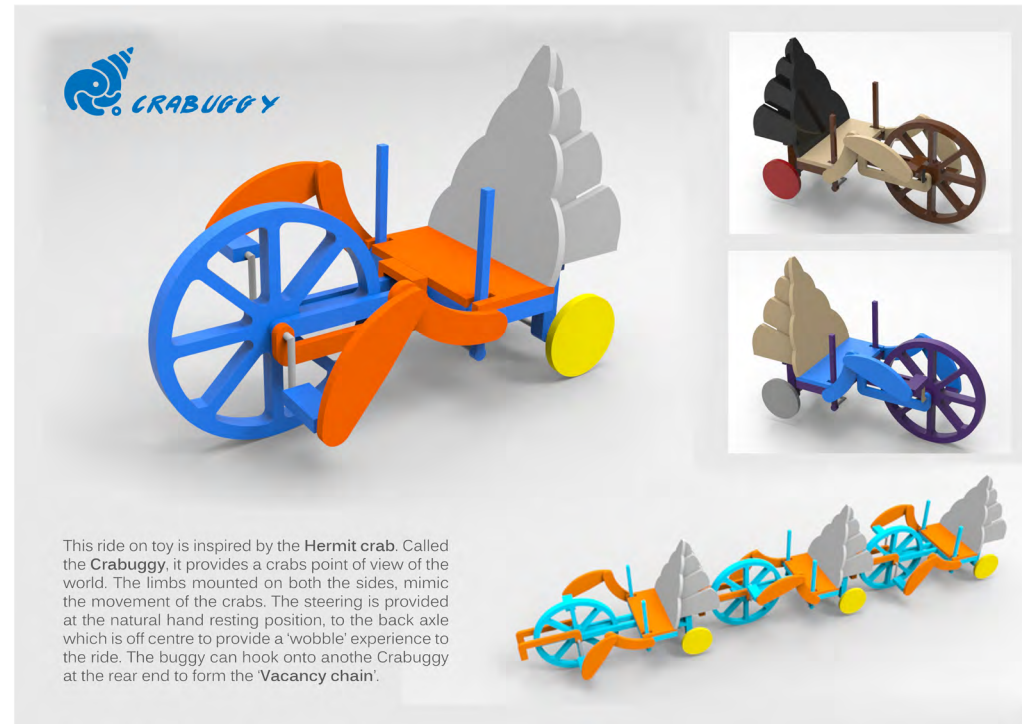
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6Bciii. Poster

6Bciv. Video

6Bd, 6Be, 6Bf, 6Bg

7. Toys

8. Links

9. Video

10. Contact Details

## Video

Final Presentation by Maddu Shravan Murali



YouTube Video Link.....



Design Course

## Indian Toy Design

Biomimicry-inspired toys

by

Prof. Vijay Bapat

IDC, IIT Bombay

Source:

<https://dsource.in/course/indian-toy-design/students-presentations/ride-toy-group-b/teerox-minu>

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6B. Ride-on Toy - Group B

6Ba, 6Bb, 6Bc

6Bd. Teerox by Minu

6Bdi. Stage 1 Presentation

6Bdii. Case Study - Slide Show

6Bdiii. Poster

6Bdiv. Video

6Be, 6Bf, 6Bg

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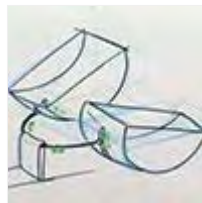
## Teerox by Minu

Kids are known to be creative and innocent minded. They play and not only enjoy toys but also develop their physical skills subconsciously while playing on outdoor or indoor products. They are known to explore and love adventures. They are very curious and easily get attached to toys and playing devices around them.

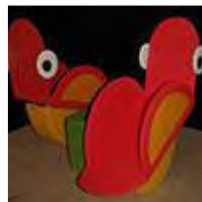
Our classroom was divided into two separate groups. Group 'B' was to design playground equipment or ride-on products for the user group of 6 to 12 years while Group 'A' was to design a wooden toy for the user group of 9 to 15 months.

In order to complete the products some of the important methods and approaches were taken which are briefly discussed in this report for Group 'B'.

The aim of the project is to design a playground or ride-on equipment for the user age group of 6-12 years which could help kids - To develop physical skills like pushing or pulling with the involvement of other kids/friends in the ground. The product can be indoor or outdoor.



Stage 1 Presentation



Poster



Case Study - Slide Show



Video

A hand-drawn diagram illustrating the movement of a caterpillar. At the top, a box is labeled "CATERPILLAR". Below it, a caterpillar is shown in a series of four stages of movement. A vertical double-headed arrow indicates "slight up & down movement". A horizontal arrow points to the right, labeled "Com. mechanism". The caterpillar's body is segmented, and its legs are shown in different positions to demonstrate the wave-like motion of its body.

Design Course

# Indian Toy Design

Biomimicry-inspired toys

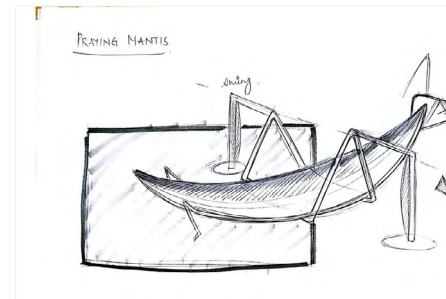
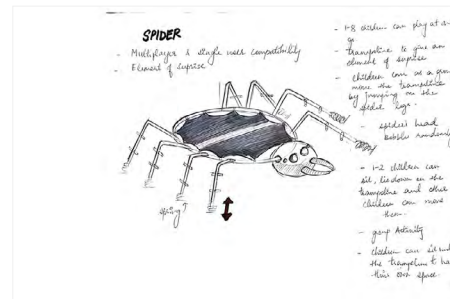
by

Prof. Vijay Bapat

IDC, IIT Bombay

Source:

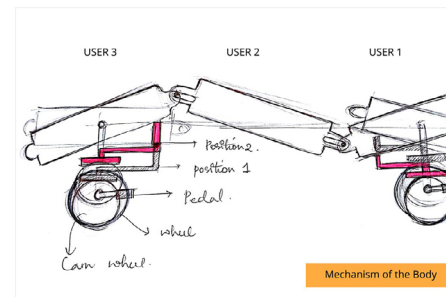
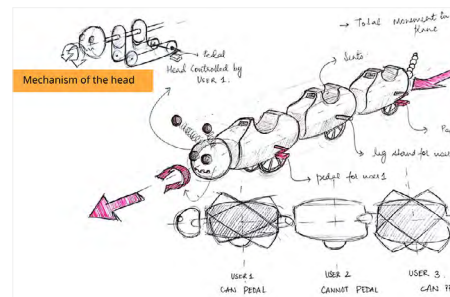
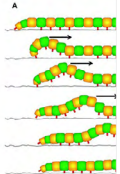
<https://dsource.in/course/indian-toy-design/students-presentations/ride-toy-group-b/teerox-minu/stage-1-presentation>



Final Idea



Caterpillar



1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6B. Ride-on Toy - Group B

6Ba, 6Bb, 6Bc

6Bd. Teerox by Minu

6Bdi. Stage 1 Presentation

6Bdii. Case Study - Slide Show

6Bdiii. Poster

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## Biomimicry-inspired toys

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## 6B. Ride-on Toy - Group B

6Ba, 6Bb, 6Bc

## 6Bd. Teerox by Minu

## 6Bdi. Stage 1 Presentation

## 6Bdii. Case Study - Slide Show

### 6Bdiii. Poster

## 6Bdiv. Video

6Be, 6Bf, 6Bg

## 7. Toys

## 8. Links

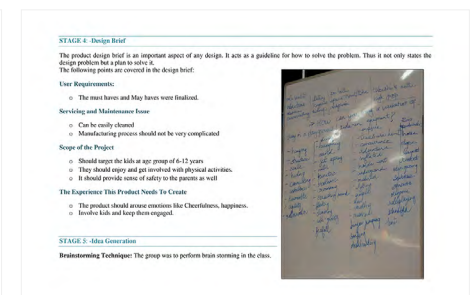
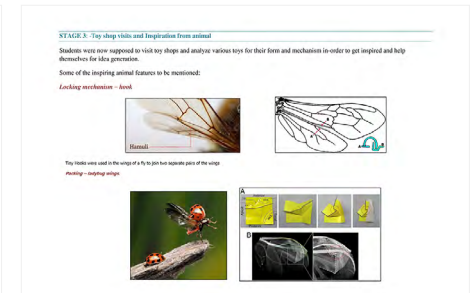
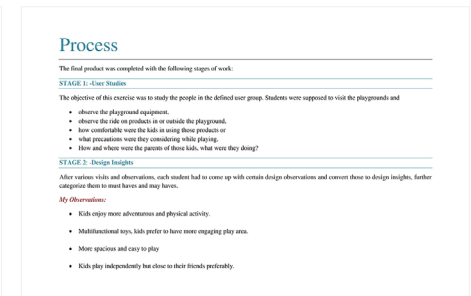
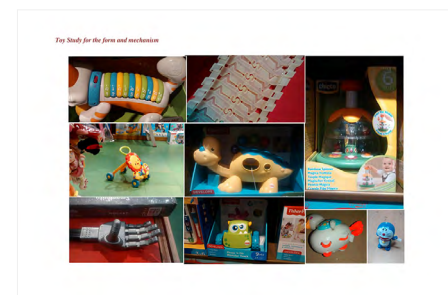
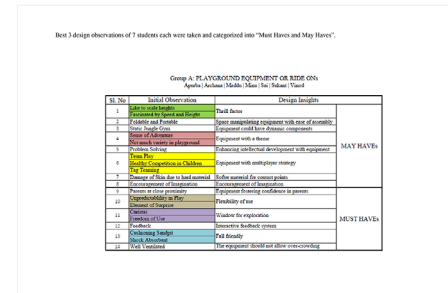
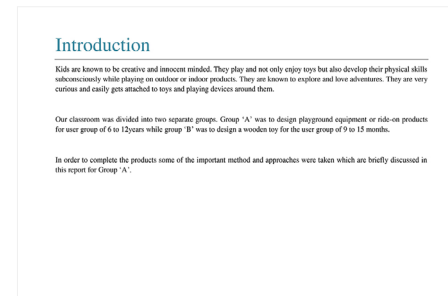
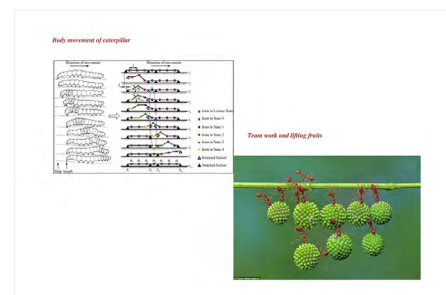
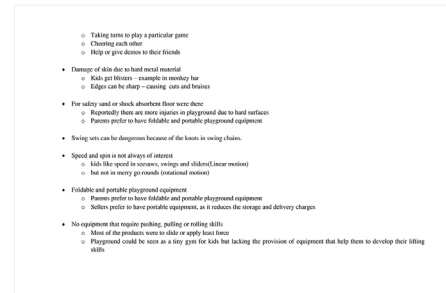
## 9. Video

## 10. Contact Details

## Case Study - Slide Show

### Case Study Download:

- Teerox by Minu.....
- Teerox by Minu\_Report.....





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6Bdi. Stage 1 Presentation

6Bdii. Case Study - Slide Show

6Bdiii. Poster

6Bdiv. Video

6Be, 6Bf, 6Bg

7. Toys

8. Links

9. Video

10. Contact Details

## Design Brief

Design a playground or ride-on equipment for the user age group of 6-12 years which could help kids  
- To develop the physical skills like pushing or pulling with the involvement of other kids/friends in the ground. The product can be indoor or outdoor.

### MUST HAVES:

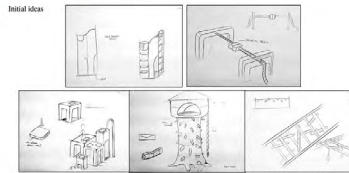
- Flexibility of use
- Window for exploration
- Full friendly
- Equipment should not allow over crowding

### MAY HAVES:

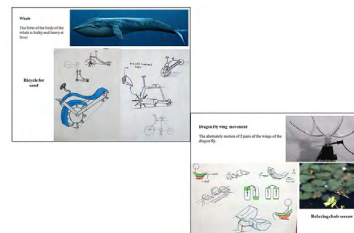
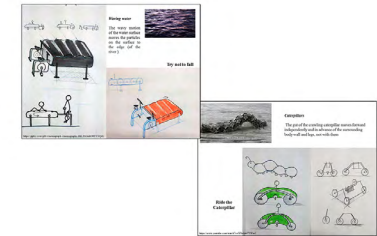
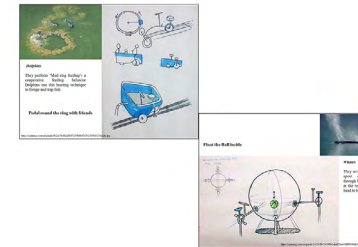
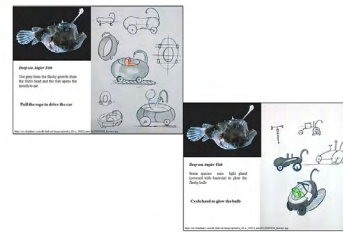
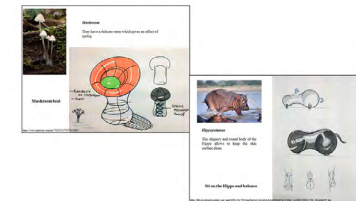
- Softer material for contact points
- Equipment with a theme
- Thrill factor

## Ideation Process

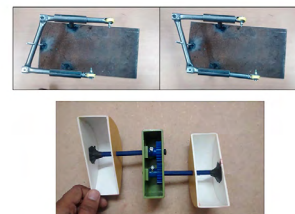
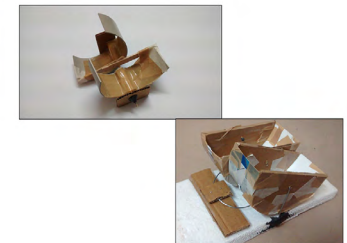
### Initial Ideas



### 10 best ideas and corresponding inspiration from nature



## Prototype, POC and Mechanism



## Conceptualization

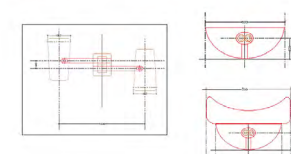
In order to finalize the concept, the marking for each of the top 10 ideas was done on the basis some common factors which are listed in the table below:

	A	B	C	D	E	F	G	H	I	J
Ease of Use	0	0	+1	-1	-1	-1	-1	-1	0	+1
Ease of manufacturing	+1	+1	0	0	0	-1	-1	0	+1	0
Assembly ease	+1	-1	0	-1	0	-1	-1	0	0	+1
Portability	-1	-1	0	0	0	-1	-1	0	0	-1
Mechanism	0	0	+1	+1	0	+1	0	-1	+1	+1
Safety for kids	0	-1	0	0	-1	0	-1	-1	-1	+1
Novelty	0	0	+1	+1	0	+1	+1	-1	0	+1
	+1	-2	+3	0	-2	-2	-4	-3	-1	+4

Based on the above markings the relaxing chair securo was considered for taking on to further implementation.

