

Assistive Clips

Paula de Santos Dorrego _ 03/02/2024 - 14/02/2024



Project Brief

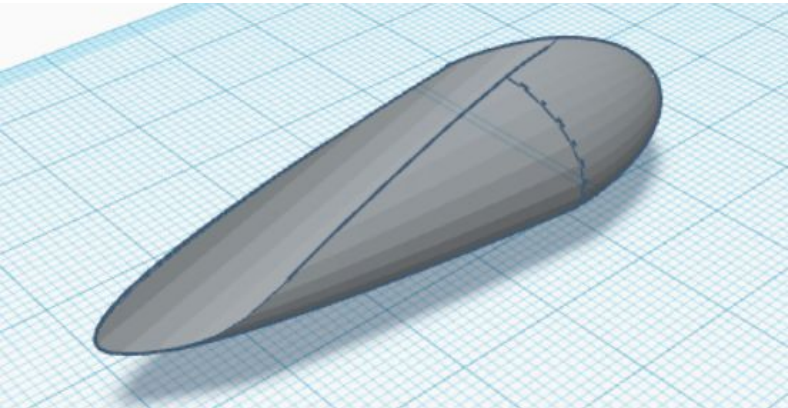
The brief for this project was to ‘Make an assistive clip that attaches to a specific object, making it easier to use for a person with arthritis or a weak grip’. The process involves exploring the example design opposite, before using the gained knowledge and skills to design a unique device for another object.



Pen Clip Tests

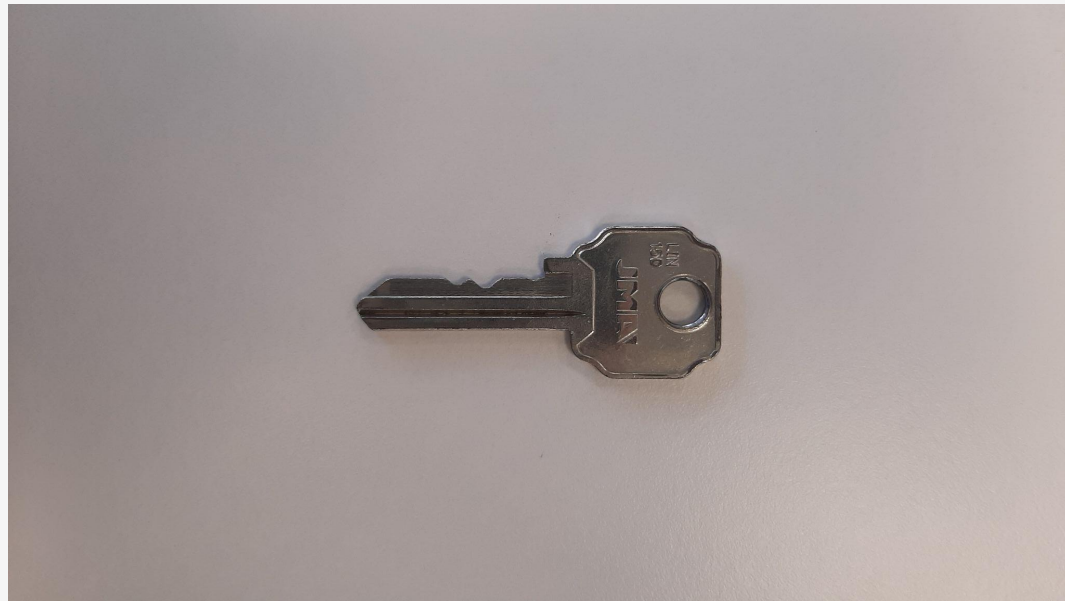
The clip test parameters were amplified or reduced in 0.5 or 0.25 ranges. Combining various of them to get the final product, due to some of the initial parameters being very fragile or very robust so that it was impossible to clip it to the pen. For the assistive writing aid, using the tutorial as a guide, the back of the design and also the height was modified for a more ergonomic use of the device.

