



# 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:

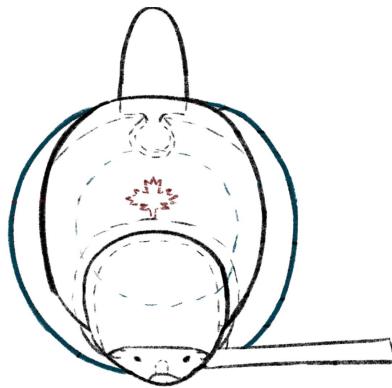
Goose, arctic fox, racoon, wolf spider

- Chose to focus on beaver



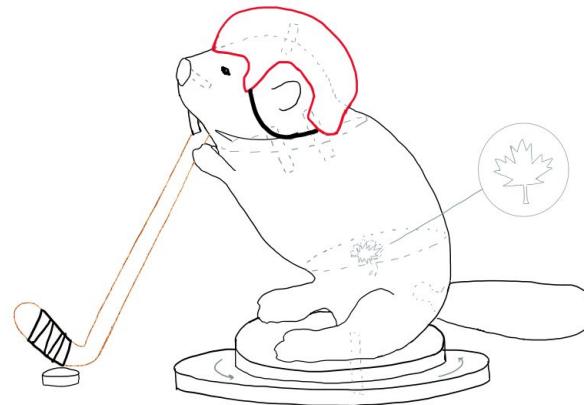
[1]

## 2. Brainstorming Process



### Criteria:

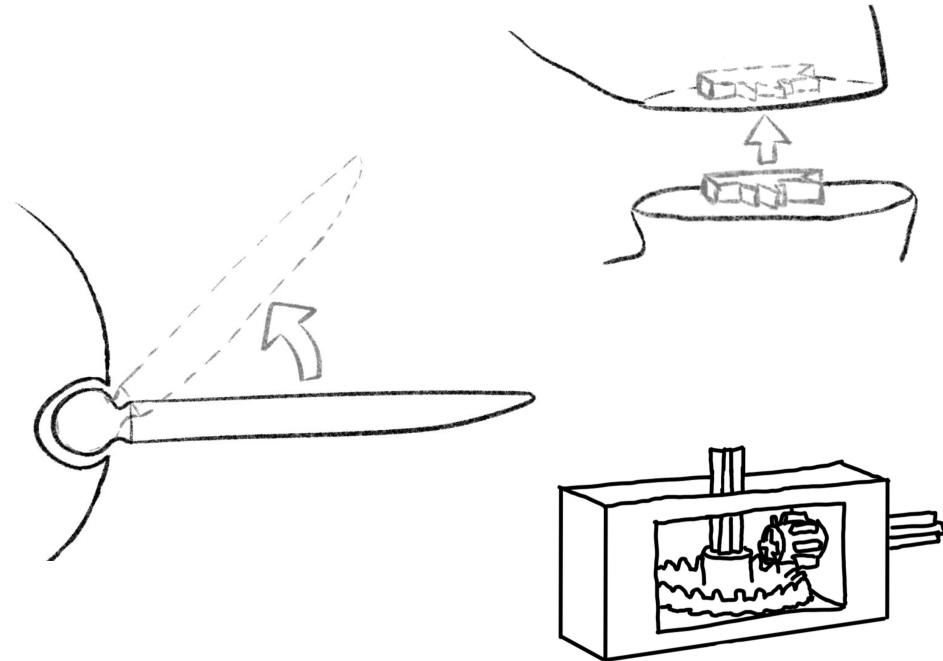
- Under 12 hour print time
- Creative design
- Multiple part puzzle