## Dimensional Parameters

### Final mechanism



\*All Dimensions in mm

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6B. Ride-on Toy - Group B

6Ba, 6Bb, 6Bc

6Bd. Teerox by Minu

6Bdi. Stage 1 Presentation

6Bdii. Case Study - Slide Show

6Bdiii. Poster

6Bdiv. Video

6Be, 6Bf, 6Bg

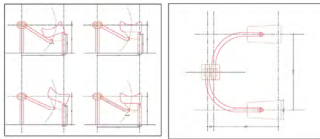
7. Toys

8. Links

9. Video

10. Contact Details

Other gear mechanism



\*All dimensions in mm

## Bill of Materials

Parts	Material	Manufacturing process
Gears	Brass	Honing
Seat	Fiber glass or ABS	Hand Lay-Up (Open Molded)/Fiberglass molding (Fiberglass), Rotational molding(ABS)
Metal rod	Steel	Extrusion
Covering for gears	Aluminum	Sheet Bending

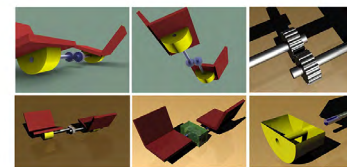
## Form Variation for the seat



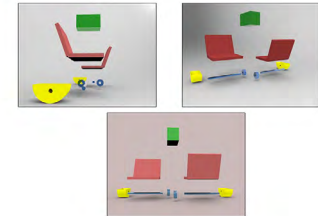
## Color Variation



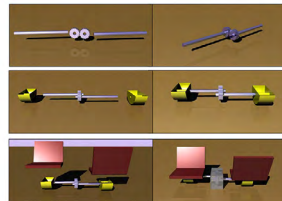
## Rendered 3D View



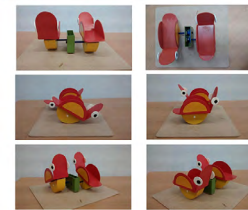
## Exploded View



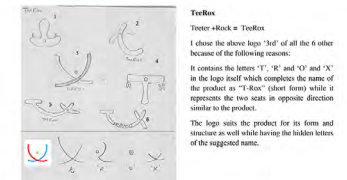
## Assembly



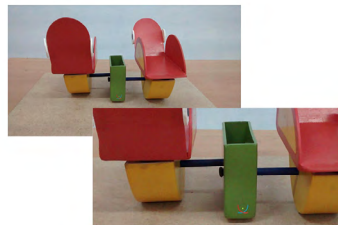
## Final Product



## Product Branding



"Teerox" on the product



## Reference

1. <https://www.lifetime.com/rowing-set-accessories>
2. <https://kidshealth.org/en/parents/playground.html>
3. <https://www.anderson.org/en/threads-feelings-child-social-situations/playground-playdates/8-common-playground-problems-and-how-to-help>
4. <http://www.cbc.ca/news/playground-equipment-involved-in-rising-number-of-injuries-1.1358497>
5. <http://www.sciencedirect.com/science/article/pii/S100207100002871>
6. <http://www.mlink.com/~donclark/perform/traumstom.html>
7. <https://www.sundae.com/normal-map/>
8. [https://en.wikipedia.org/wiki/Fiberglass\\_molding](https://en.wikipedia.org/wiki/Fiberglass_molding)
9. <https://www.arnoldheadinc.com/fiberglass-manufacturing-process/>
10. <https://www.youtube.com/watch?v=phnZ1-jdQ00>

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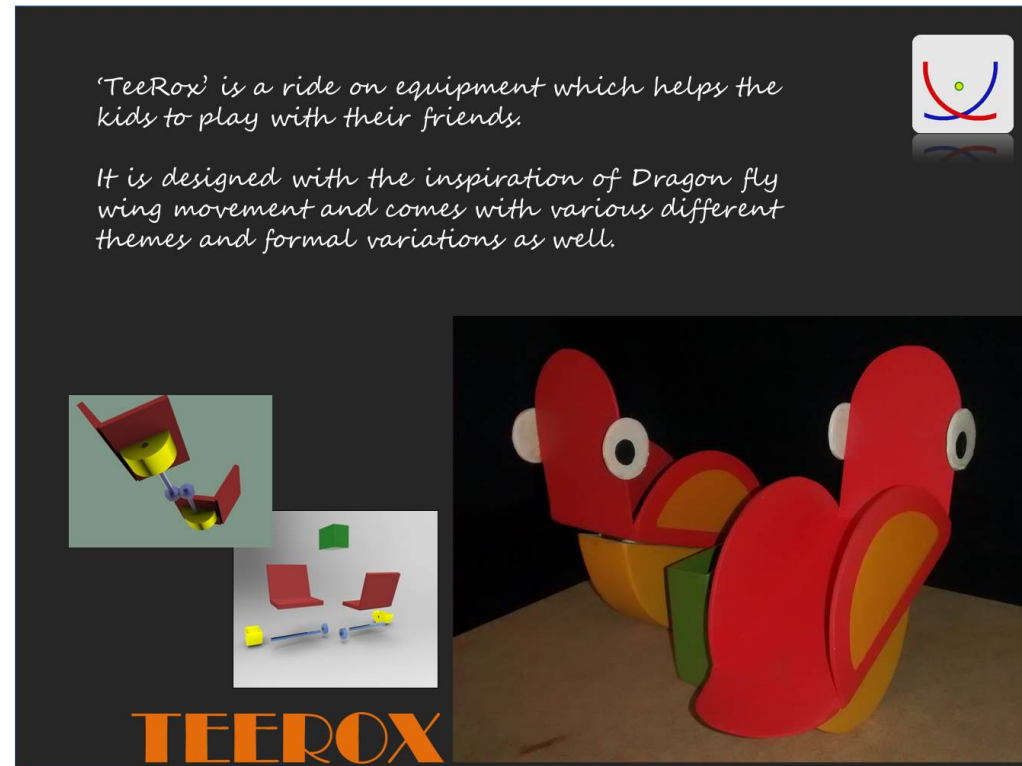
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## Poster



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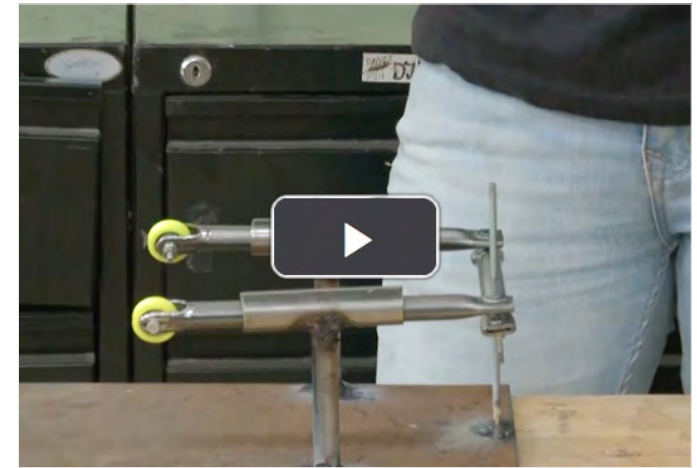
10. Contact Details

## Video

Presentation Stage 1 by Minu

YouTube Video Link.....

Toy Design Mechanism by Minu

YouTube Video Link.....

Teerox by Minu

YouTube Video Link.....



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Source:

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6B. Ride-on Toy - Group B

6Ba, 6Bb, 6Bc, 6Bd

6Be. Charger by Saijith MS

6Bei. Stage 1 Presentation

6Beii. Case Study - Slide Show

6Beiii. Poster

6Beiv. Video

6Bf, 6Bg

7. Toys

8. Links

9. Video

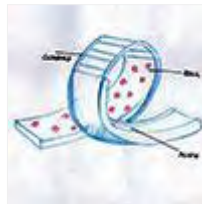
10. Contact Details

## Charger by Saijith MS

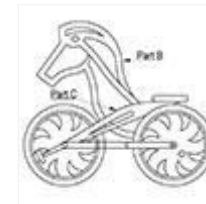
### Designing For Kids Is Not Child's Play

Children make huge developmental leaps every single year of their lives. They constitute a widely diverse range of behaviors and abilities. In this module of Product Design-2, we were trying to understand the outdoor playing behavior of kids and trying to find out innovative and creative ideas to make the play more useful for them and pleasurable. Six to twelve year old kids were chosen as the user group for this particular project. Biomimetics was given as a theme for the project.

User studies, Field studies, and online case studies were done to understand the user group. Discussions were done in groups about the major observations, analysis and inferences which further led to the formulation of a design brief.



Stage 1 Presentation



Case Study - Slide Show



Poster



Video

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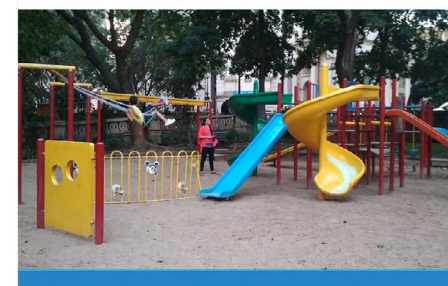
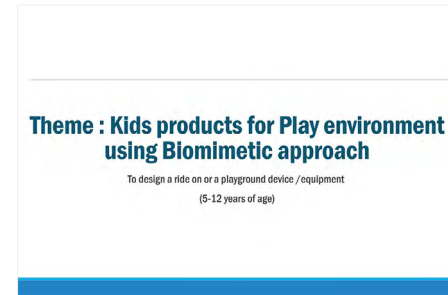
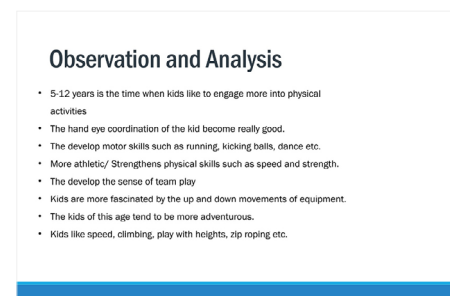
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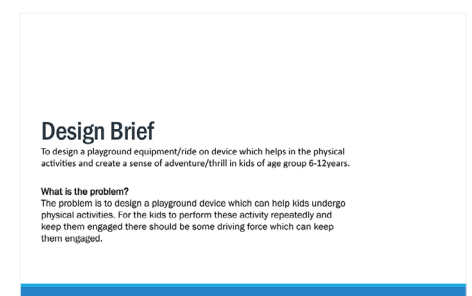
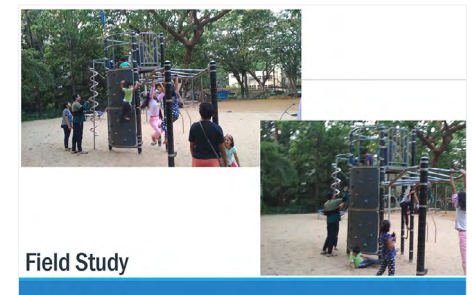
## Stage 1 Presentation

Download:

• [Charger\\_Stage 1 Presentation\\_by Saijith M S.....](#)



Group A: PLAYGROUND EQUIPMENT OR RIDE ONs Apurba   Archana   Madhu   Minu   Sai   Sakam   Vinod		
Sl. No	Initial Observation	Design Insights
1	Excited by speed heights Fascinated by Speed and Heights	Thrill factor
2	Foldable and Portable	Space manipulating equipment with ease of assembly
3	Static Jumping Gym	Equipment could have dynamic components
4	Sense of Adventure	Equipment with a theme
5	Problem Solving	Enhancing intellectual development with equipment
6	Team Play	Equipment with multiplayer strategy
7	Healthy Competition in Children	
8	Damage of Skin due to hard material	Softer material for contact points
9	Encouragement of Imagination	Encouragement of Imagination
9	Parents at close proximity	Equipment fostering confidence in parents
10	Unpredictability in Play	Flexibility of use
10	Element of Surprise	
11	Curious	Window for exploration
12	Freedom of Use	
13	Feedback	Interactive feedback system
14	Safe	Safe friendly
15	Shock Absorbant	
14	Well Maintained	The equipment should not allow over-crowding