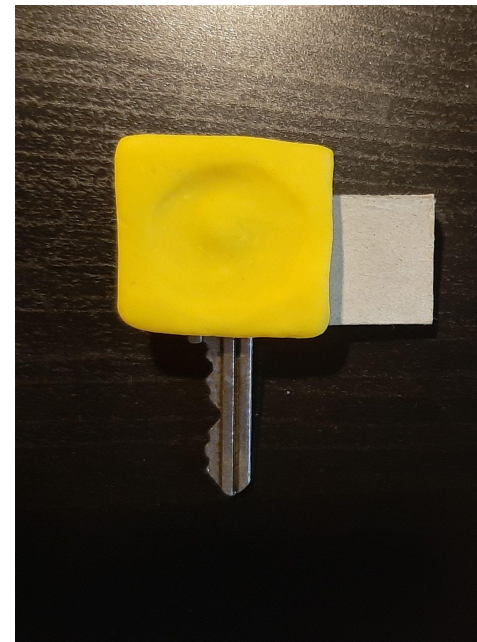
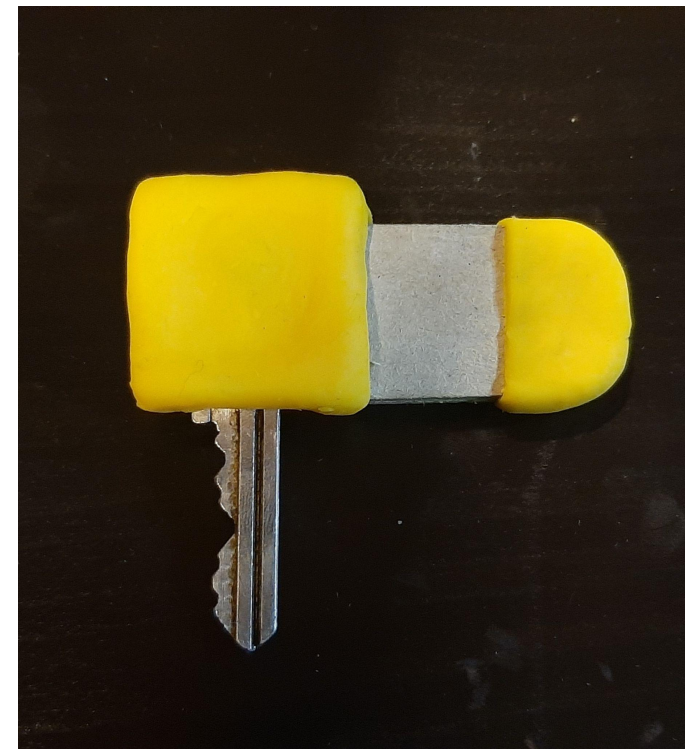
	Hole Diameter	Clip Thickness	Cutout Length	Analysis/Comments
Test 1	10 mm	1 mm	8 mm	Hole diameter to lose it slips off the pen.
Test 2	9 mm	1 mm	7 mm	Doesn't fit.
Test 3	9.5 mm	1 mm	8 mm	It breaks, maybe because it isn't flexible enough due to its thickness?
Test 4	9.5 mm	0.75 mm	8 mm	It adjusts well, but it can be more closed on the cutout.
Test 5	9.5 mm	0.75 mm	7.75 mm	



Object Selection

I have chosen to design an assistive clip for a key, recognizing the ubiquity of this everyday object and the challenges it poses for individuals with arthritis or a weak grip. This clip would offer an extended, easy-to-grip handle, reducing the force required to turn the key and providing a more comfortable and accessible solution.





