Requirements:
4 minutes or less
No editing
Highlight key characteristics of design in model

Order of go:
Introduce each member

- Name
- Grade
- School
- Name of invention - Feeder Heater
- How did we find this problem?
- Birdwatching has become a frequent habit for our households, and we've noticed during the colder months that bird seed freezes and creates a mess and makes it harder for the birds to eat. My dad always is upset about the condition of his feeder and wishes that there was one better for the birds and for his convenience.

...create our own birdfeeder that is both convenient for the birds and the owner of the feeder.

- We are all former environmental science students and we love watching the different bird species fly by our backyards. We wanted to make our bird feeders more appealing during the colder months. The major obstacle with this is that the food freezes and the birds' feet get cold. So, we thought to put a heater below the food and right next to where the birds will land. It keeps the feet toasty and food roasty.
  The design choice of power from an extension cord from the house provides power not dependent on the weather or interference from bird feces.

How did we design it, how did we choose what materials to use

We decided on a metal pole to make the whole structure more sturdy and resilient. The actual feeder will be made of weather-grade plastic.

Address originality and research of invention

we found similar products such as heated bird baths, but we couldn't find bird feeders that would keep seeds from freezing. We then looked at ways to minimize energy use when heating the bird feeder.

Because the seeds on the feeder won't be frozen, it will be easier for the birds to eat there, making it a more favorable spot to get a bite to eat and increasing the number and diversity of birds in the nearby area of the feeder.

Thank you so much for listening and hope you have a good one!

Video plan:

- On the moon
- American flag but we rip the flag off
- Place birdhouse on top
- Roof of birdhouse is not on yet
- Heating pad flys down into house and cord goes through hole and down pole
- Top flies on
- Zoom some circles (Camera pans around in circles)
- Catch a bird in a little astronaut space suit
- Bird flies up to feeder
- Takes off their little helmet and starts to eat
- Gives a wing (thumbs) up and little black circle exit transition

Little baby bird going to the mooooon (he still needs a house but we're getting there also what if we make the feeder heater loOK LIKE A ROCKET???????!!!!!!!!)

How to make a phone not get cold

Problem: phone randomly shuts off or loses large amounts of battery at once when left in the cold for long periods of time

Sleeping bag esque? At least for marketing?

Maybe also works for keeping phones from getting too warm?

Warm it up?

- Electricity?
- Hand warmers?

Insulate it?

Thermos

Bag that flips inside out

- One side keeps it safe from the cold
- One side keeps it safe from the heat

Some phone cases to protect against cold already exist but they look dumb and are expensive and we could market better than them

Damn: This already exists.

Potential project ideas:

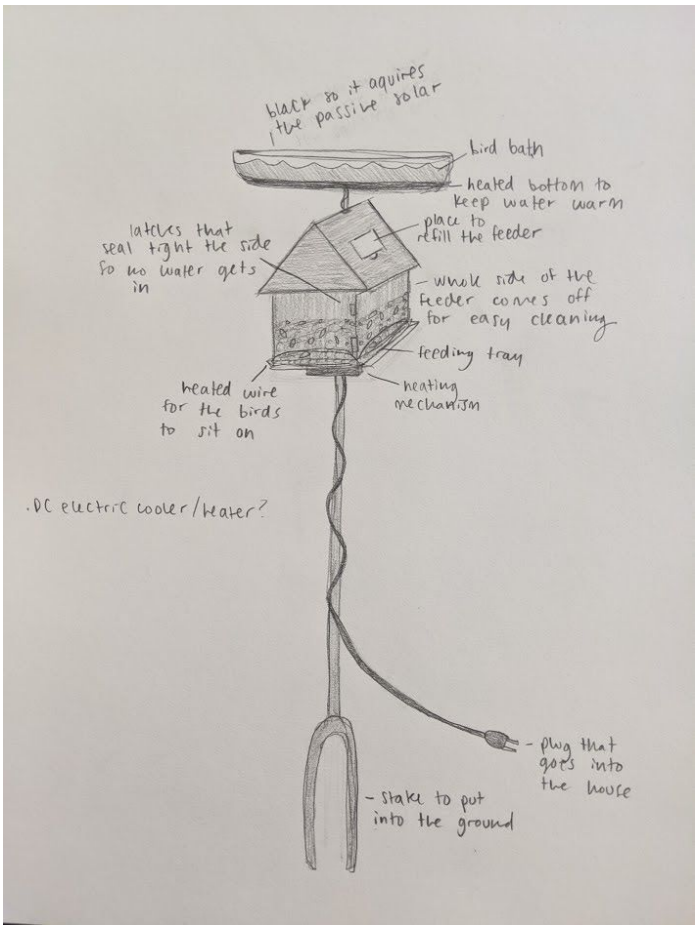
- 3D printed fairy doors/ houses
- Retainer/invisalign cleaner
- Heated bird feeder
    - Solar powered
        - Batteries? Extension cord?
        - How do we protect wires from getting chewed/broken
    - Bath underneath?
- Trunk windscreen rooms