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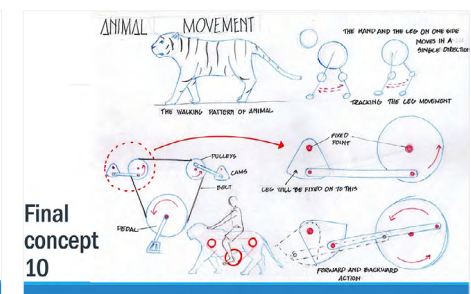
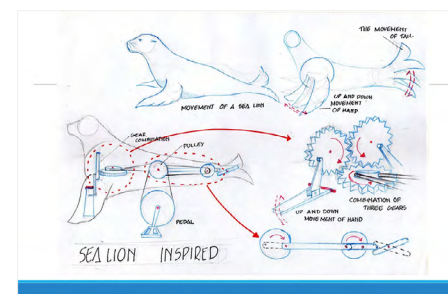
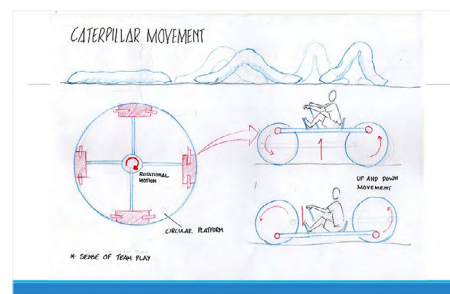
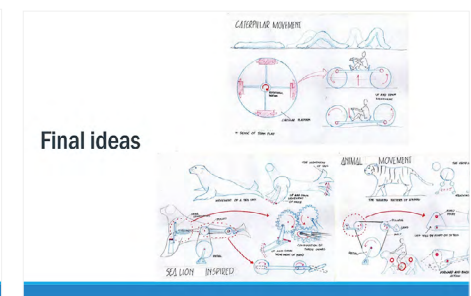
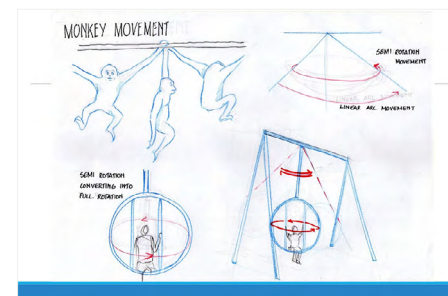
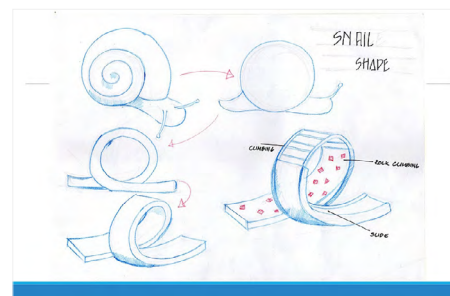
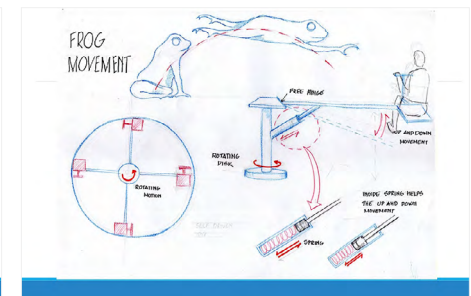
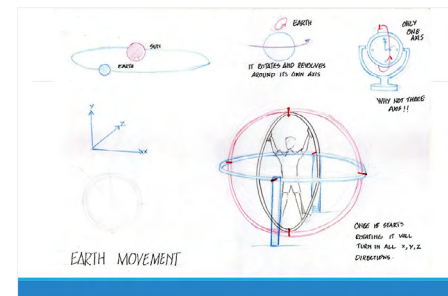
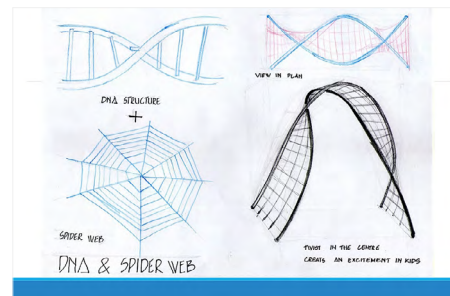
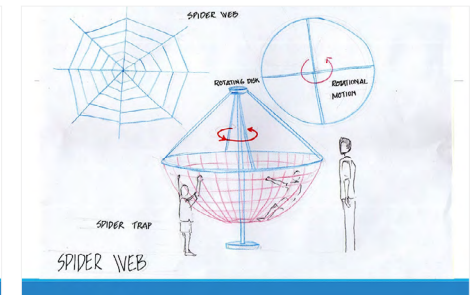
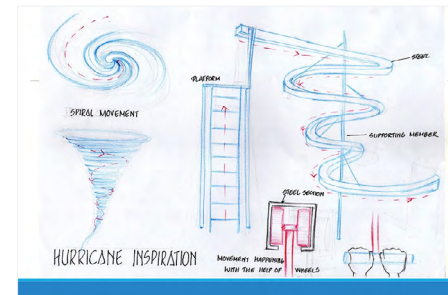
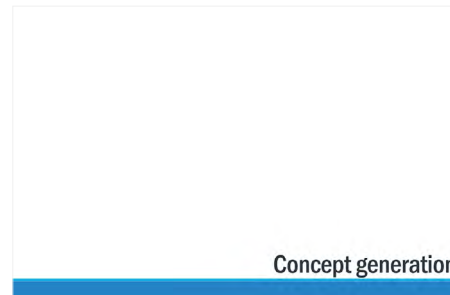
6Bf, 6Bg

7. Toys

8. Links

9. Video

10. Contact Details





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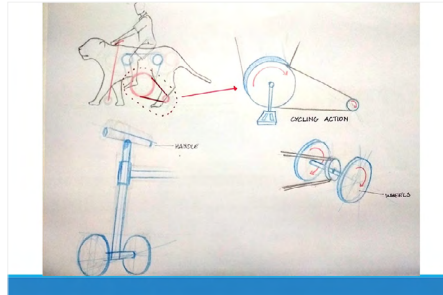
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Biomimicry-inspired toys

by

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IDC, IIT Bombay



Thank you

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6B. Ride-on Toy - Group B

6Ba, 6Bb, 6Bc, 6Bd

6Be. Charger by Saijith MS

6Bei. Stage 1 Presentation

6Beii. Case Study - Slide Show

6Beiii. Poster

6Beiv. Video

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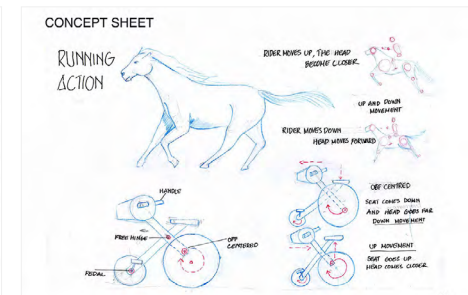
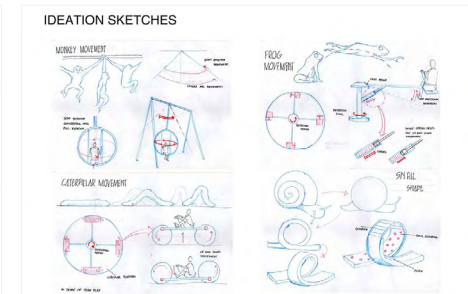
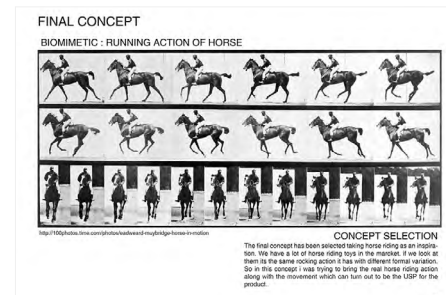
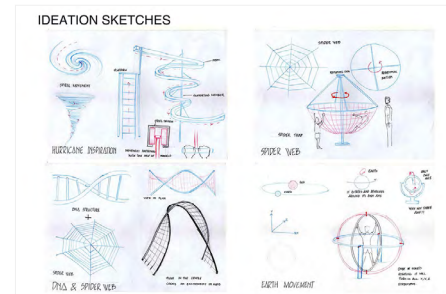
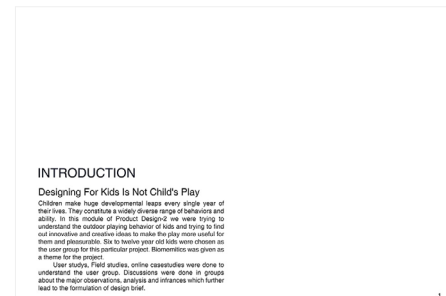
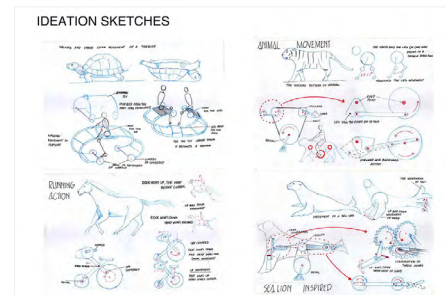
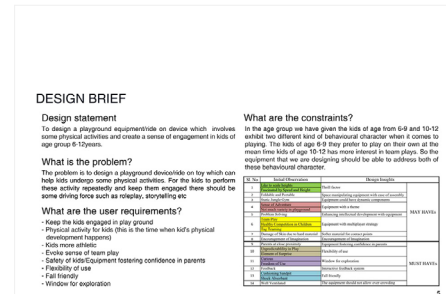
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<https://dsource.in/course/indian-toy-design/students-presentations/ride-toy-group-b/charger-saijith-ms/case-study>

## Case Study - Slide Show

Case Study Download:

- **Charger by Saijith M S.....**
- **Charger by Saijith M S\_Report.....**



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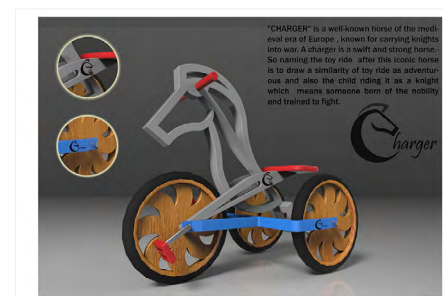
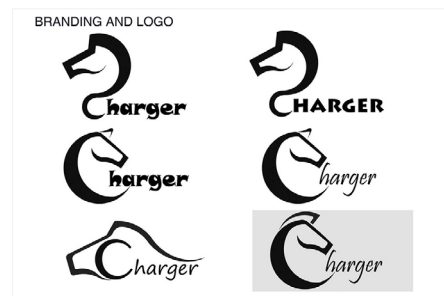
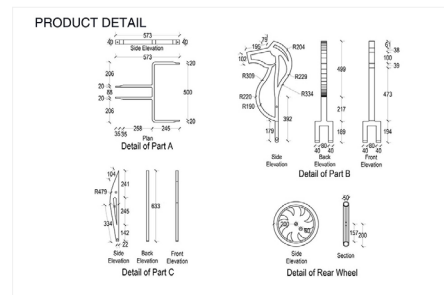
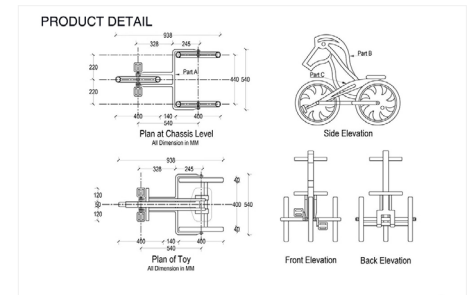
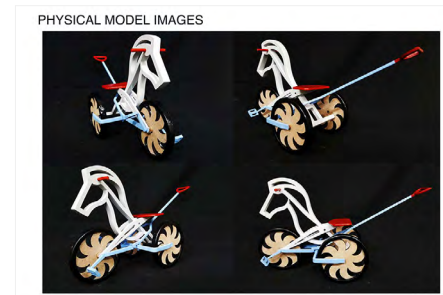
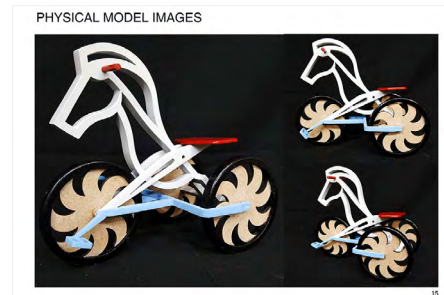
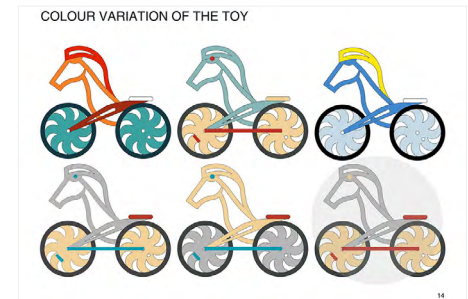
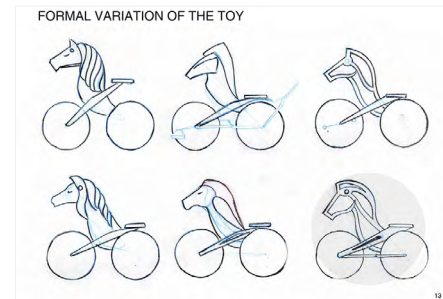
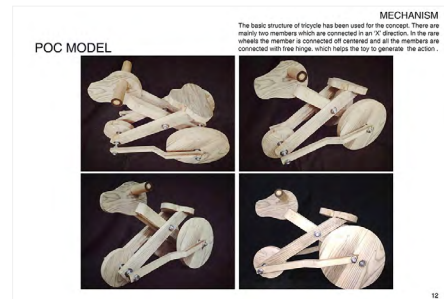
6Bf, 6Bg