Real-time Prototyping

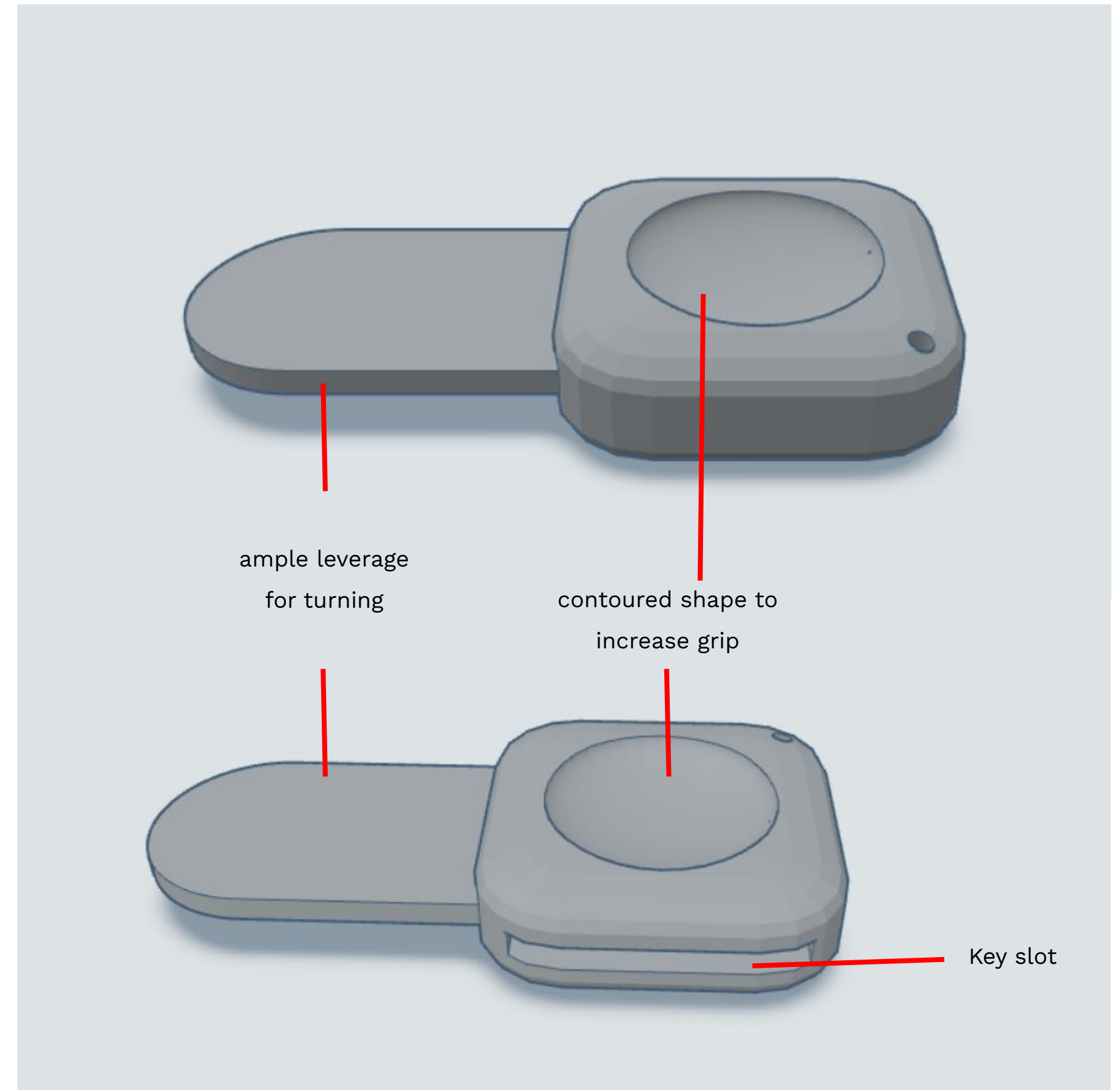
This initial phase involved experimenting with various handle shapes and sizes to optimize comfort and usability. The plasticine models served as tangible, malleable representations, facilitating quick adjustments and refinements based on user feedback and ergonomic considerations. Once satisfied with the physical prototype, the transition to digital design using Tinkercad was seamless.

Design Criteria

After multiple iterations and real-time prototyping sessions, the selected prototype for the assistive key clip features an extended handle with a contoured, textured grip surface. The design criteria were meticulously generated to address the specific needs of individuals with arthritis or a weak grip.

The extended handle aims to provide ample leverage, reducing the force required to turn the key, while the contoured shape ensures a comfortable and secure grip. The textured surface enhances tactile feedback, aiding users in maintaining control even with diminished dexterity.

The design criteria prioritize not only functionality but also consider the aesthetic and ergonomic aspects to create a product that seamlessly integrates into everyday life. The chosen criteria are indispensable for the final model as they directly contribute to the clip's effectiveness in enhancing accessibility, ensuring ease of use for individuals facing challenges associated with arthritis or weakened grip strength.



