

Om Patel ——— 3-22-22

CARABINER SHUTTLE PEN

BVT
Engineering &
Robotics



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Design Brief

Client	Rhode Island Novelty
Target Consumer	Pen Users
Designer(s)	Om Patel
Problem Statement	A carabiner pen is running out of stock. Create 3D printable replacements for each part.
Design Statement	As a design engineer I will create an identical copy of each pen part in Inventor.
Criteria	<ol style="list-style-type: none"> 1. Pen has to write in four colors 2. Must be identical to the real model. 3. Must switch between each color 4. Must have a carabiner that closes properly
Constraints	<ol style="list-style-type: none"> 1. Must be made in a week 2. Has to be 2 inches or less in diameter. 3. Pen must be light. 4. Must be functional. 5. Must be 10 inches in length.

Design Brief

Activity 2.2.3

Functional Analysis

For activity 2.2.3
we made a Black box
model and functional
analysis on the Pen

D) The main function of the automatic die coffee machine is to turn coffee granules into coffee.

a - hinged lid - polypropylene - allows water and coffee to be infused
 b - push-in handle - polycarbonate - protects all internal components
 c - coffee mass - contains the liquid coffee
 d - coffee dispenser - polycarbonate - prevents chamber where coffee mix and is the heated coffee
 e - On/Off switch - plastic - prevents power overload when heated
 f - thermal alarm - plastic - is released for recycling
 g - Power cord
 h - the plastic polycarbonate instrument was heated first - keeps hot surface safe at the bottom top
 i - water - lets steam escape

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a. coffee filter basket
 b. water reservoir
 c. water pump
 d. shower head
 e. hinge
 f. removable coffee bean cup

⑧ Production System by SHU
 1. water reservoir
 2. water reservoir pump the water out at the shower head
 3. the water goes through the coffee grounds collecting the flavoring
 4. the water goes down from coffee grounds

⑨

Product Name: Single Cup Coffee Maker
 Company Name: Beantecent
 Purpose of the Product: To make coffee grounds and water into coffee

INPUTS	Product Function	OUTPUTS
Electricity Water Coffee Grounds	Uses electricity to heat the water, which creates steam and forces the water to flow into the coffee grounds collecting flavor to create coffee.	Hot Coffee Steam

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① S.B. Customer Service Team - Feedback flow
- Website, Twitter, Facebook, LinkedIn

② To track areas for which a person can send information in different ways, why are objects?

③

④

a-cip
2-grp
a-vip

⑤ Hypothesis:
What the major problem during the link? It's really a problem during connecting into the local network. It may cause a link of the router.

⑥

Product Name: S/B in Customer Service Plan
Company Name: Middle Island Novelty
Purpose of the Product: To provide a way to attach a person can receive information in different colors using only one object.

INPUTS	Product Function	OUTPUTS
Tail	Flashing connected to form the two segments major to be linked up and be used as a warning device.	Pin

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DATE: 2/26/18

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③ Some ~~inside~~ ^{internal} components are hidden inside the product case by a spring to push the ink or bridge back up and a holder to keep the tabs in place.

④ My partner put the inputs as ~~reductions~~ ^{reductions} while I use more human inputs but we decided to use my method.

Conclusions:

① The black box system model illustrates the concept of abstraction by only focusing on the inputs and outputs.

② Making a non-destructive analysis, while a disassembly is important because it allows you to see how the parts worked before they were disassembled.

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Activity 2.2.4 Structural Analysis

For activity 2.2.4 we had to make a product disassembly chart, measure length and width, etc.

We also had to disassemble the pen.

Reflection Question
How the world is brought into existence is a mystery. Despite the scientific advancement, we still have many questions.

Product Disassembly Chart

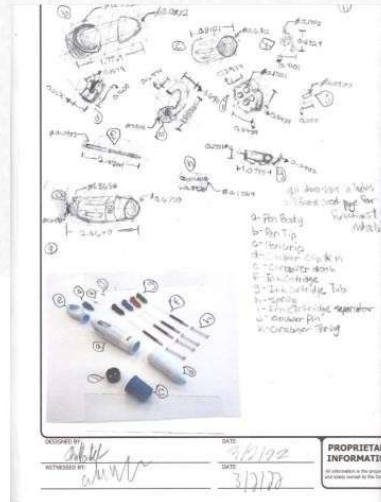
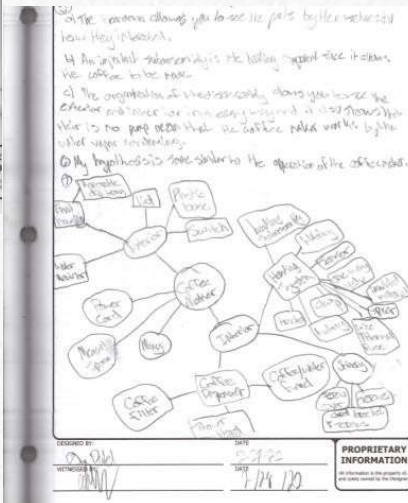
Name: Chaitan Khatiwala Date: 3/12/22 Time: 11:45 AM

Part #	Part Name	Qty	Dimensions	Function	Material	Density	Mass or Weight	Finish	Tolerance	Interactions with Other Parts	Notes (i.e. other design information)
1	Cap	1	N/A	Protect the tip	Plastic	1.2	1.5g	Smooth	±0.1mm	Attaches to the tip	Handwritten notes
2	Barrel	1	N/A	Hold the tip	Plastic	1.2	1.5g	Smooth	±0.1mm	Attaches to the tip	Handwritten notes
3	Spring	1	N/A	Push the tip up	Spring	7.8	0.5g	Polished	±0.05mm	Attaches to the tip	Handwritten notes
4	Tip	1	N/A	Write	Plastic	1.2	0.5g	Smooth	±0.1mm	Attaches to the barrel	Handwritten notes
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Product Disassembly Chart

Part Name: Pen Part # 1 Part Qty 1 Part Dimensions 150mm x 10mm x 10mm Part Function Write Part Material Plastic Part Density 1.2 Part Mass or Weight 1.5g Part Finish Smooth Part Tolerance ±0.1mm Part Interactions with Other Parts Attaches to the tip Part Notes (i.e. other design information) Handwritten notes

Part #	Part Name	Qty	Dimensions	Function	Material	Density	Mass or Weight	Finish	Tolerance	Interactions with Other Parts	Notes (i.e. other design information)
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Reflection Question
The world is brought into existence by the people who create it. Despite the scientific advancement, we still have many questions.