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6Beiv. Video

6Bf, 6Bg

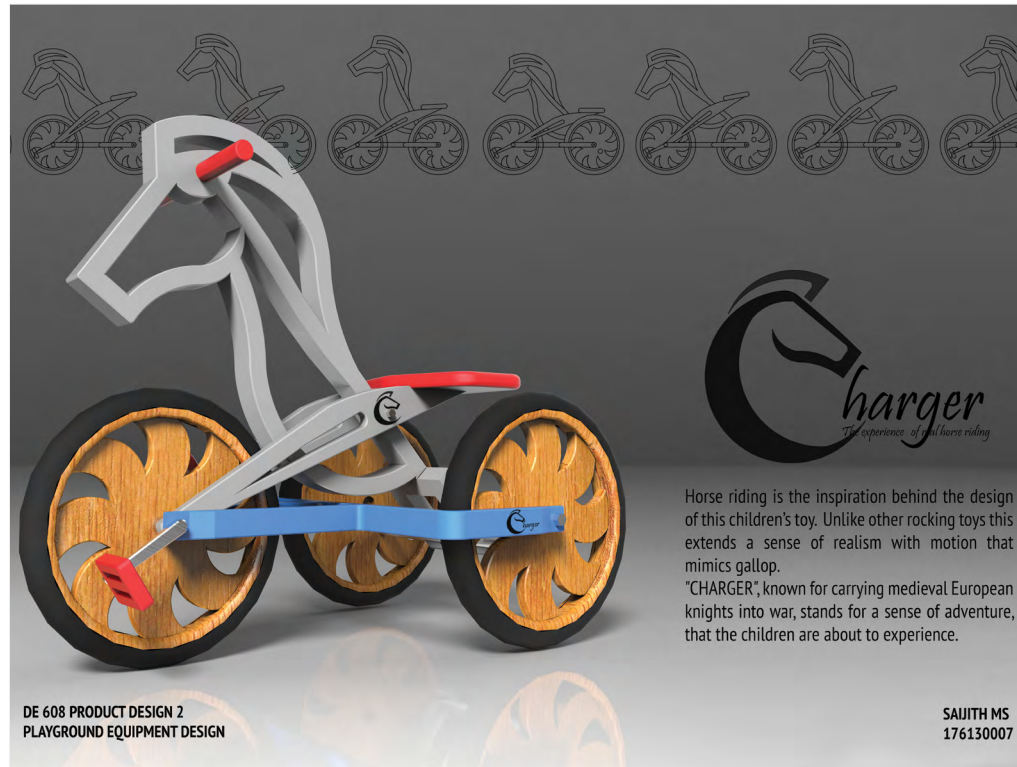
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## Poster





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## Video

Presentation Stage 1 by Saijith M S

YouTube Video Link.....

Charger by Saijith M S

YouTube Video Link.....



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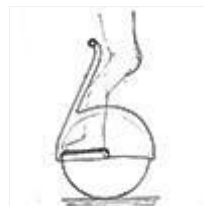
<https://dsource.in/course/indian-toy-design/students-presentations/ride-toy-group-b/arcadia-sukanta-maharana>

## Arcadia by Sukanta Maharana

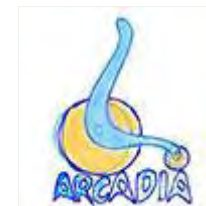
Ride-on toys are one of the most sought after toys that can help children in their physical, mental, cognitive, emotional, and social development making them better rounded individuals when they grow up. Many child developmentalists recommend getting pedal-powered ride-on toys as these can help in the development of children's motor skills.

Two- and three-wheeled ride-on toys are excellent when it comes to training kids to balance their bodies as well as observe the coordination of their various bodily movements. Bicycles, scooters, skateboards, and even tricycles all require some degree of balancing from children. This calls for a splendid understanding of spatial relations and kinaesthetic senses.

One of the most important benefits of ride-on toys is their ability to enhance the role-playing activities of children. As we all know, role-playing activities can greatly enhance the cognitive abilities of children. It gives them the opportunity to work out their problem-solving skills, their analytical skills, and their understanding of complex cause and effect relationships and their effects on certain situations.



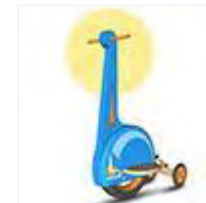
Stage 1 Presentation



Case Study - Slide Show



Poster



Video

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6B. Ride-on Toy - Group B

6Ba, 6Bb, 6Bc, 6Bd, 6Be

6Bf. Arcadia by Sukanta Maharana

6Bfi. Stage 1 Presentation

6Bfii. Case Study - Slide Show

6Bfiii. Poster

6Bfiv. Video

6Bg

7. Toys

8. Links

9. Video

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Biomimicry-inspired toys

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6Bfiii. Poster

6Bfiv. Video

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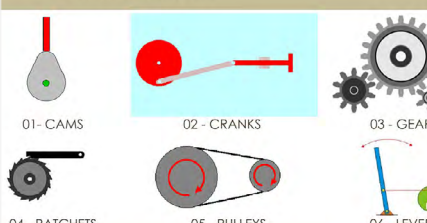

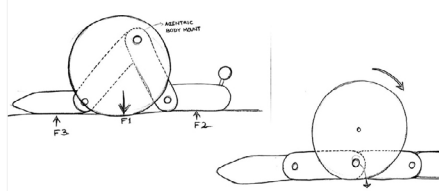
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## Stage 1 Presentation

Download:

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<p><b>PRODUCT DESIGN 2</b></p> <p>IDEATION PRESENTATION</p> <p>Sukanta maharana Roll No: 176130001</p>	<p><b>PROBLEM STATEMENT :</b></p> <p>DESIGN A PARK EQUIPMENT OR A RIDE ON EQUIPMENT FOR KIDS OF 6-12 YEARS AGE GROUP USING BIOMIMITIC APPROACH.</p>	<p><b>USER STUDY :</b></p> <p>USED ACTIVE PEOPLE WATCHING IN PUBLIC PLACES LIKE</p> <ol style="list-style-type: none"> <li>1. PLAYGROUNDS</li> <li>2. PARKS</li> <li>3. TOY STORES</li> <li>AND DATA STUDY IN</li> <li>4. BOOKS</li> <li>5. INTERNET.</li> </ol>
<p><b>TOYS IN PARKS :</b></p> <ol style="list-style-type: none"> <li>1. SLIDERS</li> <li>2. SEESAW</li> <li>3. AXIAL SLIDER WITH SHM</li> <li>4. ROTATING RING</li> <li>5. MULTI PLAY STATION</li> <li>6. SWINGS</li> <li>7. BOUNCY CASTLE</li> <li>8. ROPE SLIDER</li> <li>9. TOY TRAINS</li> <li>10. HANGING BARS</li> </ol>  <p>REFERENCE - <a href="https://dr.indiamart.com/search.mn3setBOUNCING+CASTLE">https://dr.indiamart.com/search.mn3setBOUNCING+CASTLE</a> AS ON 9th April 2018</p>	<p><b>WHAT KIDS LIKE TO DO :</b></p> <ol style="list-style-type: none"> <li>1. EXPLORES THE PHYSICAL CAPABILITY</li> <li>2. LIKE MULTY LAYERED GAMES</li> <li>3. THEY COMPARE WITH THE SUPERHEROS</li> <li>4. THEY EXPLORE, INVENT, CREAT AND CONQURE</li> <li>5. THEY TRY TO MAKE THEIR IDENTITY</li> <li>6. THEY LIKE TO LEARN NEW TOOLS LIKE MUSIC, DANCE AND SELFDEFENCE</li> <li>7. MAKE NEW FRIENDS</li> </ol> <p>REFERENCE - <a href="https://www.thetprcube.com/choosing-appropriate-toys-for-kids-4118934">https://www.thetprcube.com/choosing-appropriate-toys-for-kids-4118934</a> AS ON 3rd April 2018</p>	<p><b>DESIGN INSIGHTS :</b></p> <ol style="list-style-type: none"> <li>1. COUSHNING SAND ENABLES TO JUMP FROM HIGHTS.</li> <li>2. WINDOW FOR EXPLORATION IN THE EQUIPMENT.</li> <li>3. EXPLORING AND GETTING CONTROL OVER PHYSICAL BODY.</li> </ol>
<p><b>MECHANISMS STUDY :</b></p>  <p>01 - CAMS 02 - CRANKS 03 - GEARS 04 - RATCHETS 05 - PULLEYS 06 - LEVERS</p>	<p><b>MECHANISM STUDY OF A TOY :</b></p> <p>INCH WARM (WOODEN TOY)</p>  <p>REFERENCE - PROF. Vijay Bapat's collection AS ON 3rd April 2018</p>	<p><b>MECHANISM STUDY OF A TOY :</b></p> <p>INCH WARM (WOODEN TOY)</p> 

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Biomimicry-inspired toys

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Source:

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1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6B. Ride-on Toy - Group B

6Ba, 6Bb, 6Bc, 6Bd, 6Be

6Bf. Arcadia by Sukanta Maharana

6Bfi. Stage 1 Presentation

6Bfii. Case Study - Slide Show

6Bfiii. Poster

6Bfiv. Video

6Bg

7. Toys

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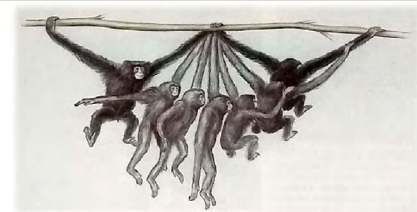
**DESIGN BRIEF :**

USING BIOMIMITIC DESIGN A COMPACT OUT DOOR RIDE-ON EQUIPMENT FOR THE KIDS OF 6-12 YEARS AGE GROUP WHICH WILL ENABLE THEM TO ENHANCE THEIR PHYSICAL BALANCE AND REFLEX ACTION BY PLAYING WITH IT.

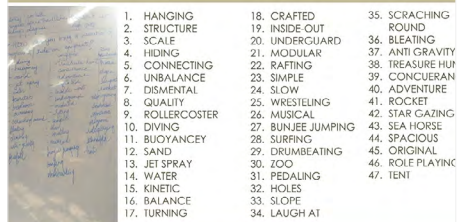
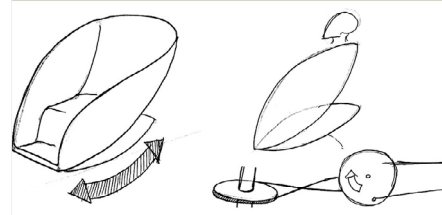
**IT MUST HAVE** – SAFETY, FLEXIBILITY IN USE, DURABILITY, WINDOW FOR EXPLORATION, INTERACTIVE FEEDBACK SYSTEM.

**IT MAY HAVE** – COLLAPSABILITY, THRILL FACTOR, THEME, MOVING COMPONENTS, MULTI LAYER STRATEGY.

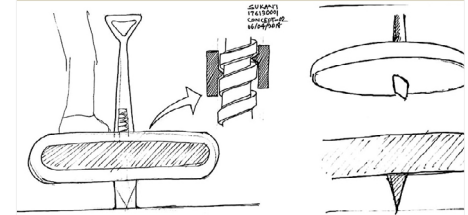
**MATERIALS** – MILD STEEL, STAINLESS STEEL, ALUMINIUM, WOOD, GFRC, PLASTIC

**INSPIRATION :**

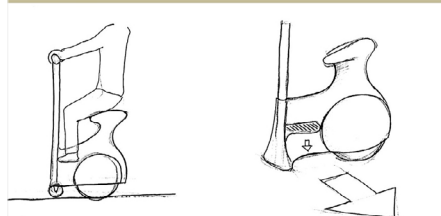
GIBBON  
REFERENCE – EXPLORING BIOMECHANICS Animals in Motion By R McNeill AlexanderAS

**BRAIN STORMING :****IDEATION :**

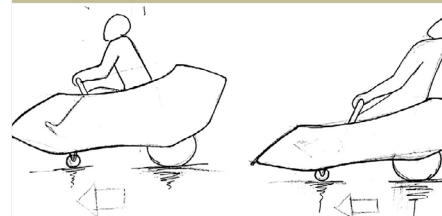
ROTATIONAL MOVEMENT BY ROCKING

**IDEATION :**

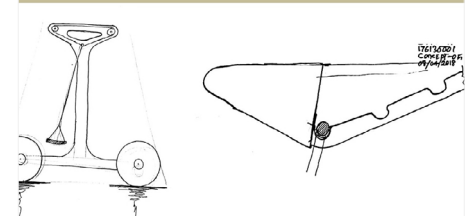
ROTATIONAL MOVEMENT BY JUMPING

**IDEATION :**

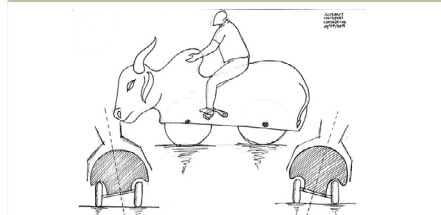
LATERAL MOVEMENT BY PADDELING

**IDEATION :**

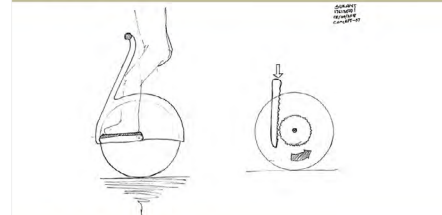
LINEAR MOVEMENT BY ROYING

**IDEATION :**

LINEAR MOVEMENT BY SWINGING

**IDEATION :**

LINEAR MOVEMENT BY PADDELING

**IDEATION :**

LINEAR MOVEMENT BY JUMPING

**DIRTY PROTOTYPE :**

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6Bf. Arcadia by Sukanta Maharana

6Bfi. Stage 1 Presentation

6Bfii. Case Study - Slide Show

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Source:

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## Case Study - Slide Show

Case Study Download:

- [Arcadia by Sukanta Maharana.....](#)
- [Arcadia by Sukanta Maharana\\_Report.....](#)

**Introduction:**

Ride-on toys are one of the most sought after toys that can help children in their physical, mental, cognitive, emotional, and social development making them better rounded individuals when they grow up. Many child development specialists recommend getting pedal powered ride on toys as these can help in the development of children's motor skills.

