



Group 9: Hockey Beaver

Presentation Overview

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1. Introduction and Background Information

Goal of the Project:

To develop a 3D printed puzzle

- Must be unique and original
- Must include a motif of at least one Canadian animal/plant

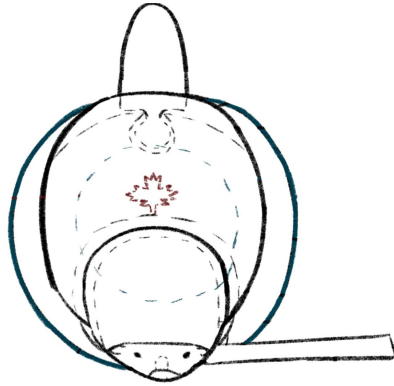
Original Ideas:

Goose, arctic fox, racoon, wolf spider

- Chose to focus on beaver

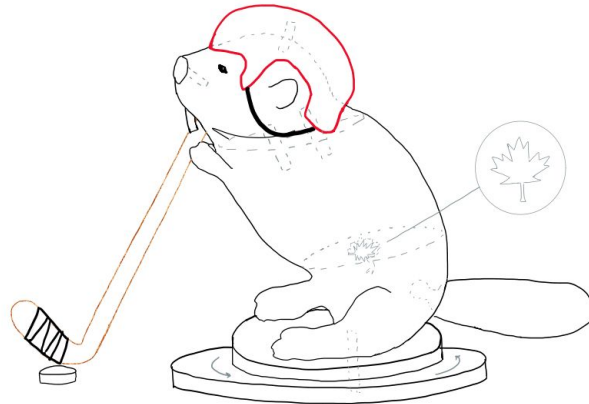


2. Brainstorming Process



Criteria:

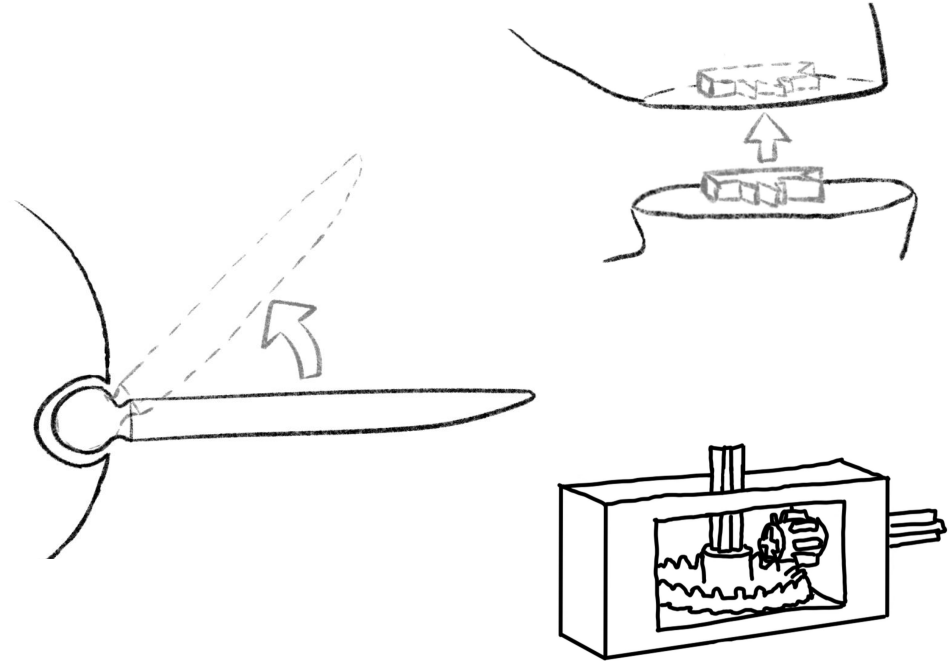
- Under 12 hour print time
- Creative design
- Multiple part puzzle



Brainstorming Process

Initial Unique Parts:

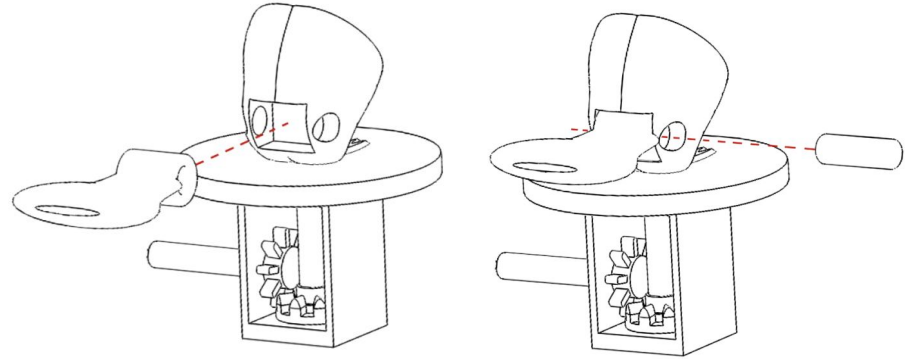
- Ball and socket joint tail in lower body
- Maple leaf pin between middle and lower body
- Rotating base to spin the beaver