Product Disassembly Chart

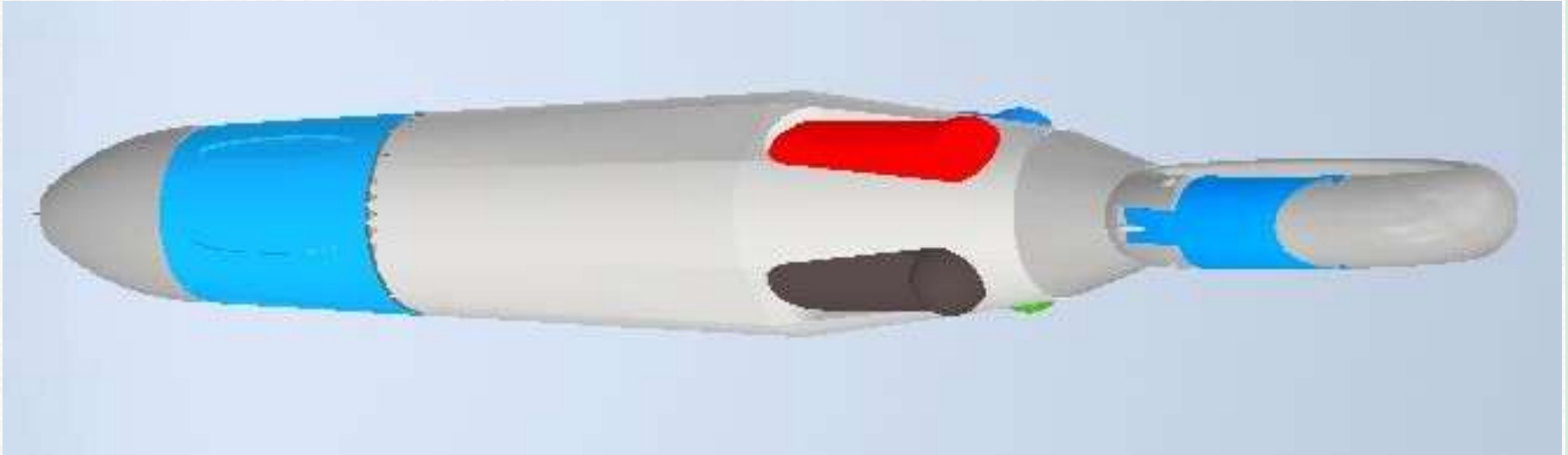
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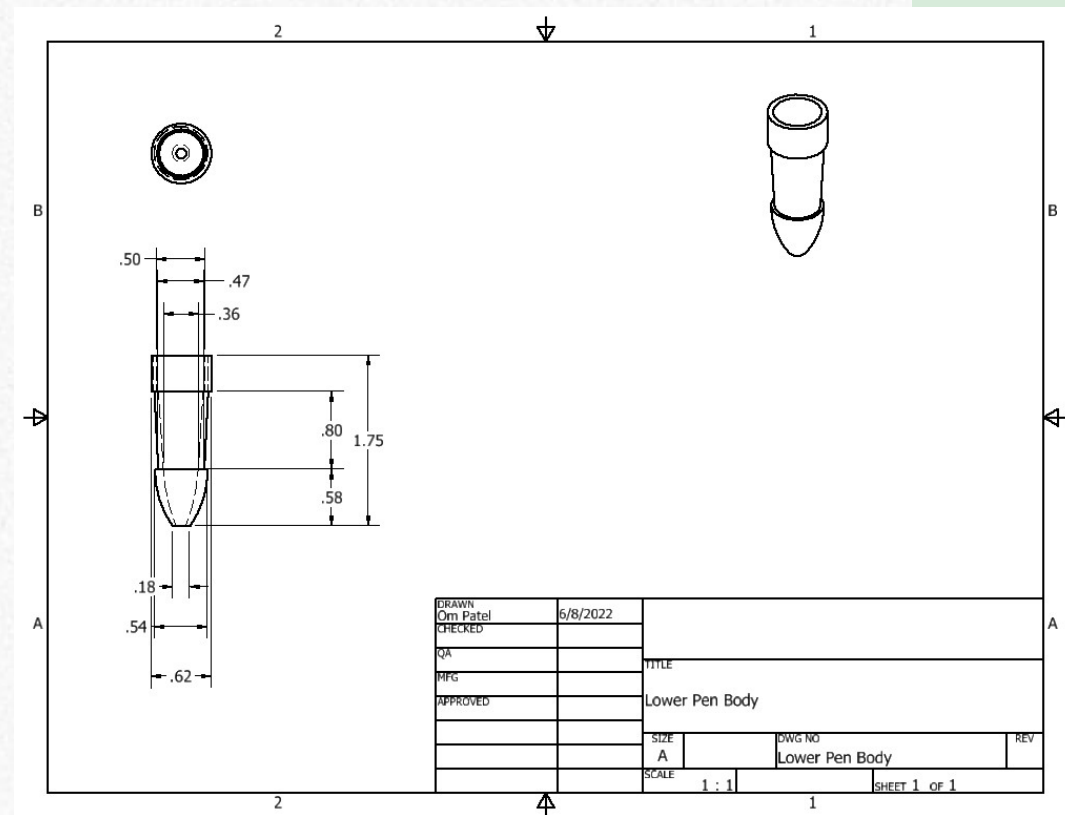
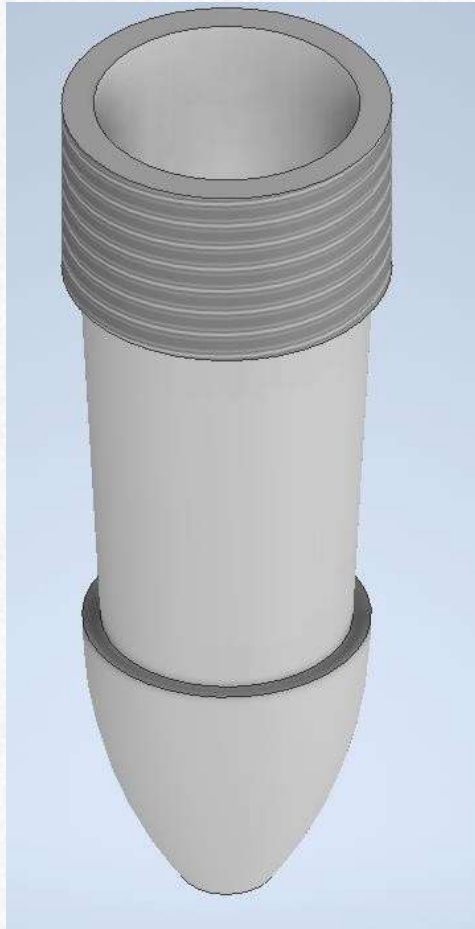