Two- and three-wheeled ride-on toys are excellent when it comes training kids to balance their bodies as well as observe coordination of their various bodily movements. Bicycles, scooters, skateboards, and even tricycles all require some degree of balancing from children. This calls for a splendid understanding of spatial relations and kinesthetic senses.

One of the most important benefits of ride on toys is their ability to enhance the role playing activities of children. As we all know, role playing activities can greatly enhance the cognitive abilities of children. It gives them the opportunity to work out their problem solving skills, their analytical skills, and their understanding of complex cause and effect relationships and their effects on certain situations.

**Problem statement :**

design a park equipment or a ride on equipment for kids of 6-12 years age group using biomimic approach.

**2.1 - Observation/ Active people watching :**

we used active people watching in public places like

- playgrounds
- parks
- toy stores
- and data study in
- books
- internet.

we observed the kids and their activity. Also observed parents around them, how they feel about the whole game. They were concern about their child safety. This expression varied from equipment to equipment. Observed the parameters which keeps kids safe and which makes parent feel their child is safe.

We also interviewed some parents to understand their thought and feelings about the existing products.

**2.1 – equipments in park :**

- sliders
- seesaw
- axial slider with shm
- rotating ring
- multi play station
- swings
- bouncy castle
- rope slider
- toy trains
- hanging bars

**2 - Literature study:**

The literature review carried out to know existing methodologies for the design of ride on toys. The following methodology for designing new ride on toys (based on the systematic process of design and taking into account the stages of child development) is followed:

- Recall the stages of physical, cognitive, sensor-motor, social and emotional development of children.
- Exploration of activities that may contribute to the development of the child in one or more of the spheres covered above.
- Finding metaphors that may form the basis of concepts for the creation of recreational objects.

Also some interaction is carried out with the children to have better understanding for their requirement. Apart from literature study active people watching in places like parks, playgrounds and toys is done. Also various ride on equipment available in the market is studied in detail to have a insights for future prospectus.

**2.2 What kids like to Do:**

there are certain things kids like to do as they going through a physical and mental development stage. However the unpredictable and random kids activities may be, there is a pattern driven by their physical and mental exploratory stage. Some activities are like follows...

- explores the physical capability
- like multi layered games
- they compare with the superheroes
- they explore, invent, create and conquer
- they try to make their identity
- they like to learn new tools like music, dance and self defence
- make new friends

Keeping these learning in mind we will be approaching next.

1, 2, 3, 4, 5, 6

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6Bf. Arcadia by Sukanta Maharana

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6Bfiv. Video

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## 2.2 - Field Study / Market study :

we visited many playgrounds and toy stores to study existing toys and ride-on equipments.

- playgrounds
- parks
- toy stores

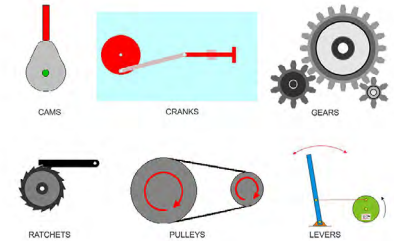
There were very old design park equipments in the parks which we used to have in our childhood. There are some new equipments available but not considerable. In the toy stores they have electric toys all over the place and almost 95% of them made out of plastic.

## 2.3 - Mechanism study :

as we needed to make moving toys, we studied many mechanisms which are the foundation of moving toy making.

- Cam mechanism
- Crank mechanism
- Gear mechanism
- Ratchet mechanism
- Pulley mechanism
- lever mechanism

We looked, observed and understood closely how these mechanisms work. Then we observed which mechanism gives which movement. Learned the strength and limitation of these mechanisms.



## 4.1 design insight :

- cushioning sand enables to jump from heights.
- window for exploration in the equipment.
- exploring and getting control over physical body.

## 4.2 Design brief :

Using biomimetic design a compact out door ride-on equipment for the kids of 6-12 years age group which will enable them to enhance their physical balance and reflex action by playing with it.

It must have – safety, flexibility in use, durability, window for exploration, interactive feedback system.

It may have – collapsibility, thrill factor, theme, moving components, multi layer strategy.

Materials – mild steel, stainless steel, aluminum, wood, GFRC, plastic.

## 5 - Design inspiration:

## Ostrich :

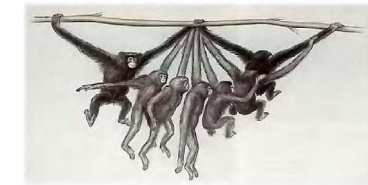
Racing on the backs of Ostriches is a sport that continues in many locations. These birds have special saddles on them. In some locations there are small buggies that are pulled by Ostriches. Since Ostrich are so intelligent they can be very easy to train.



## Gibbon :

This monkey is the naughtiest in the world. They look funny when they walk. They walk differently as they don't have tail. They are also very good in balancing in a narrow branch by spreading the long hand.

So I am looking at the naughty character as creativity and walking as a good physical balance.



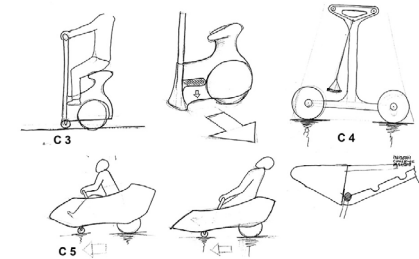
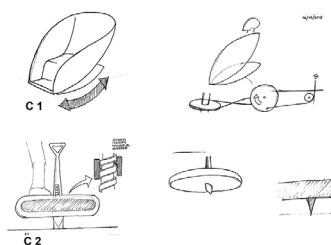
## 6 - Ideation :

## Brainstorming :



- |                  |                    |                      |
|------------------|--------------------|----------------------|
| 1. hanging       | 18. crafted        | 35. scratching round |
| 2. structure     | 19. inside-out     | 36. bloating         |
| 3. scale         | 20. under guard    | 37. anti gravity     |
| 4. hiding        | 21. modular        | 38. treasure hunt    |
| 5. connecting    | 22. rafter         | 39. concurrence      |
| 6. unbalance     | 23. simple         | 40. adventure        |
| 7. dismantle     | 24. slow           | 41. rocket           |
| 8. quality       | 25. wrestling      | 42. star gazing      |
| 9. rollercoaster | 26. musical        | 43. sea horse        |
| 10. diving       | 27. bungee jumping | 44. spacious         |
| 11. buoyancy     | 28. surfing        | 45. original         |
| 12. sand         | 29. drumbeating    | 46. role playing     |
| 13. jet spray    | 30. zoo            | 47. tent             |
| 14. water        | 31. pedaling       |                      |
| 15. kinetic      | 32. holes          |                      |
| 16. balance      | 33. algae          |                      |
| 17. turning      | 34. laugh at       |                      |

## Concept development:



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Biomimicry-inspired toys

by

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IDC, IIT Bombay

Source:

<https://dsource.in/course/indian-toy-design/students-presentations/ride-toy-group-b/arcadia-sukanta-maharana/case-study>

1, 2, 3, 4, 5, 6

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6Ba, 6Bb, 6Bc, 6Bd, 6Be

6Bf. Arcadia by Sukanta Maharana

6Bfi. Stage 1 Presentation

6Bfii. Case Study - Slide Show

6Bfiii. Poster

6Bfiv. Video

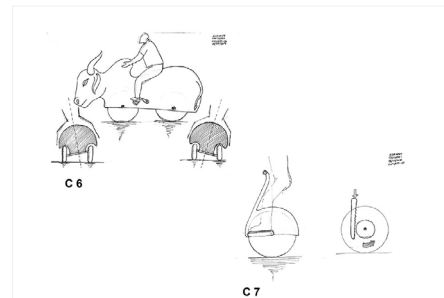
6Bg

7. Toys

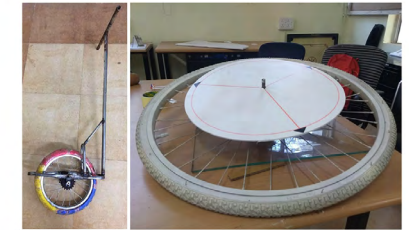
8. Links

9. Video

10. Contact Details



7 - Dirty prototype and POC :



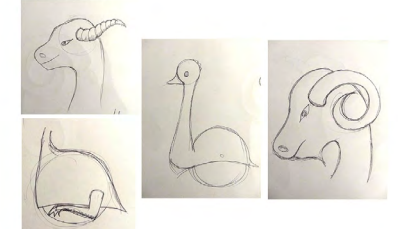
8 - concept evaluation :

Selection criteria	C1	C2	C3	C4	C5	C6	C7
Ease of handle	2	4	3	1	3	2	3
Ease of use	4	3	3	4	3	3	4
Number readability	3	3	4	3	2	2	4
Does metering	2	2	3	2	3	2	3
Load handling	4	2	4	3	4	4	5
Ease of making	2	3	4	2	3	3	4
portability	1	3	3	1	3	2	5
<b>Total</b>	<b>18</b>	<b>20</b>	<b>24</b>	<b>16</b>	<b>21</b>	<b>18</b>	<b>28</b>

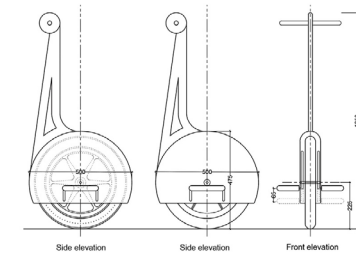
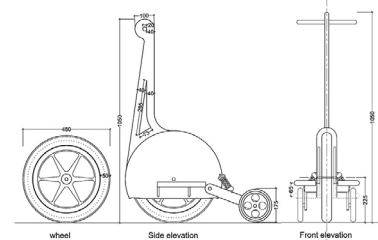
-C1, C2, C3.....Cn are concepts and we marked them out of 5.  
-Here I am selecting c3 and c7. I will combine these two concepts to make final concept

9. Final model :

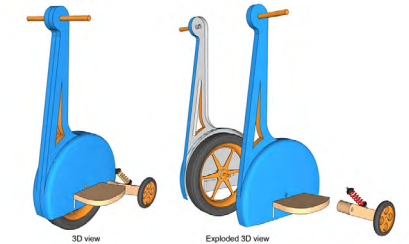
9.1 Form variation



9.2 product dimension:



9.3 3d Model:



9.4 colour variations:



9.5 Branding :

9.5.1 Brand naming :

I was looking for to name it adventure but known words spoil the interest and curiosity, so ARCADIA, a Spanish word meaning *Adventurous*. Unknown words make people curious without changing the meaning.

9.5.2 About Arcadia:

Arcadia manufactures beautiful and functional trikes that your child can cherish forever. With a passion and experience with child ergonomics, the company dedicates itself to making trikes of unique styles and bold colours built for your child to use and enjoy. With Arcadia, we assure a sturdy, secure, safe and of course extremely fun to use trike.

9.5.3 logo :



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Biomimicry-inspired toys

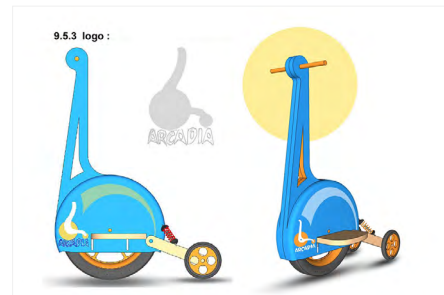
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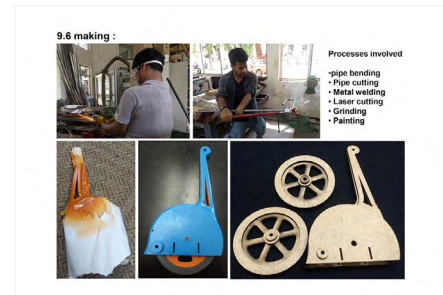
Source:

<https://dsource.in/course/indian-toy-design/students-presentations/ride-toy-group-b/arcadia-sukanta-maharana/case-study>



## 11 References :

- <https://dr.indiamart.com/bowen/mo2asbouncing+castle> as on 09th april 2018
- <https://www.dsource.com/choosing-age-appropriate-toys-for-kids-4118934> as on 3rd april 2018
- Prof. Vijay Bapat's collection as on 3rd april 2018
- Exploring biomechanics animals in motion by r Monell Alexander
- google



## 10 bill of Material:

Sl.no	Name of the part	Material	Manufacturing process
1.	Handle Bar	Aluminum tube	CNC Bending
2.	Hand Grip	EPDM rubber (ethylene propylene diene monomer rubber)	Injection molding
3.	Frame	Aluminum Tube	Extrusion, Tig welding
4.	Body	FRP	Resin transfer molding
5.	Gears	Brass	Honing
6.	Tyre	Synthetic rubber	Curing Press
7.	Wheel	Magnesium	Casting, Milling
8.	Suspension		
9.	Foot Pedals	Aluminium	Casting
10.	Axle	Steel	Water jet

1, 2, 3, 4, 5, 6

6A. Push Toy - Group A

6B. Ride-on Toy - Group B

6Ba, 6Bb, 6Bc, 6Bd, 6Be

6Bf. Arcadia by Sukanta Maharana

6Bfi. Stage 1 Presentation

6Bfii. Case Study - Slide Show

6Bfiii. Poster

6Bfiv. Video

6Bg

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## Poster



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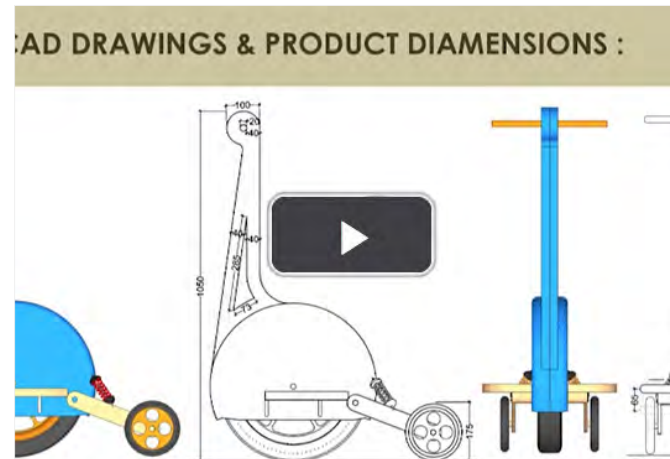
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## Video

Presentation Stage 1 by Sukanta Maharana



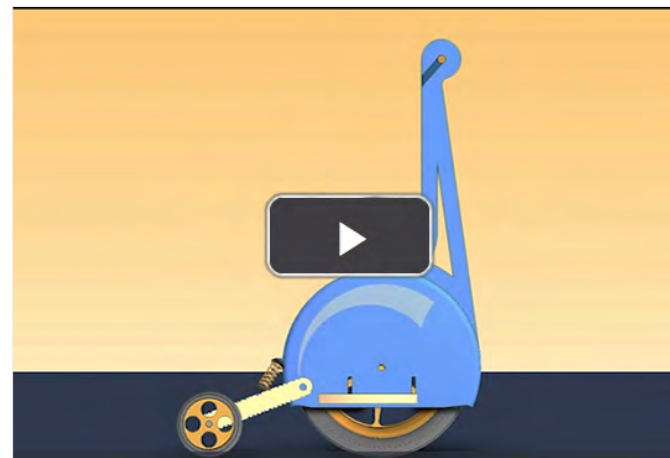
YouTube Video Link.....