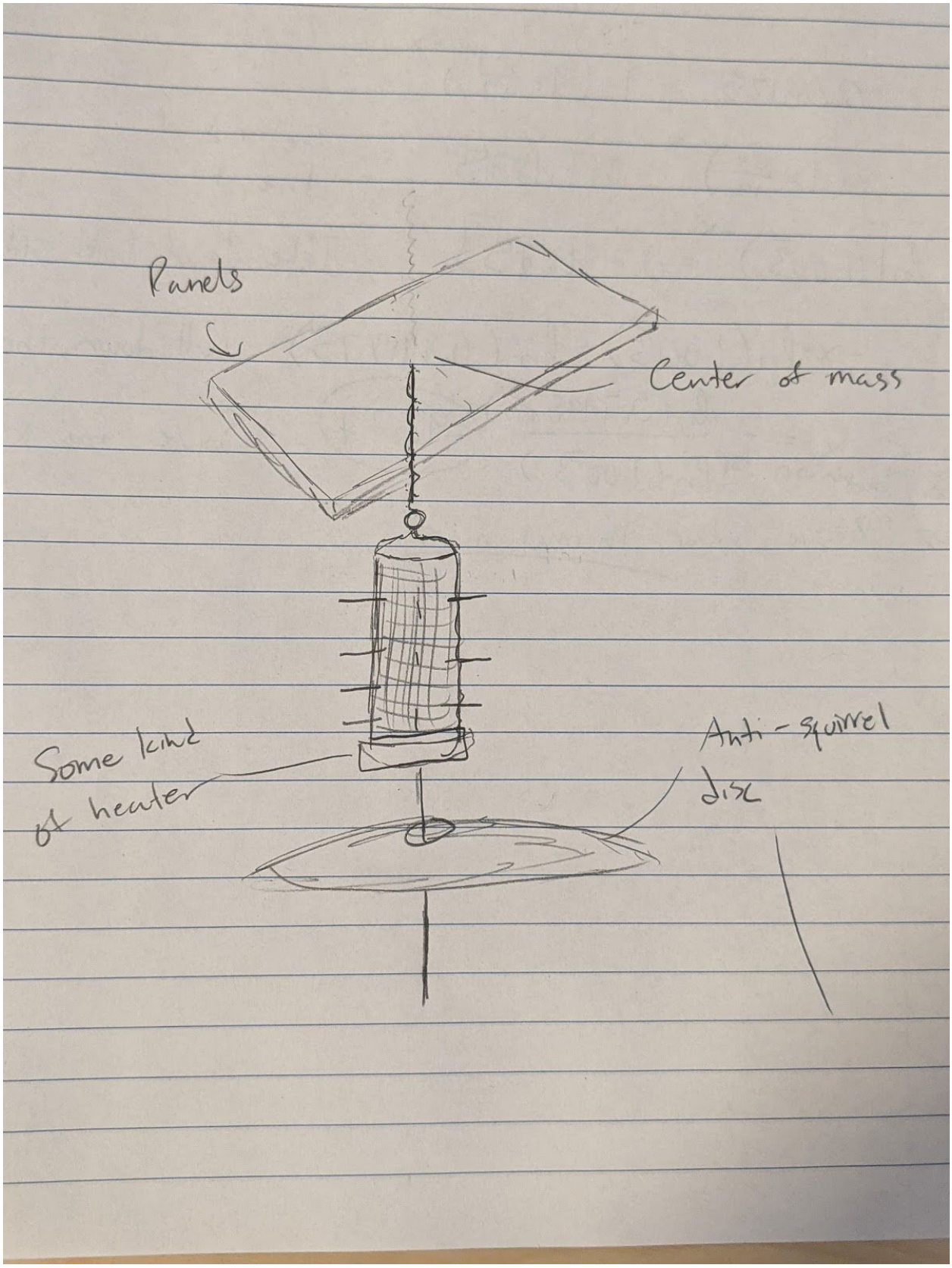
https://saltcases.com/collections/iphone-cases

- Strand i: Explain and Justify the Need
    - What problem are you solving?
        - Bird feeders are inefficient in the winter. The food freezes, the birds have no water, they are hard to clean, the squirrels get to them.
    - Who else besides yourself says there is a need for your solution?
        - Natalie's father and bird enthusiasts. (We could also use Ian's grandparents as a source in the unlikely event that Natalie's father does not know everything)
- Strand ii: Identify and Prioritize the Research
    - Who is your Primary Source?
        - Natalie's father, bird lover
    - What did they tell you that will help you with your design?
        - Something for easy access to cleaning out the feeder, a way for them to have water as well as food
    - Who is your Secondary Source(s)
        - https://www.thespruce.com/reasons-not-to-have-bird-feeders-385756
        - https://www.wbu.com/birds-find-water-winter/#:~:text=Birds%20need%20drinking%20water%20to,condition%20and%20keep%20them%20waterproof.
    - What did you find that will help you with your design?
        - We should have a water feature, they already have deck ones just with no feeder so we could use a similar design
- Strand iii: Analyze Existing Products
    - What existing products did you find that are similar to your solution?
        - They have some heated bird baths but there are not any feeders that I can see.
    - What existing components did you find that will help you with your design?
        - Being able to attach the feeder to the railing of a deck seems like a good idea,

easy plug in access and placement

- Strand iv: Develop a Design Brief
    - Complete Design Brief




Panels
Center of mass
Some kind of heater
Anti-squirrel disc

- birds pooping/landing on solar panels
- seeds fall into bath
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