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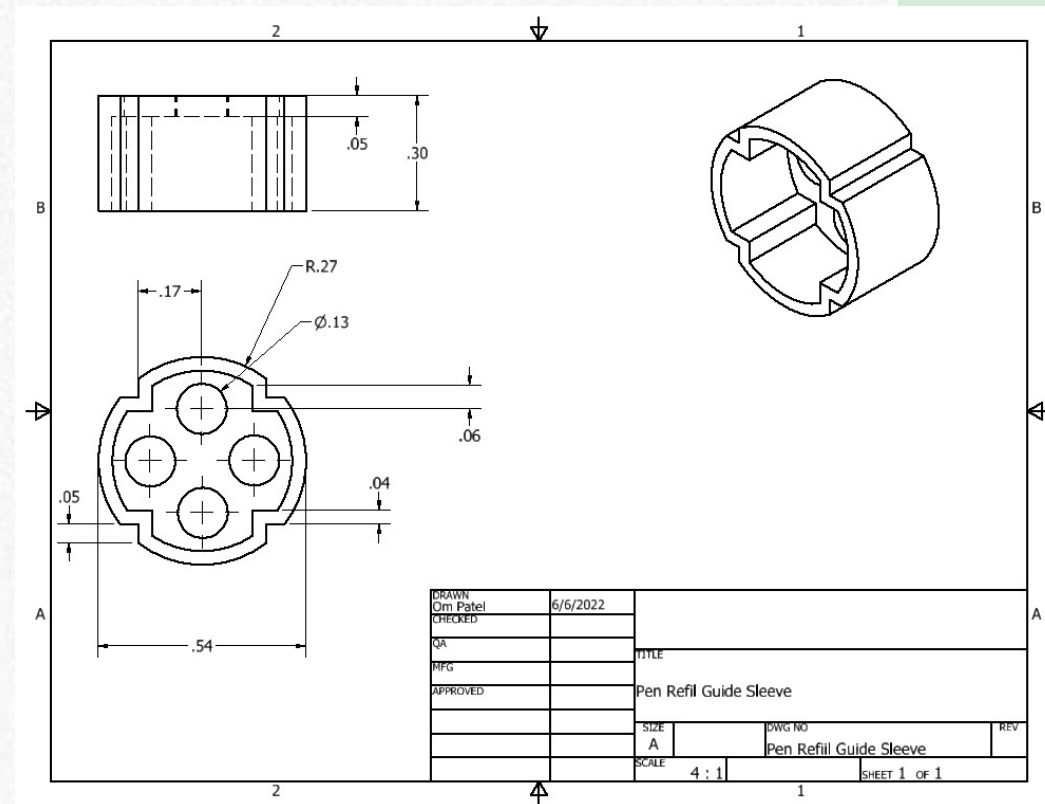
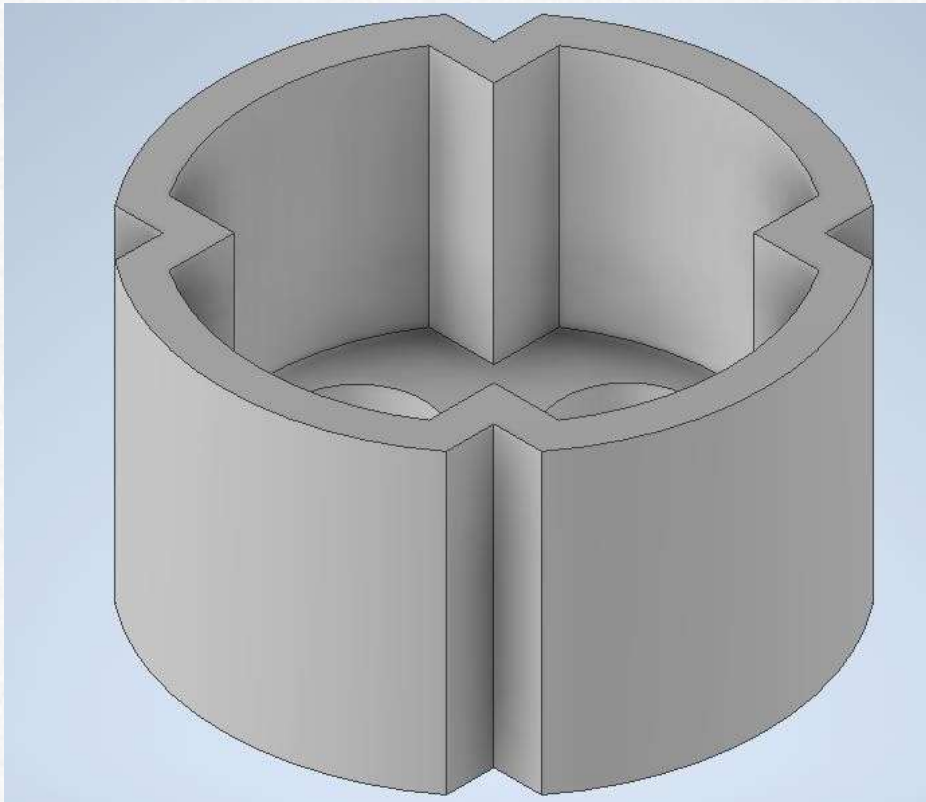
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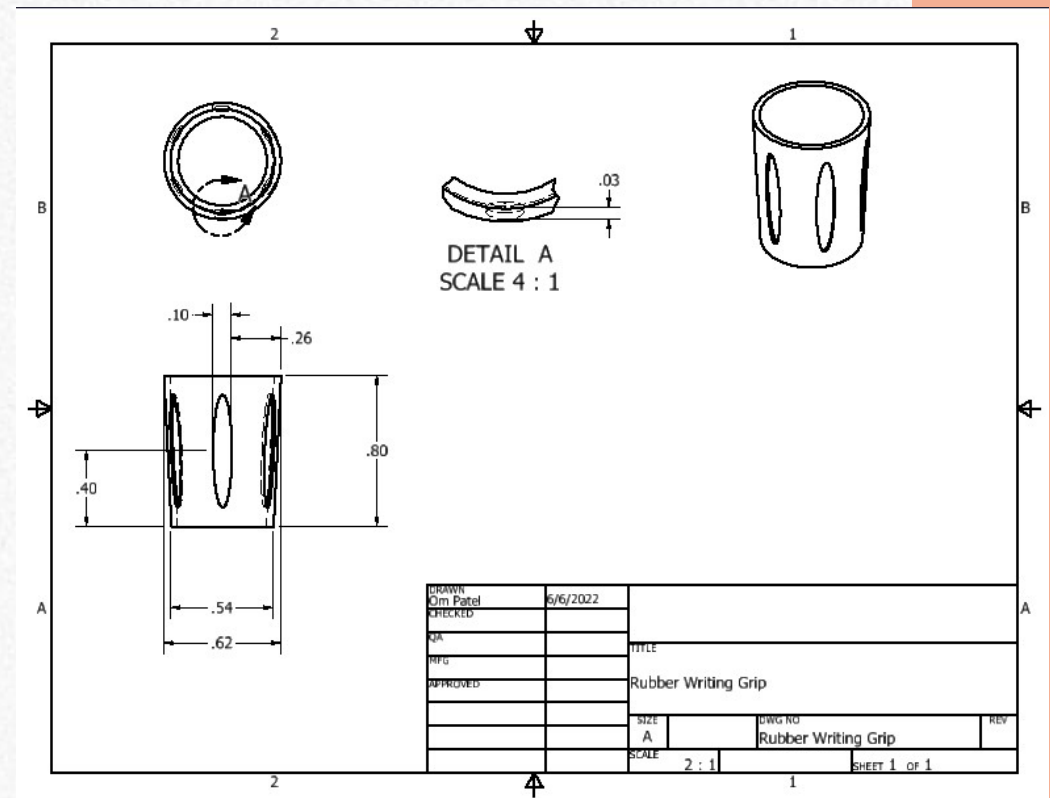