Final Presentation by Sukanta Maharana



YouTube Video Link.....

Arcadia by Sukanta Maharana



YouTube Video Link.....

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6Ba, 6Bb, 6Bc, 6Bd, 6Be, 6Bf

6Bg. Hornsby by Vinod Louis J. Swamy

6Bgi. Stage 1 Presentation

6Bgii. Case Study - Slide Show

6Bgiii. Poster

6Bgiv. Video

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## Hornsby by Vinod Louis Joseph Swamy

The aim of the project is to design a playful and engaging ride-on for children aged 6-10 for indoor and outdoor usage by using biomimetic as a tool for inspiration.

### Project Brief

1. The device should have dynamic components that are easily operable by the children while riding.
2. It should evoke a sense of thrill for the children by mimicking the motion of the animal.
3. It should appeal to either of the genders and to the older segment of the target user group.



Stage 1 Presentation



Case Study - Slide Show



Poster



Video

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6Bgi. Stage 1 Presentation

6Bgii. Case Study - Slide Show

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6Bgiv. Video

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## Stage 1 Presentation

Download:

- [Hornsby\\_Stage 1 Presentation\\_by Vinod Louis Joseph Swamy.....](#)

product design 2 | stage presentation  
concept design

vinod louis joseph swamy  
176130013

### design brief

#### project statement:

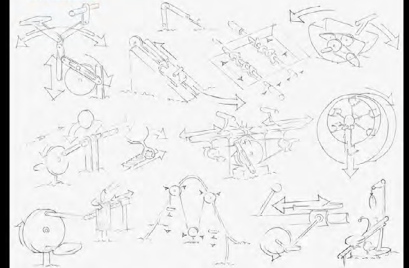
To design a playful ride-on for children aged 5-10 for indoor and outdoor usage.

#### project brief:

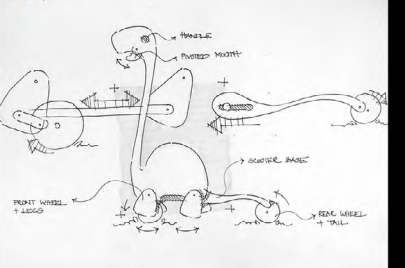
The device should have dynamic components that are engaging and easily operable by the children while riding.

It should evoke a sense of thrill for the children by mimicking the motion of the animal.  
The ride-on should have a theme using colours and motifs to better relate to the Indian context.

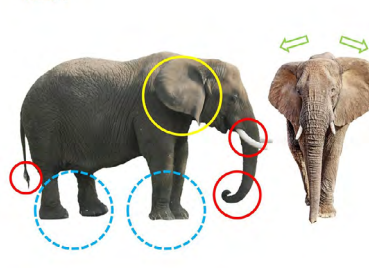
### initial sketches



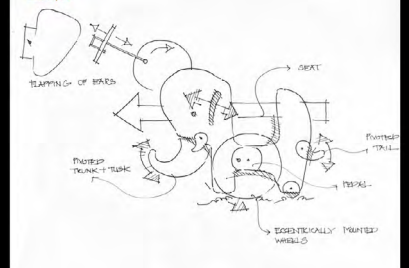
### concept 1



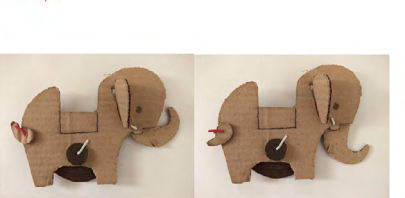
### concept 2



### concept 2



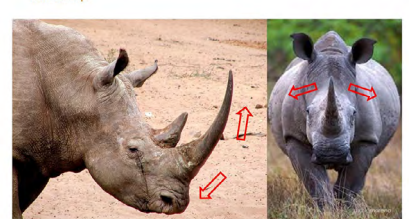
### concept 2



### concept 2



### final concept





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6Bg. Hornsby by Vinod Louis J. Swamy

6Bgi. Stage 1 Presentation

6Bgii. Case Study - Slide Show

6Bgiii. Poster

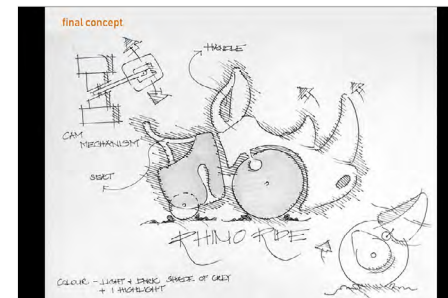
6Bgiv. Video

7. Toys

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### selection criteria

1. Mimicking the movements of the selected animal.
2. Effecting thrill for the user riding the equipment.
3. Possibility for group activities.
4. Apt for the child age group of 5-10 years.
5. Appeal to either or both of the genders.
6. Simplicity and clarity of mechanism used

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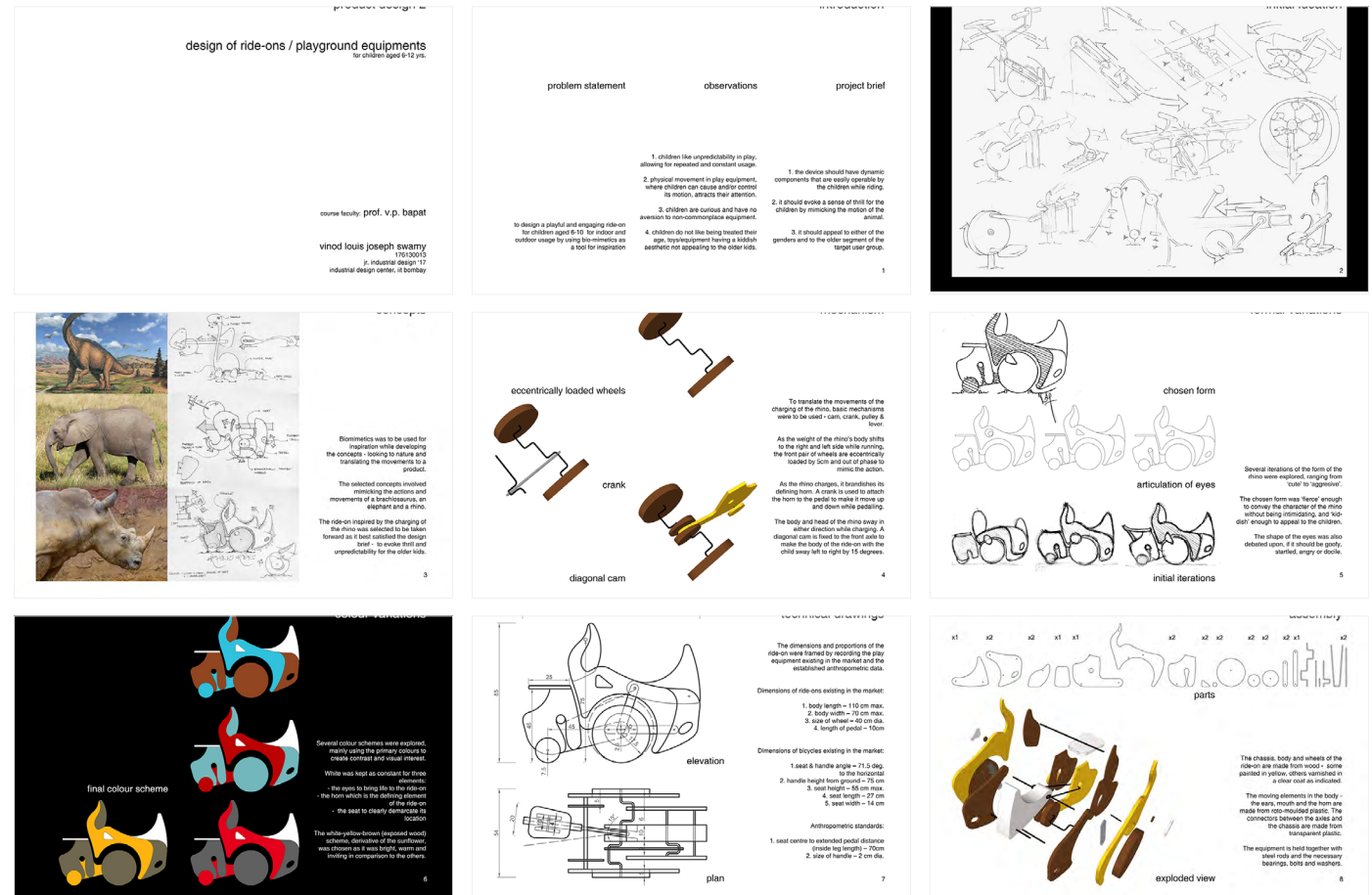
Source:

<https://dsource.in/course/indian-toy-design/students-presentations/ride-toy-group-b/hornsby-vinod-louis-joseph-swamy-1>

## Case Study - Slide Show

Case Study Download:

- [Hornsby\\_by Vinod Louis Joseph Swamy.....](#)
- [Hornsby\\_by Vinod Louis Joseph Swamy\\_Report.....](#)



1, 2, 3, 4, 5, 6

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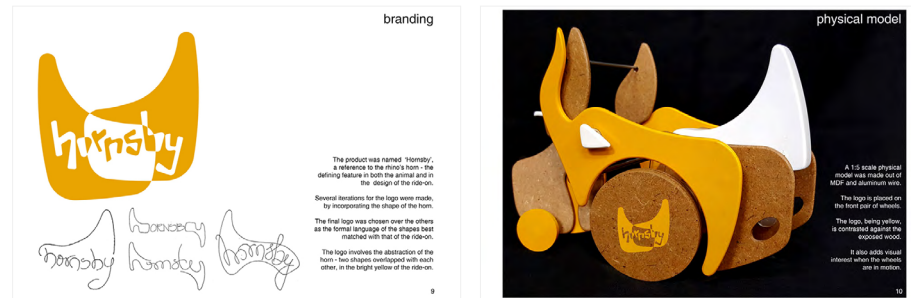
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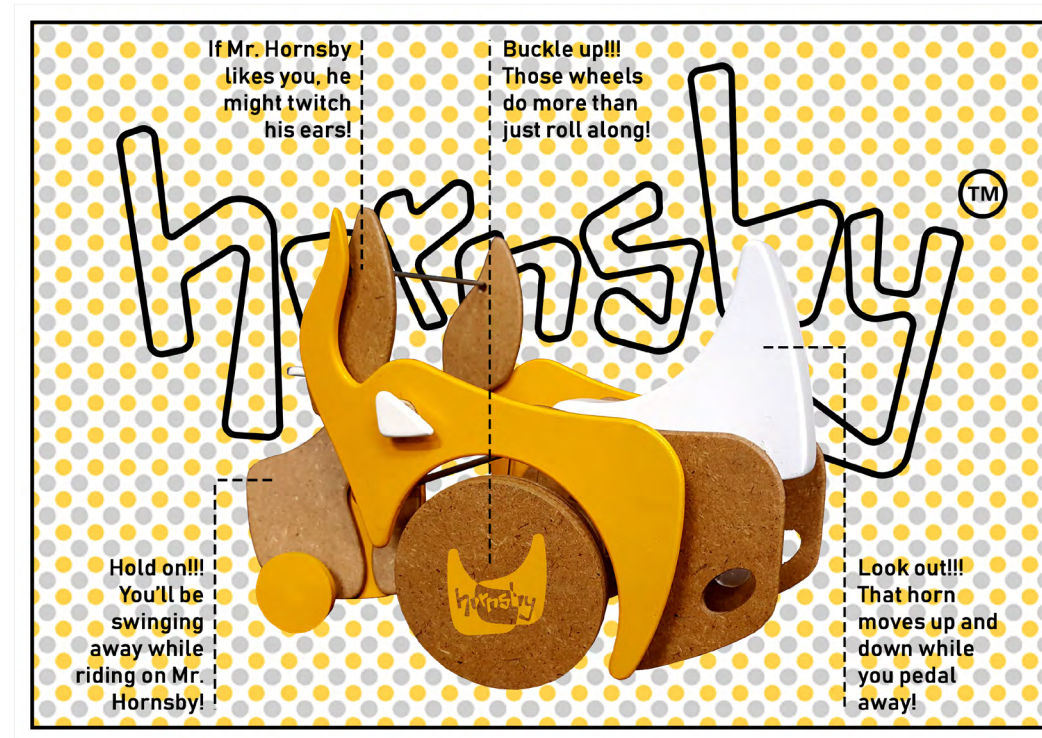
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## Poster



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## Video

Presentation Stage 1 by Vinod Louis Joseph Swamy

YouTube Video Link.....