3. First Design Iteration

Solidworks Parts Creation:

- Removed many pins, and swapped joint iterations
- Changed ball and socket joint



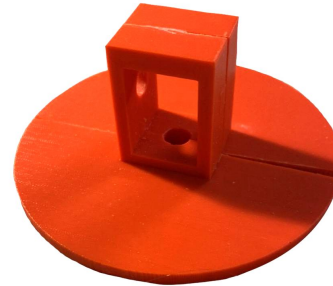
Solidworks Challenges:

- Lack of consistent dimensioning: scaling of pieces was not standardized
- Original design was too large (>12h print time)
 - Scaling was modified multiple times
 - Original base was printed in two pieces

4. Second Design Iteration

Reprinting Process

- Base was reprinted as a whole piece
- Beaver to base connection pin re-printed
- Head pin reprinted



First iteration



Second iteration

Post Print Changes

- Filing for smoother fit
 - Round pins and hockey stick
- Painted exterior surfaces for aesthetics



Base
layer [2]



Fine
details [3]

5. Final Product

Unsolved Puzzle



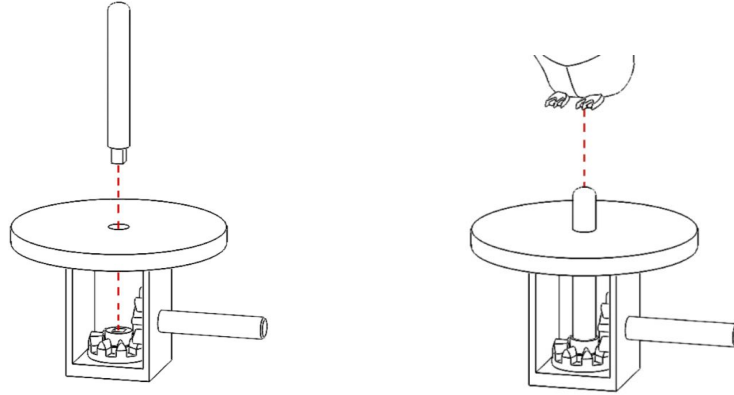
Solved Puzzle



Final Product: Movable Features

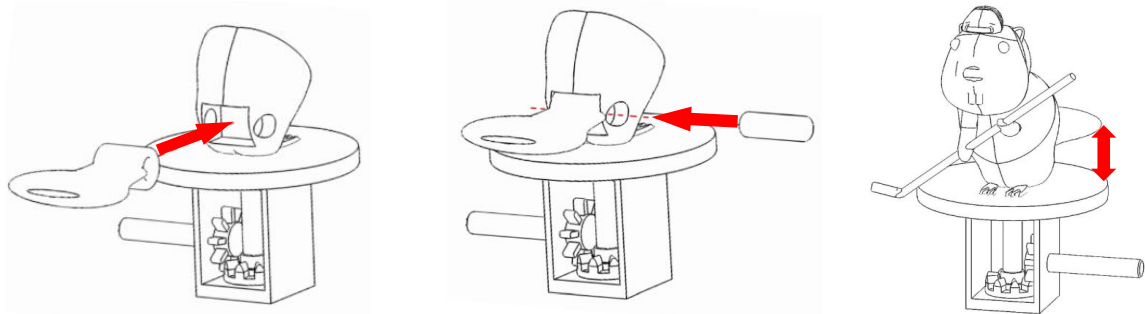
First Feature:

- Gears for beaver to spin on its base (shoots puck)



Second Feature:

- Pin for tail that allows for movement up and down



6. Conclusions

Lessons Learned:

- More experience with Solidworks features
- Experience with printing techniques

Future Iteration Ideas:

- Attempt ball and socket joint tail
- Improve and adjust pin fit (less filing)
- Larger base so beaver can hit a puck
- Global variables



Citations

[1] "Eurasian Beaver." Wikipedia. https://en.wikipedia.org/wiki/Eurasian_beaver (accessed October 16, 2023).

[2] "12 oz. Satin Nutmeg General Purpose Spray Paint." Home Depot. <https://www.homedepot.com/p/Rust-Oleum-Painter-s-Touch-2X-12-oz-Satin-Nutmeg-General-Purpose-Spray-Paint-334076/307244921#overlay> (accessed November 24, 2023).

[3] "Acrylic Paint Bottle Set 10PC (Assorted Colours) - Case of 24." Dollarama. <https://www.dollarama.com/en-ca/p-acrylic-paint-bottle-set-10pc-assorted-colours/3013709> (accessed November 24, 2023).