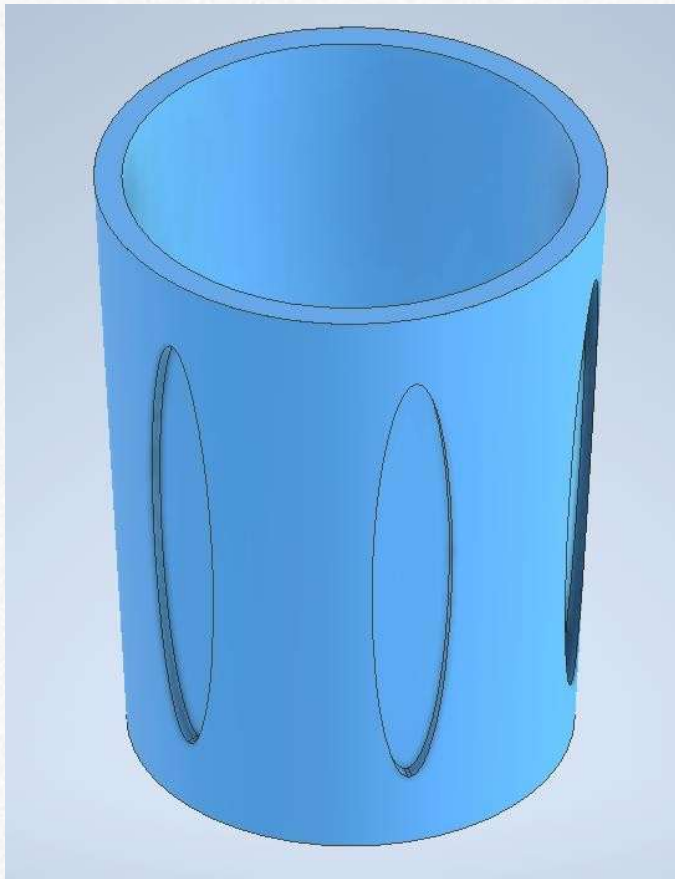
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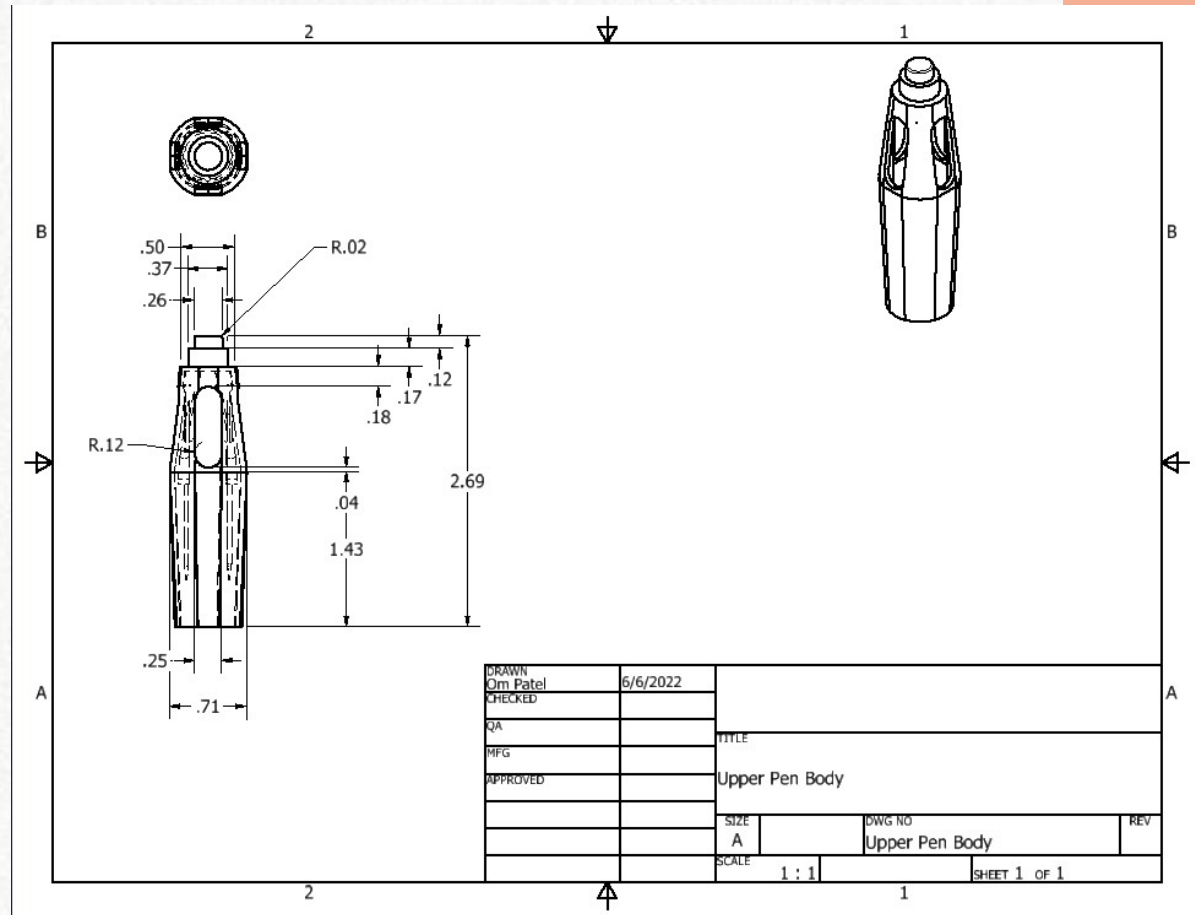
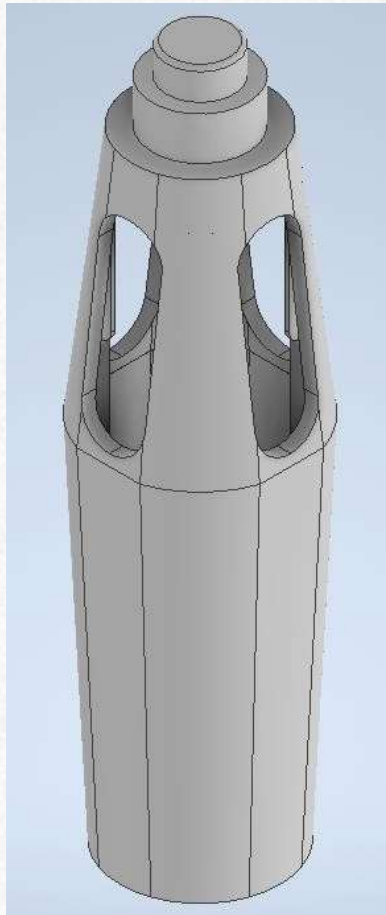
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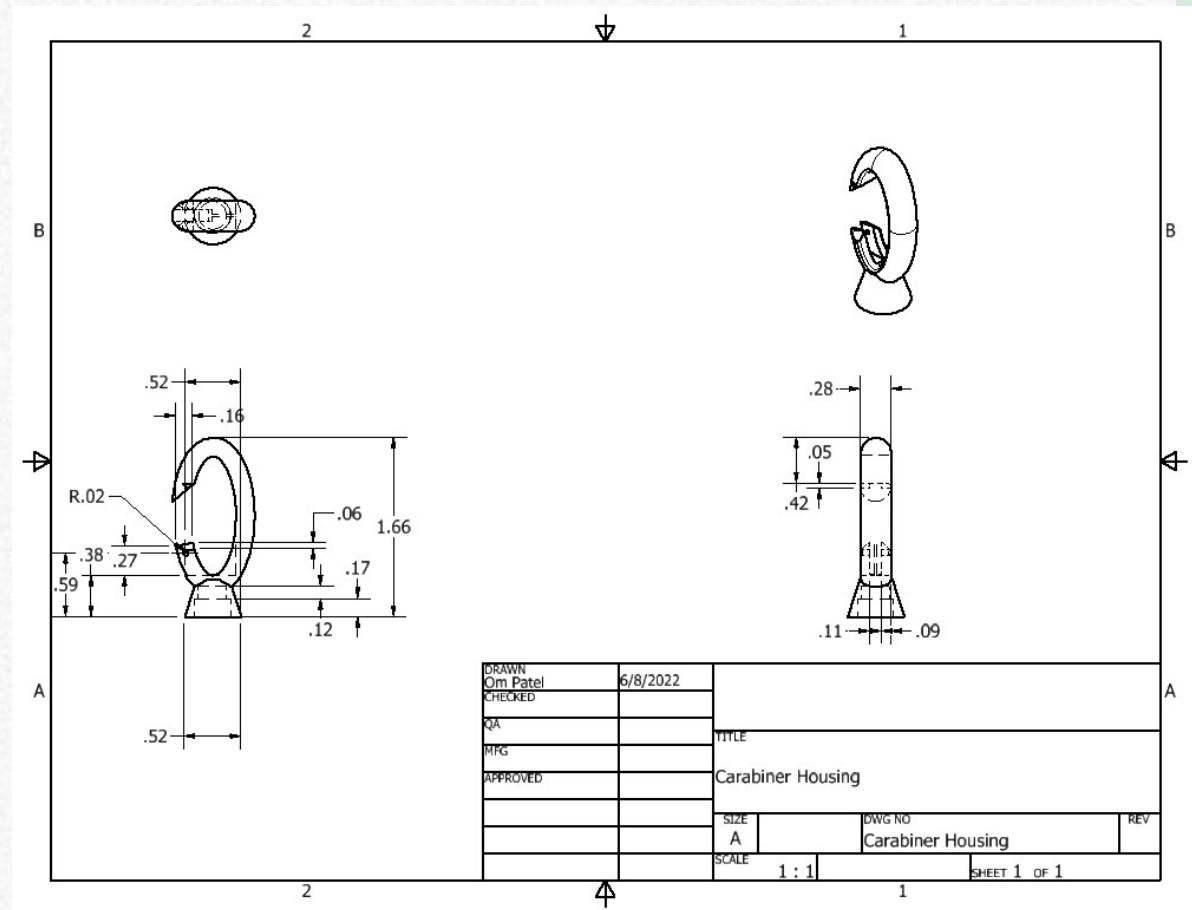