Hornsby by Vinod Louis Joseph Swamy

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<https://www.dsource.in/course/indian-toy-design/toys>

1. Introduction
2. Theme of the Course
3. Difference Between Idea and Concept
4. Product Design Insights
5. Understanding Toy Mechanism
6. Students Presentations
7. Toys
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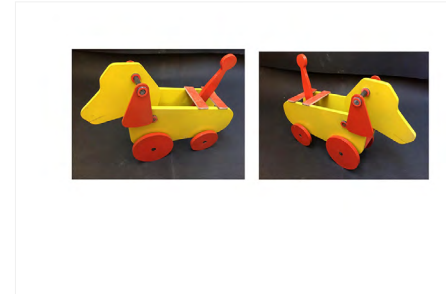
## Toys

The course culminated in the creation of innovative toys that seamlessly integrated biomimetic principles with playful design. The journey from observation to product involved critical thinking and constant refinement, enabling students to design toys that were not only inspired by nature but also supported children's physical and cognitive development. In conclusion, the course provided an enriching experience that went beyond traditional design thinking. By embracing biomimicry, students learned to harness nature's wisdom, resulting in sustainable, fun toys. They gained a deep understanding of how integrating nature into product design leads to functional, environmentally harmonious innovations.

### Push Toy - Group A



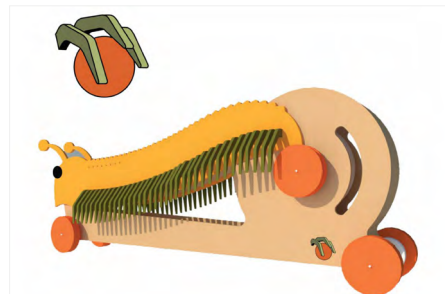
Catchy by Anushree Banerjee



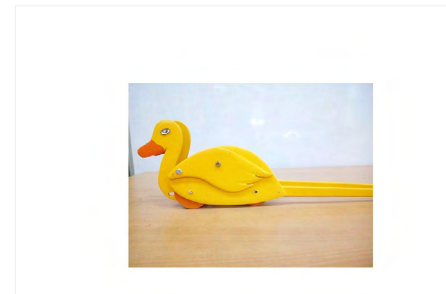
Roxy by Hari



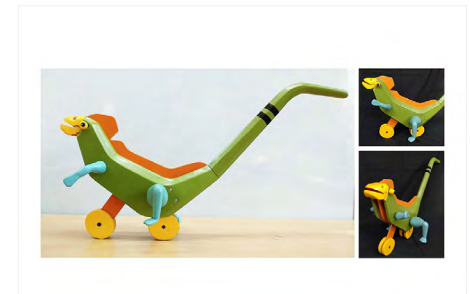
Pakhi by Minal Agarwal



Rollerpede by Mridul Jain



Totter by Nikita Fatarpekar



Waliz by Nirmal P J

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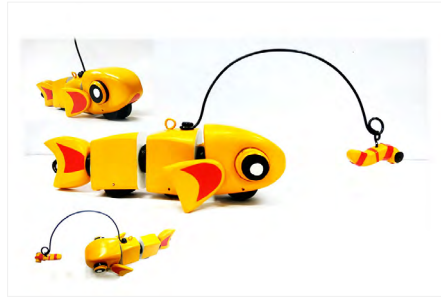
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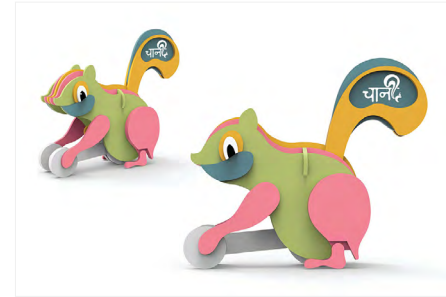
Source:

<https://www.dsource.in/course/indian-toy-design/toys>

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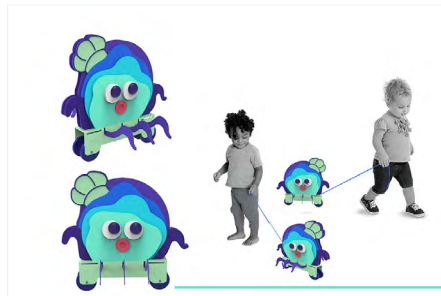
Toto by Rajat



Chani by Aamod Narkar



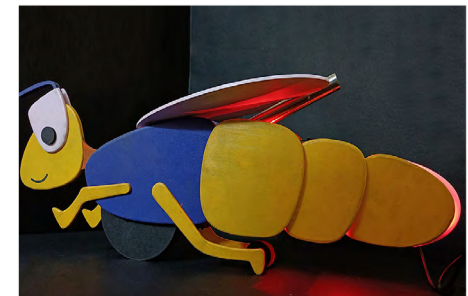
Rolly by Ashuj Chawda



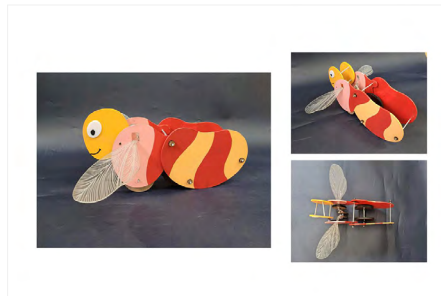
Chef Olie by Athira E



Sting Ray by Infant Bibin I



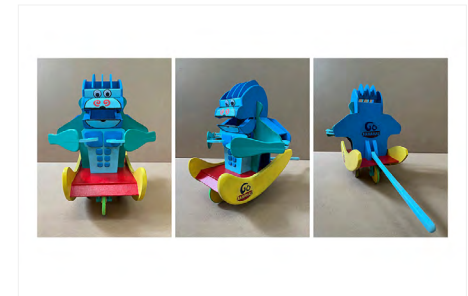
Akira by Mohammed Hazique Kola



Buzz by Mugdha Dengle



Tooti by Naiga Catherine



Go Bananas by Parth Rathod

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by

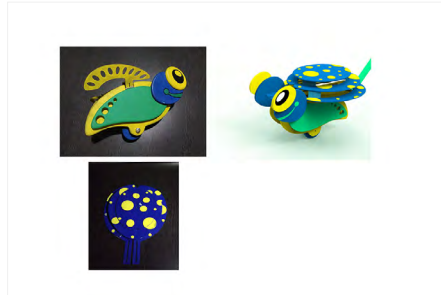
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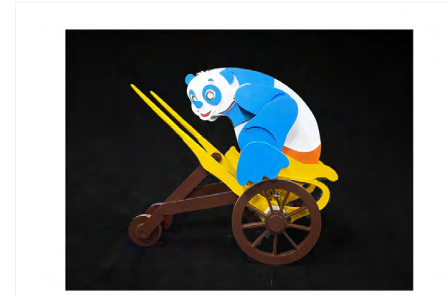
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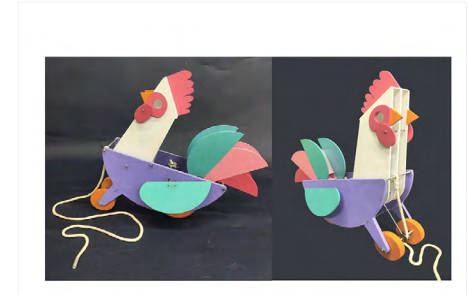
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Buba by Prathmesh Pedamkar



Pambo by Sagar D Dabherao



Muro by Shivani M



Cunth by Snehal Gaikwad



Taco by Susovan Gupta



Hooti by Uppili Nithin Soorya B



Piku by Vaibhav Watile



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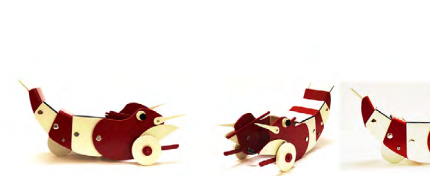
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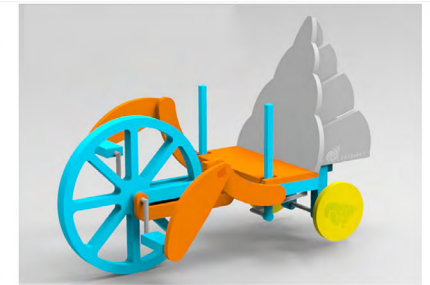
### Ride-on Toy - Group B



Blaze by Apurba Mondal



Bobster by Archana



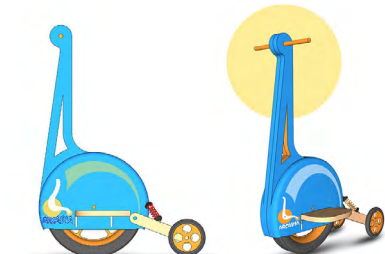
Crabuggy by Maddu Shravan Murali



Teerox by Minu



Charger by Saijith MS



Arcadia by Sukanta Maharana



Hornsby by Vinod Louis Joseph Swamy

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## Links

### References:

#### Push Toy - Group A

##### Roxy

- Cross, N., Naughton, J. and Walker, D., 1981. Design method and scientific method. Design studies, 2(4), pp.195-201.

- Research Methods for Product Design, Alex Milton, Paul Rodgers, Laurence King Publishing, 2013, ISBN 1780673027.

- <http://www.beautifulbeasties.com/learning-to-speak-dog-part-4-reading-a-dogs-body>

##### Totter

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##### Chef Olie

- <https://www.youtube.com/watch?v=ebeNeQFUMa0>
- <https://www.youtube.com/watch?v=abRPaXgJGQg>
- <https://www.youtube.com/watch?v=QFoskwfaRI8>
- [https://www.youtube.com/watch?v=OA\\_xLQGaQn4&t=23s](https://www.youtube.com/watch?v=OA_xLQGaQn4&t=23s)
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- <https://www.verifiedmarketresearch.com/product/toys-market/>
- <https://www.imarcgroup.com/indian-toys-market#:~:text=The%20Indian%20toys%20market%20reached,12.6%25%20during%202022%2D2027>

##### Akira

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- <https://in.pinterest.com/loiscabinlover/fireflies/>
- <https://www.pngall.com/firefly-png/download/57810>
- [https://www.kindpng.com/imgv/TRmRTJ\\_uttarakhand-insects-firefly-firefly-bug-hd-png-download/](https://www.kindpng.com/imgv/TRmRTJ_uttarakhand-insects-firefly-firefly-bug-hd-png-download/)

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Biomimicry-inspired toys

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- <https://www.imagebee.org/tv-shows/firefly/>
- <https://in.pinterest.com/pin/851672979516297718/>
- <https://unsplash.com/s/photos/bull-fight>
- <https://wallpapersafari.com/wallpaper-bull/>
- <https://www.pinterest.co.uk/mjld1966/charging-bull/>
- <https://wifflegif.com/tags/14107-giraffe-gifs?page=5>
- <https://depositphotos.com/stock-photos/giraffe.html>
- <https://mocah.org/xfsearch/alt/giraffe/>
- <https://wall.alphacoders.com/big.php?i=277009>
- <https://www.shutterstock.com/video/search/firefly>
- [https://www.youtube.com/watch?v=CogHulTLH2g&ab\\_channel=ScienceInsider](https://www.youtube.com/watch?v=CogHulTLH2g&ab_channel=ScienceInsider)
- [https://www.youtube.com/watch?v=WFKGPT0gKiM&ab\\_channel=TechInsider](https://www.youtube.com/watch?v=WFKGPT0gKiM&ab_channel=TechInsider)

### Go Bananas

- <https://i.pinimg.com/736x/51/b5/ff/51b5ffa2dbbd9c42ec4083199cade06d.jpg>
- <https://cff2.earth.com/uploads/2019/05/21190400/deep-sea-anglerfish.jpg>
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### Ride-on Toy - Group B

#### Teerox

- <https://www.lifetime.com/swing-set-accessories>
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- <http://www.nwlink.com/~donclark/perform/brainstorm.html>
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- <https://www.arrowheadinc.com/fiberglass-manufacturing-processes/>
- <https://www.youtube.com/watch?v=gdmZI-jqJG0>

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Arcadia

- <https://dir.indiamart.com/search.mp?ss=bouncing+castle> as on 9th april 2018
- <https://www.thespruce.com/choosing-age-appropriate-toys-for-kids-4118934> as on 3rd april 2018
- Prof. Vijay bapat's collection as on 3rd april 2018
- Exploring biomechanics animals in motion by r Mcneill Alexanderas
- google

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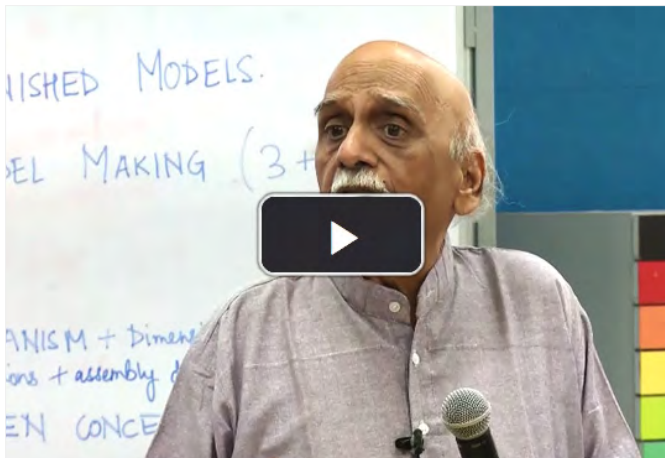
## Videos