Designing + Making

First of all, in Tinkercad I followed these 2 steps:

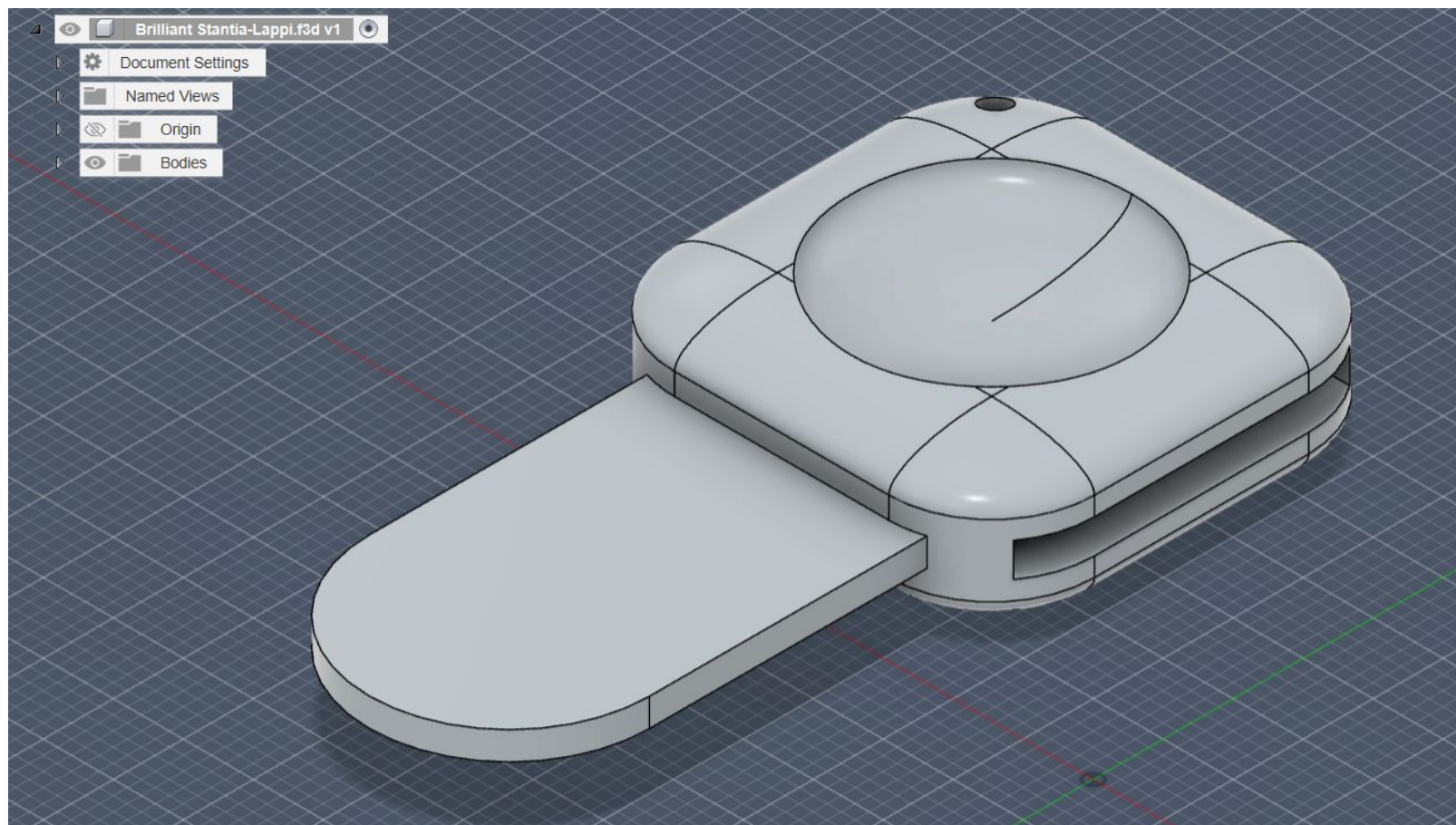
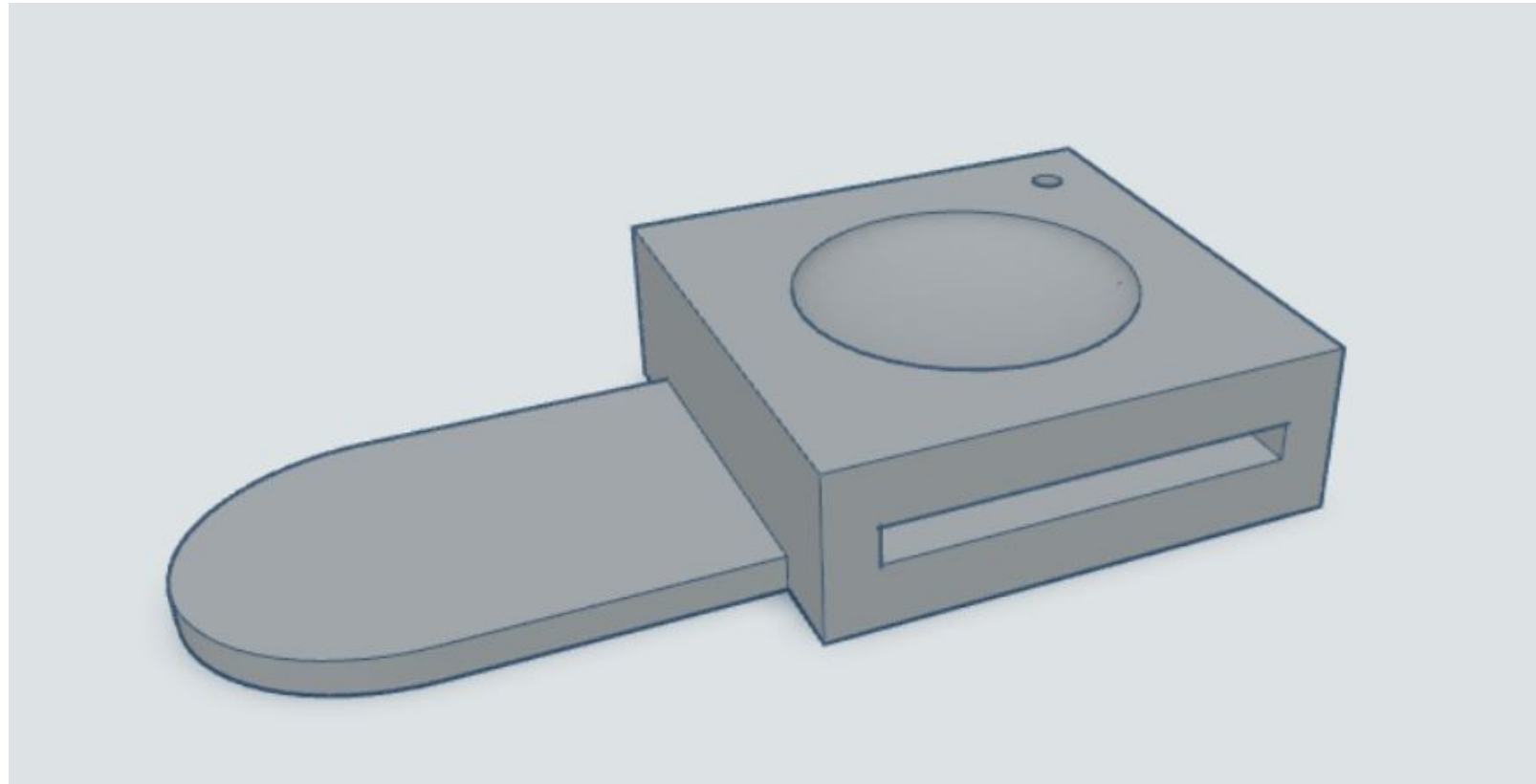
Added Details and Features:

Using Tinkercad's shape tools to add contours and details to the handle, ensuring a comfortable and ergonomic grip. Incorporate textures or patterns on the grip surface to enhance tactile feedback.

Integrate Key Slot:

Create a slot or holder for the key, ensuring a secure fit. Pay attention to the dimensions to accommodate various key sizes. The creation of the initial 3D printed prototype for the assistive key clip involved a systematic and iterative process. After finalizing the design using Tinkercad and Fusion 360 for some detailing, I exported the 3D model and prepared it for printing. The first step included selecting suitable printing parameters such as layer height and infill density.

Once the printing was complete, I carefully fine-tuned the prototype to ensure a smooth and functional finish.



Iteration

The 3D printed prototype underwent practical testing with intended users (my grandma). Observations on the ease of key insertion, the comfort of the grip, and the overall user experience were carefully considered. These insights were then translated into refinements in Tinkercad, where adjustments to dimensions were made (increased the key slot width).