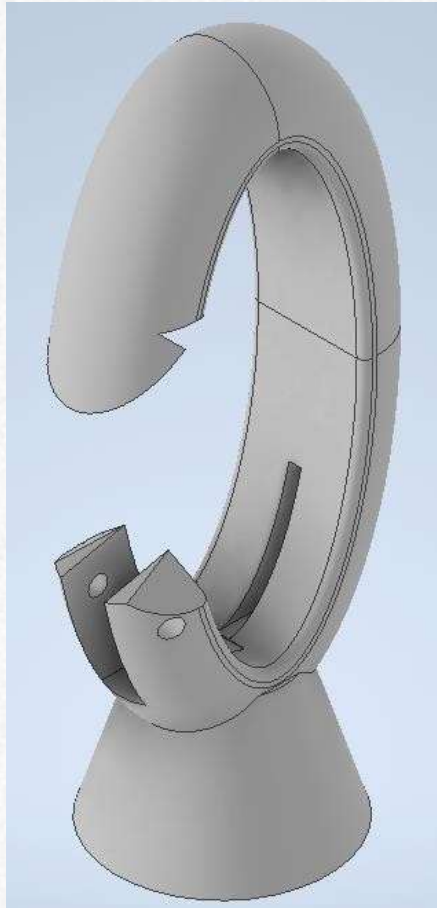
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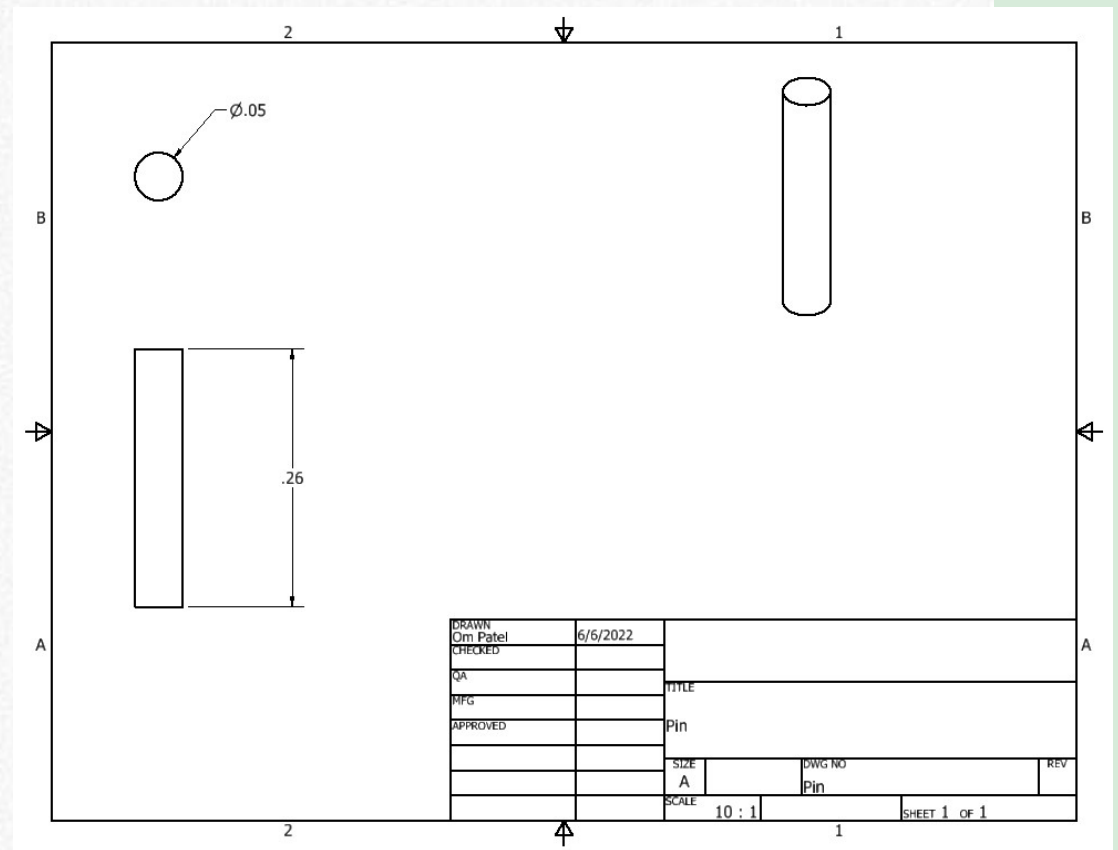
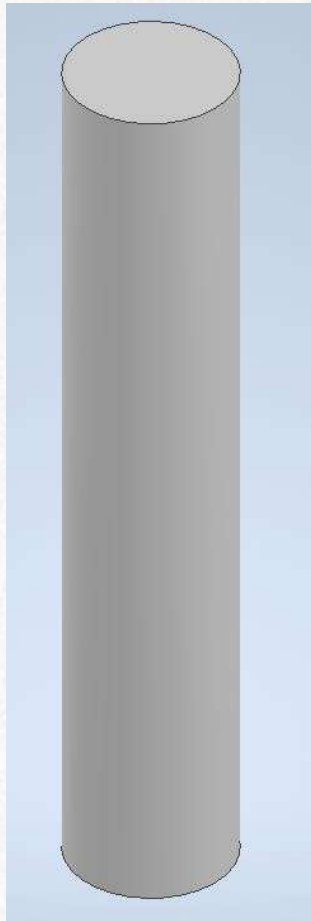
Upper Pen Body