Introduction - User Centric Product Design



Theme of the Course - Toy Design Task



Difference Between Idea and Concept



Product Design Insights

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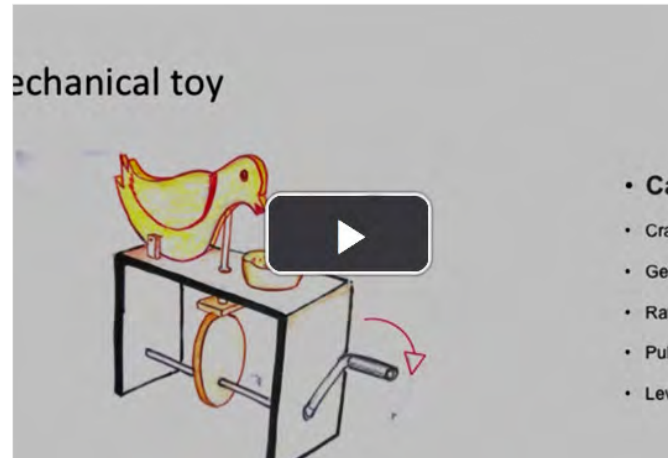
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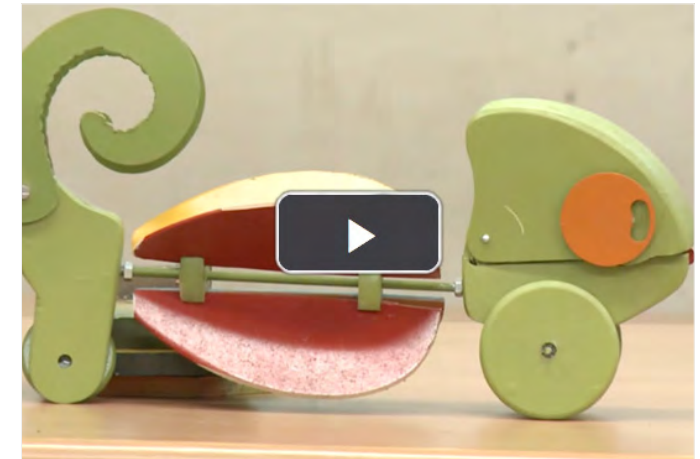
Understanding Toy Mechanism



Presentation Stage 1  
by Anushree Banerjee



Toy Design Mechanism  
by Anushree Banerjee



Catchy  
by Anushree Banerjee



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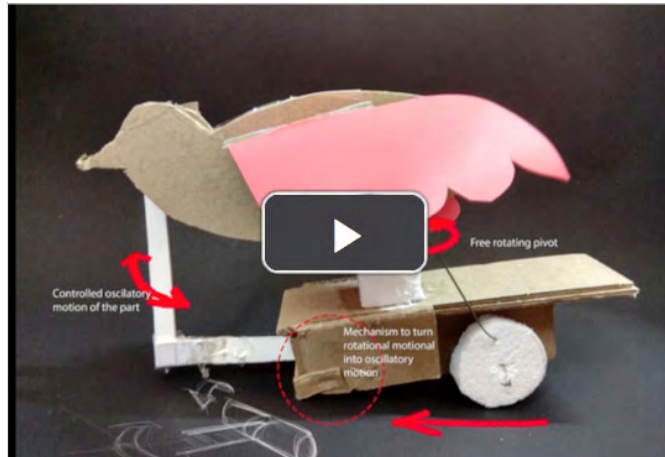
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Presentation Stage 1  
by Hari



Final Presentation  
by Hari



Presentation Stage 1  
by Minal Agarwal



Toy Design Mechanism  
by Minal Agarwal

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Toy Design Mechanism  
by Nikita Fatarpekar



Totter  
by Nikita Fatarpekar



Presentation Stage 1  
by Nirmal P J



Toy Design Mechanism  
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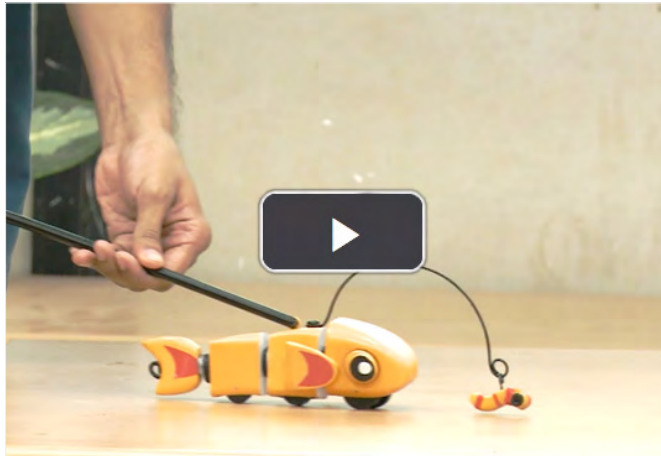
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Waliz by Nirmal P J



Presentation Stage 1  
by Rajat



Final Presentation  
by Rajat



Chani  
by Aamod Narkar

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Rolly  
by Ashuj Chawda



Akira  
by Mohammed Hazique Kola



Tooti  
by Naiga Catherine



Go Bananas  
by Parth Rathod



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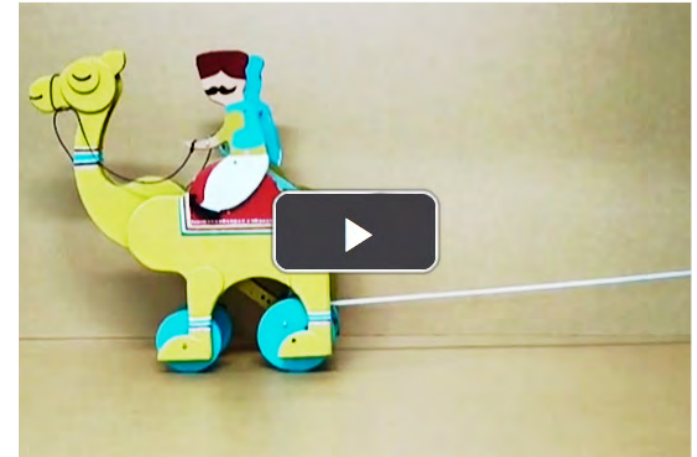
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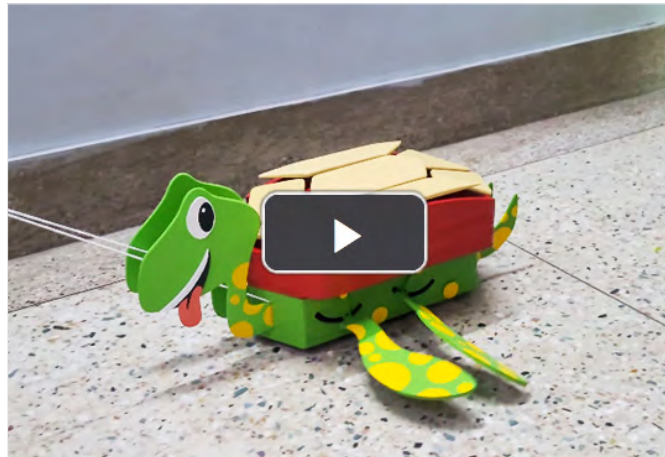
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Pambo  
by Sagar D Dabherao



Cunth by Snehal Gaikwad



Taco by Susovan Gupta



Hooti  
by Uppili Nithin Soorya B



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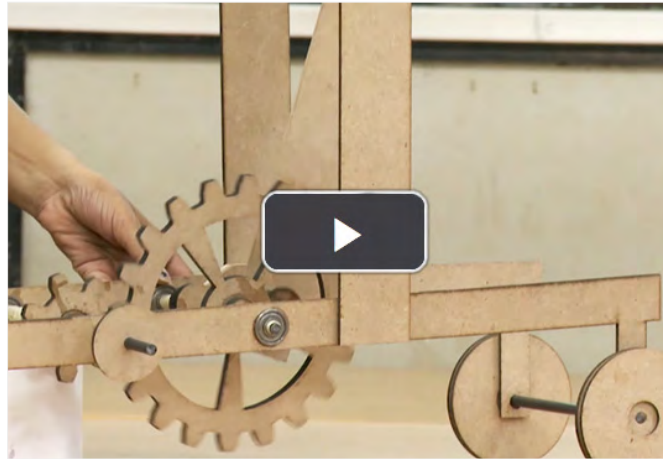
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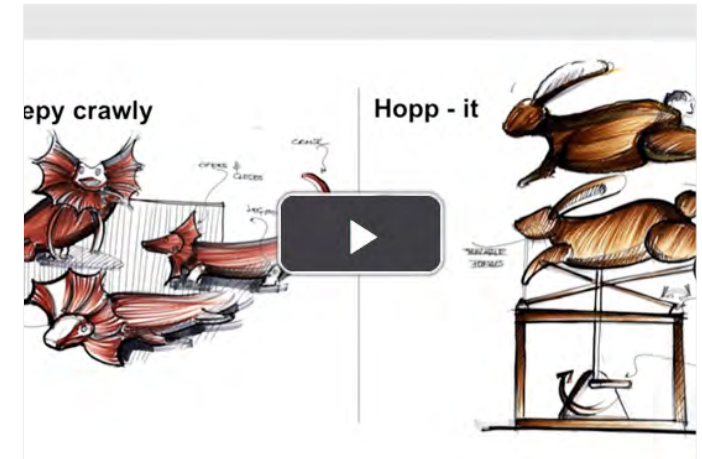
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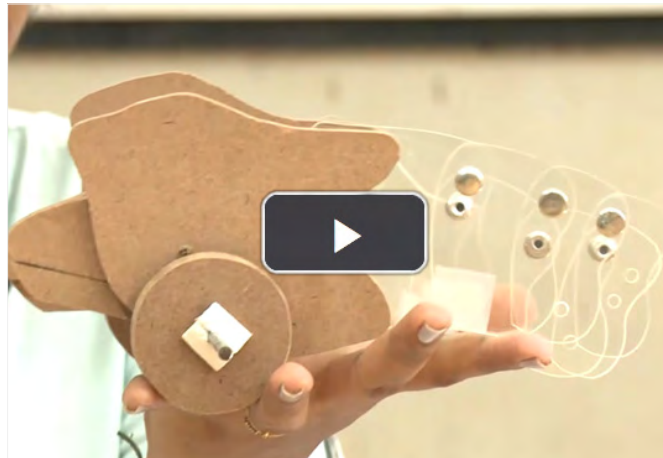
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Final Presentation  
by Apurba Mondal



Presentation Stage 1  
by Archana S



Toy Design Mechanism by Archana S



Bobster  
by Archana S

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Final Presentation  
by Maddu Shravan Murali



Presentation Stage 1  
by Minu



Toy Design Mechanism  
by Minu



Teerox  
by Minu

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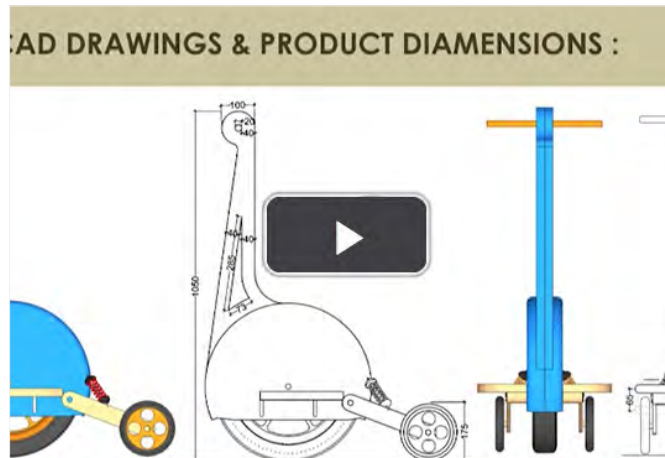
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Presentation Stage 1  
by Saijith M S



Charger  
by Saijith M S



Presentation Stage 1  
by Sukanta Maharana



Final Presentation  
by Sukanta Maharana



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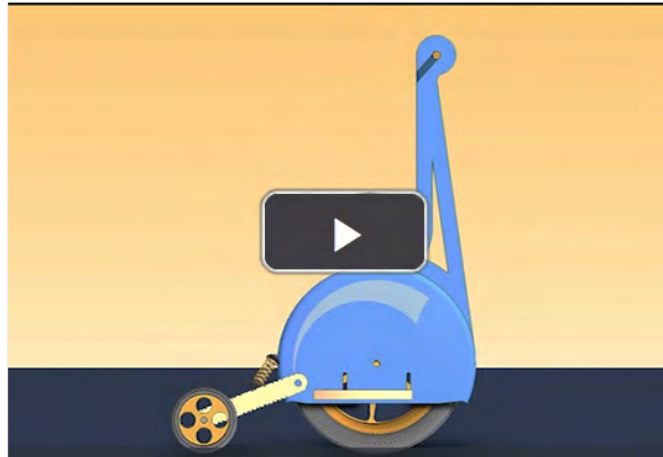
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Arcadia  
by Sukanta Maharana



Hornsby  
by Vinod Louis Joseph Swamy



Presentation Stage 1  
by Vinod Louis Joseph Swamy



Students Presentations and Feedback



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## Contact Details

This documentation for the course was done by Professor Vijay P Bapat, faculty at **IDC, IIT Bombay**.

You can get in touch with him at [bapat\[at\]iitb.ac.in](mailto:bapat[at]iitb.ac.in)

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Project e-kalpa

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IIT Bombay

Powai

Mumbai 4000 076

India

Phone: 091-22-2159 6805/ 091-22-2576 7802

Email: [dsource.in\[at\]gmail.com](mailto:dsource.in[at]gmail.com)

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