# 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



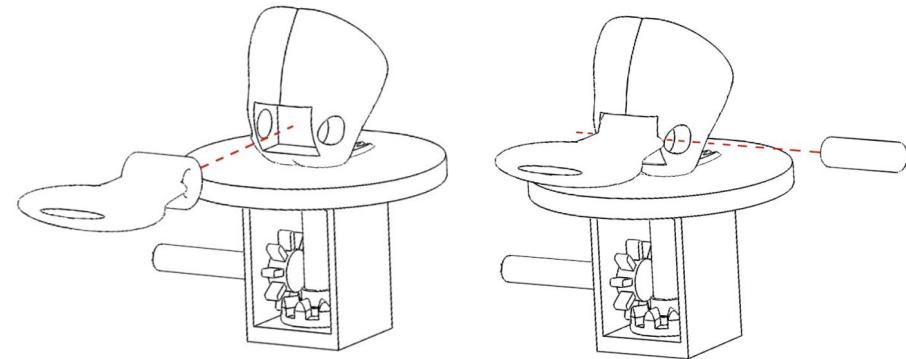
### 3. First Design Iteration

#### Solidworks Parts Creation:

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

#### Solidworks Challenges:

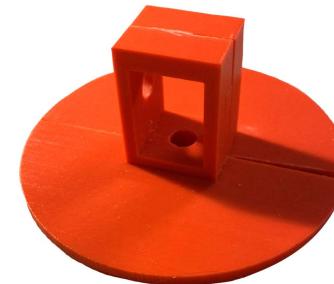
- Lack of consistent dimensioning: scaling of pieces was not standardized
- Original design was too large (>12h print time)
  - Scaling was modified multiple times
  - Original base was printed in two pieces



# 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]



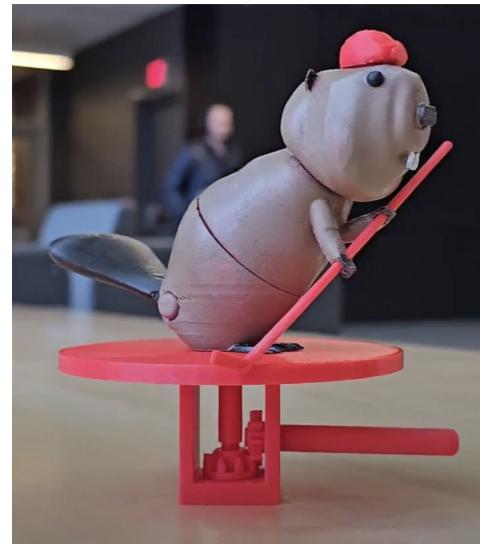
Fine details [3]

# 5. Final Product

Unsolved Puzzle



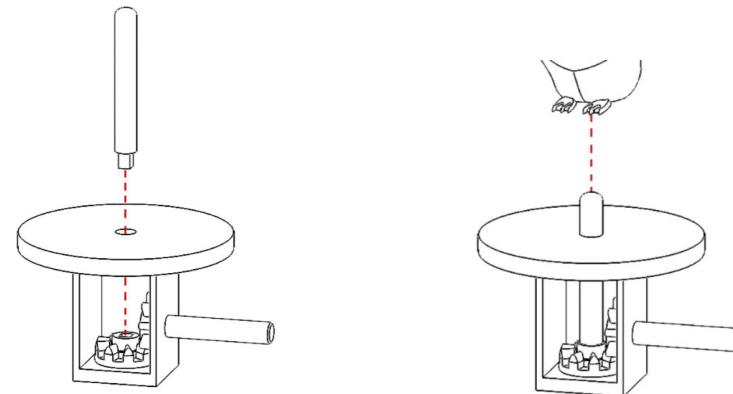
Solved Puzzle



# Final Product: Movable Features

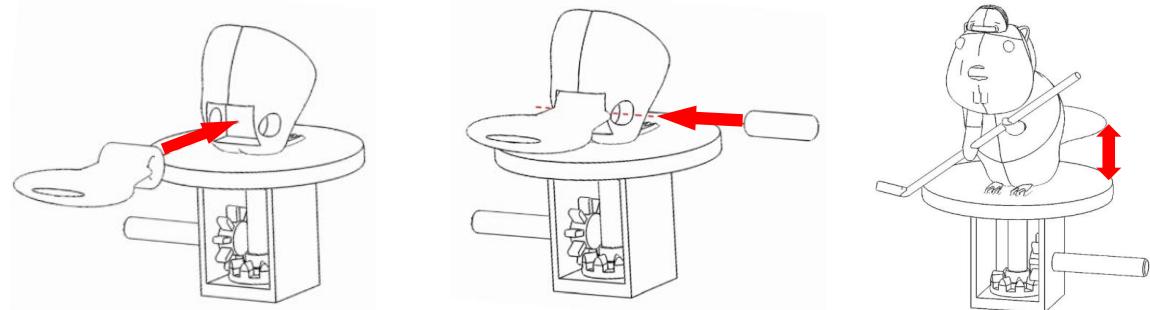
## First Feature:

- 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](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).