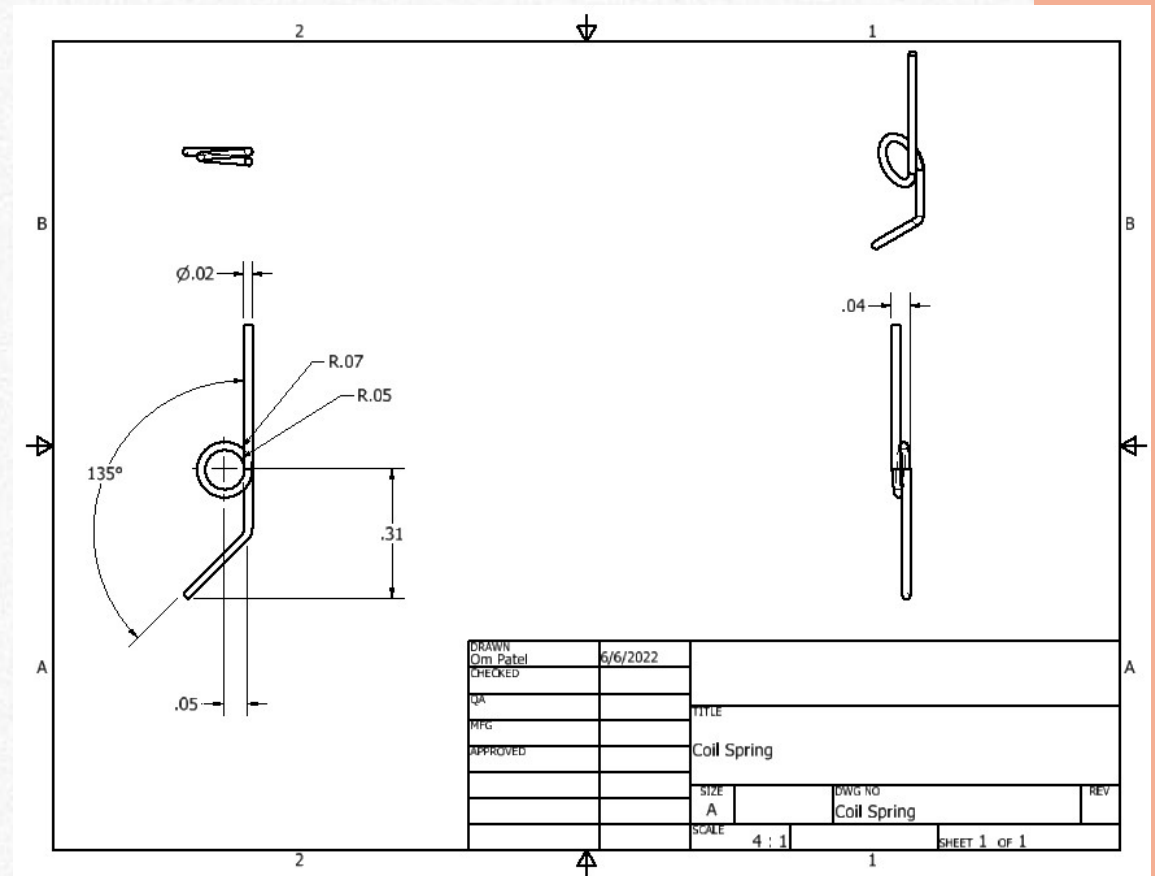
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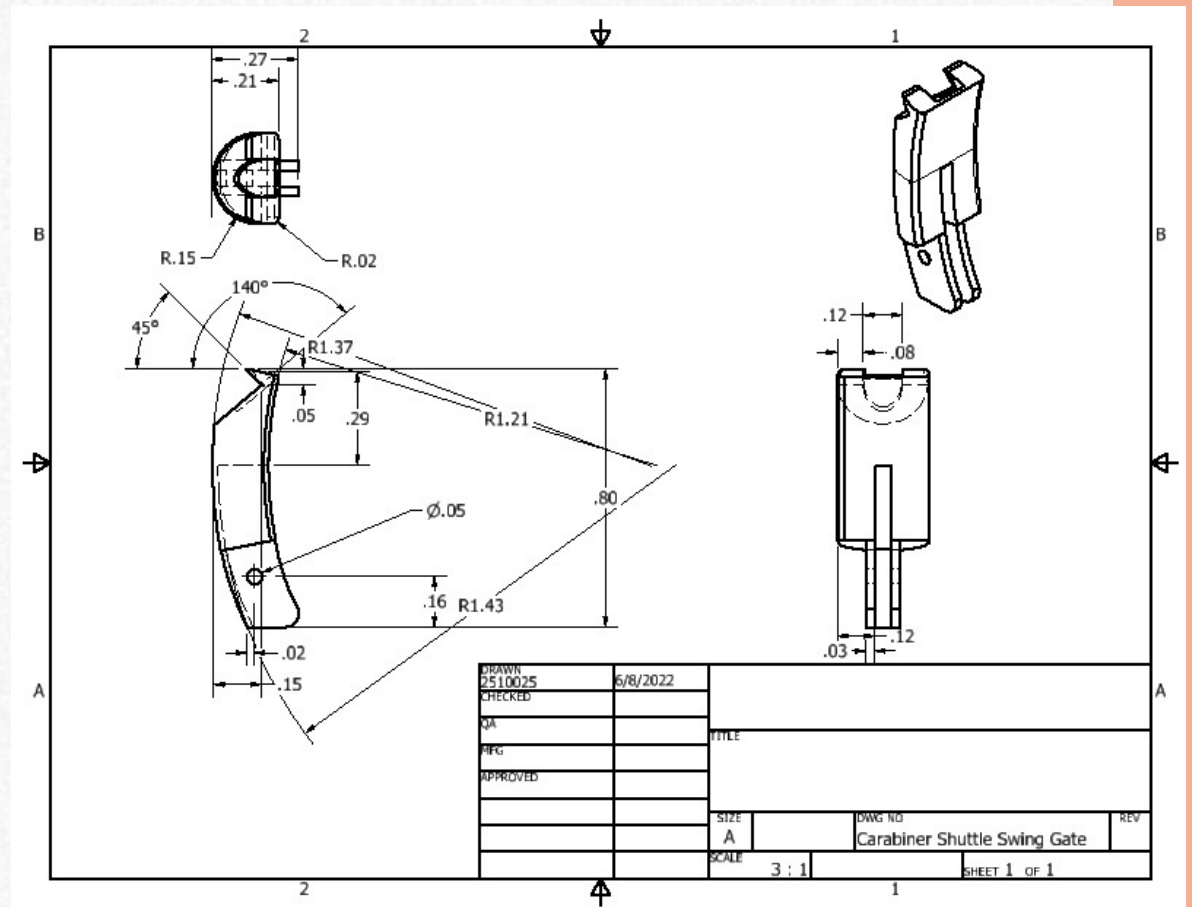
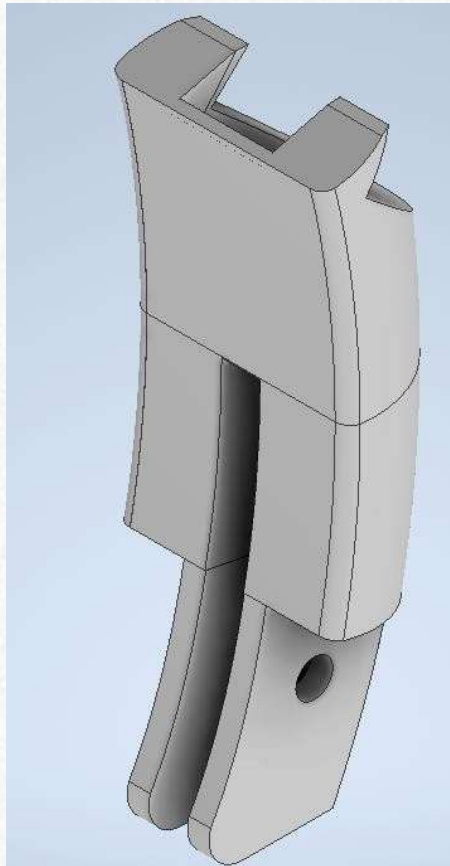
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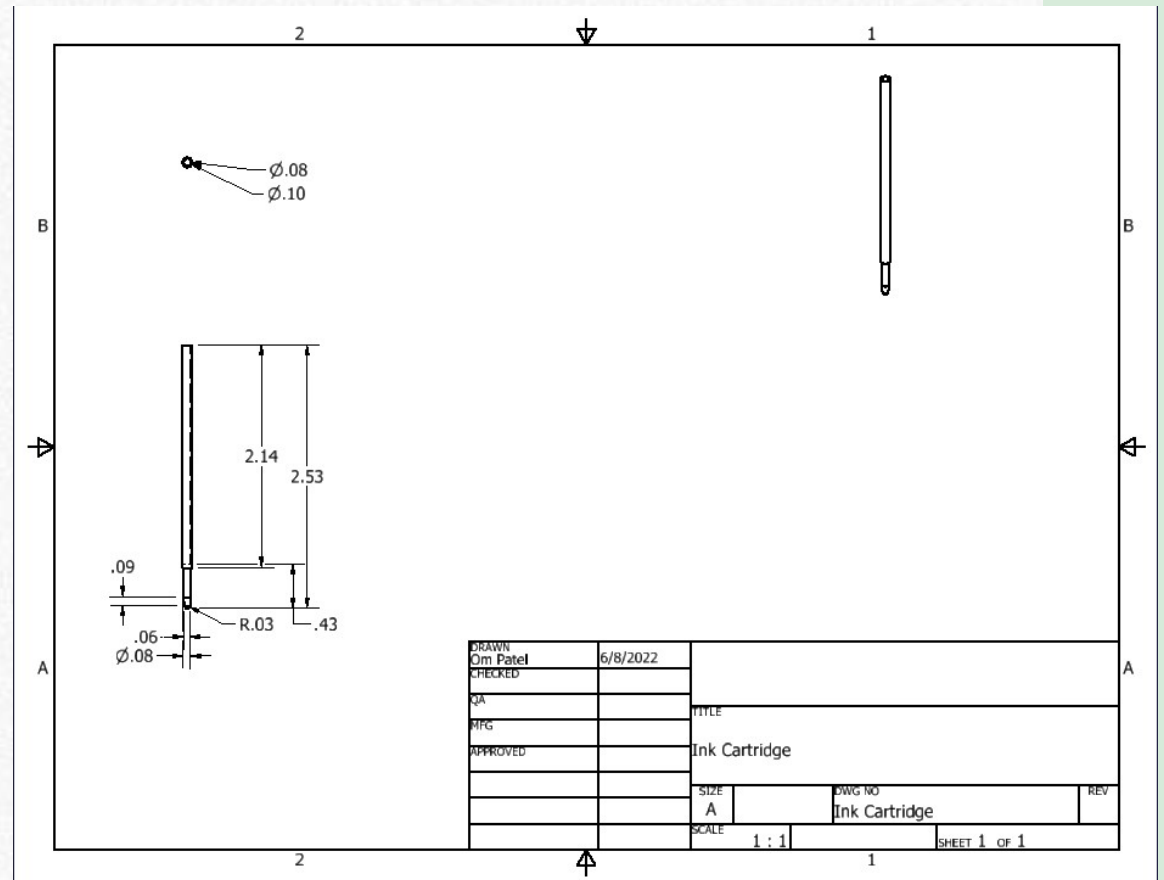
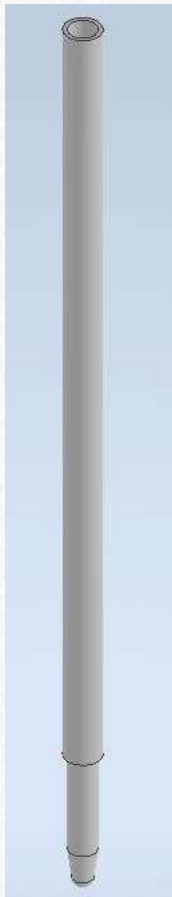
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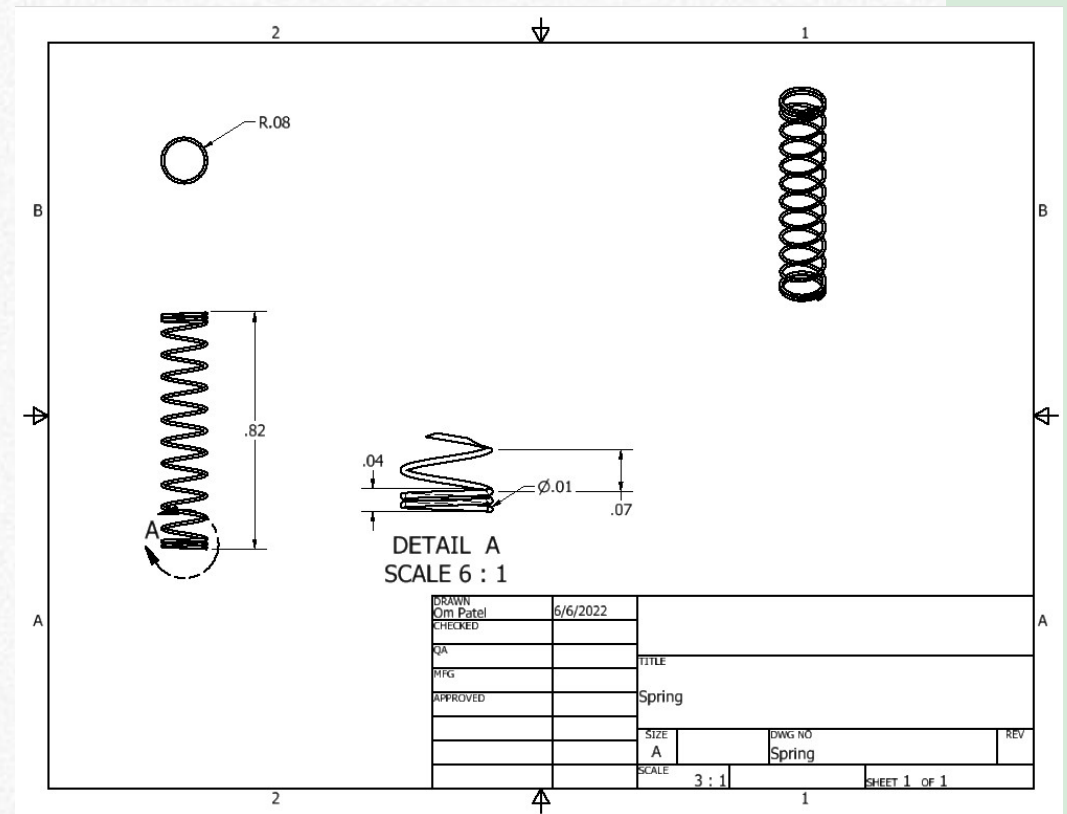
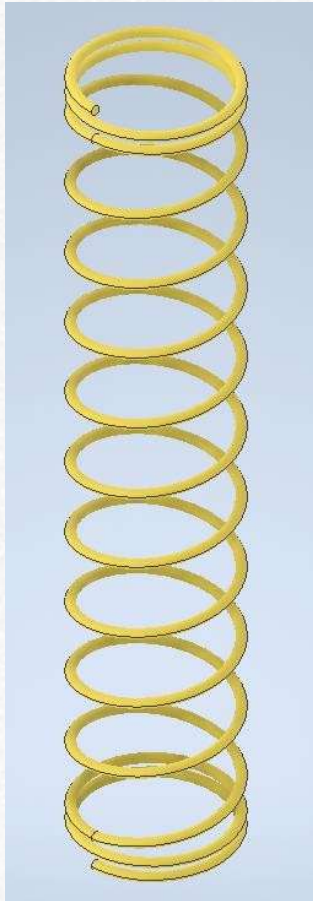
Carabiner Gate



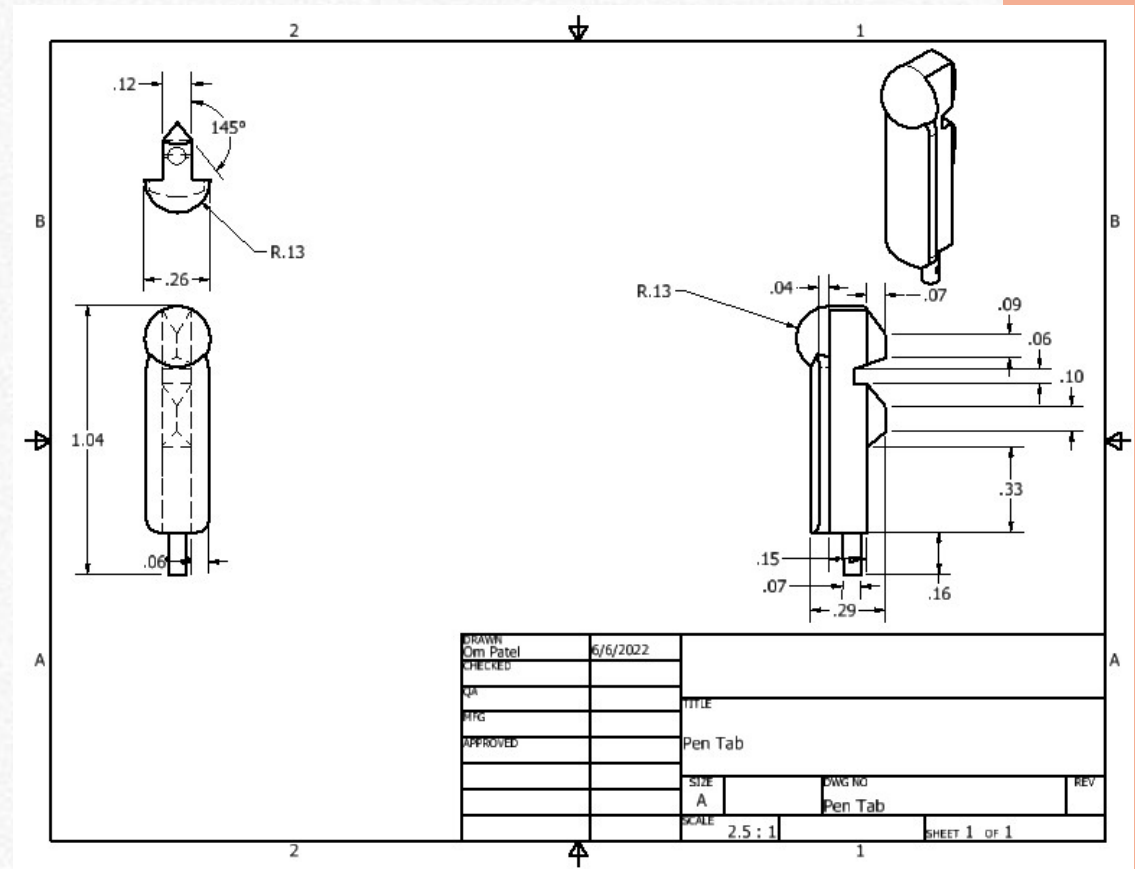
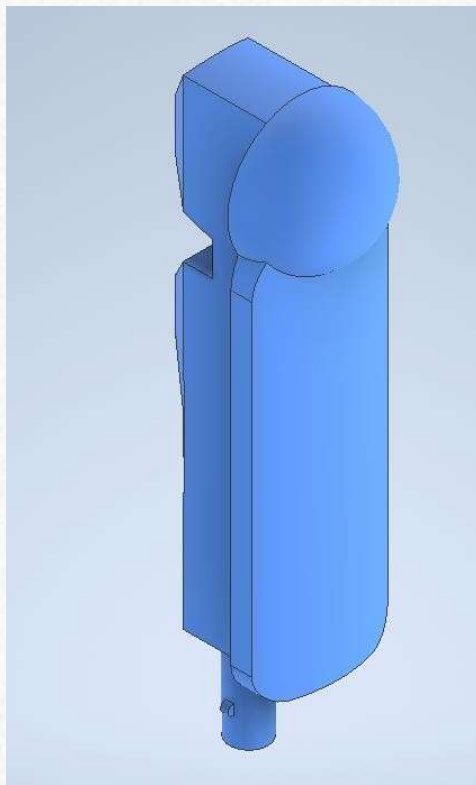
Ink Cartridge



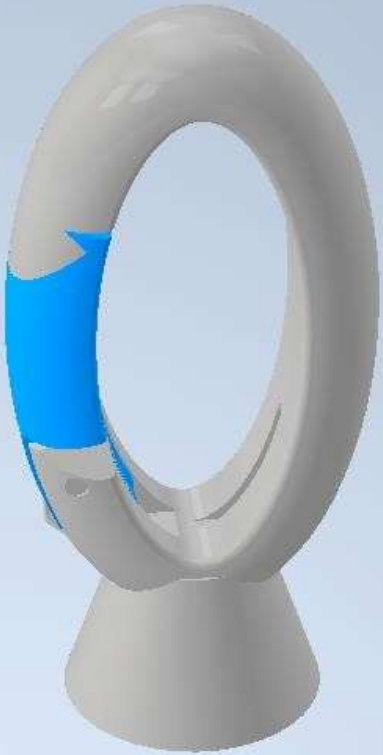
Pen Refill Return Spring



Writing Plungers



Carabiner Su Assembly





Pen Body Sub Assembly

Ink Cartridges Assembly

