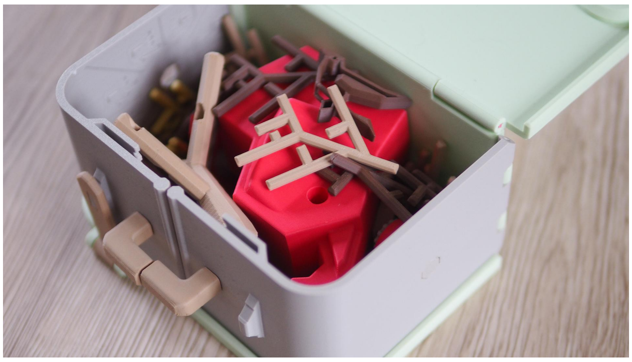
PINCHEE

Created by PrintLab International Ltd

Version 1: 16.09.25

Maker Guide

Pinchee is a fully 3D-printable, 2-player dexterity game where players pinch their bird to stack twigs on a cheerful elephant. Combining fun with finger and wrist exercises, it's enjoyable for everyone and offers particular benefits for individuals with hand arthritis. Score points by stacking twigs and aim for victory in the high-stakes endgame!



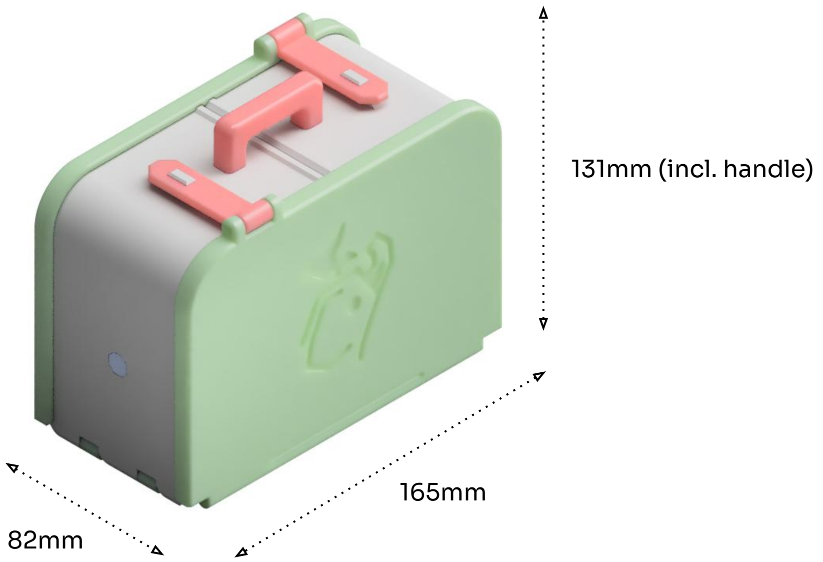
Pinchee Origins

Pinchee began as a design project by PrintLab's Lead Designer, Rob Mafrici, who participated in the Make:able 3D Printing and Assistive Technology Challenge. Rob set out to create a life-enhancing device for his end user, Cath, who has osteoarthritis in her hands.

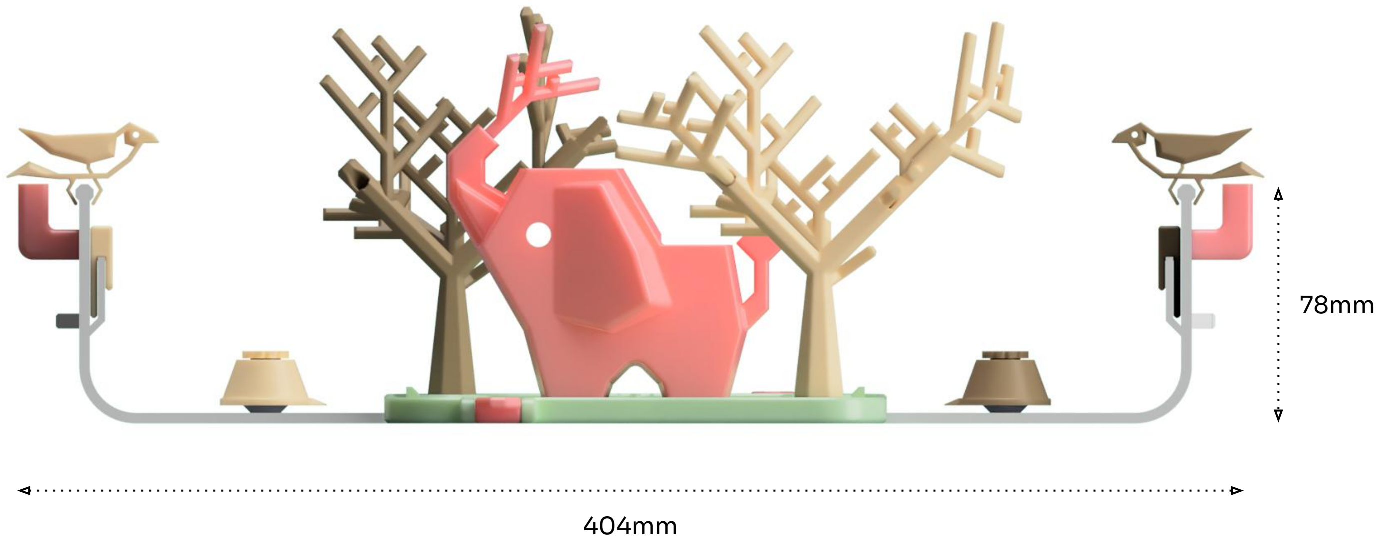
Using the step-by-step process in the Make:able Online Toolkit, Rob developed empathy through interviews and observation studies. This led to three key insights that shaped the design process:

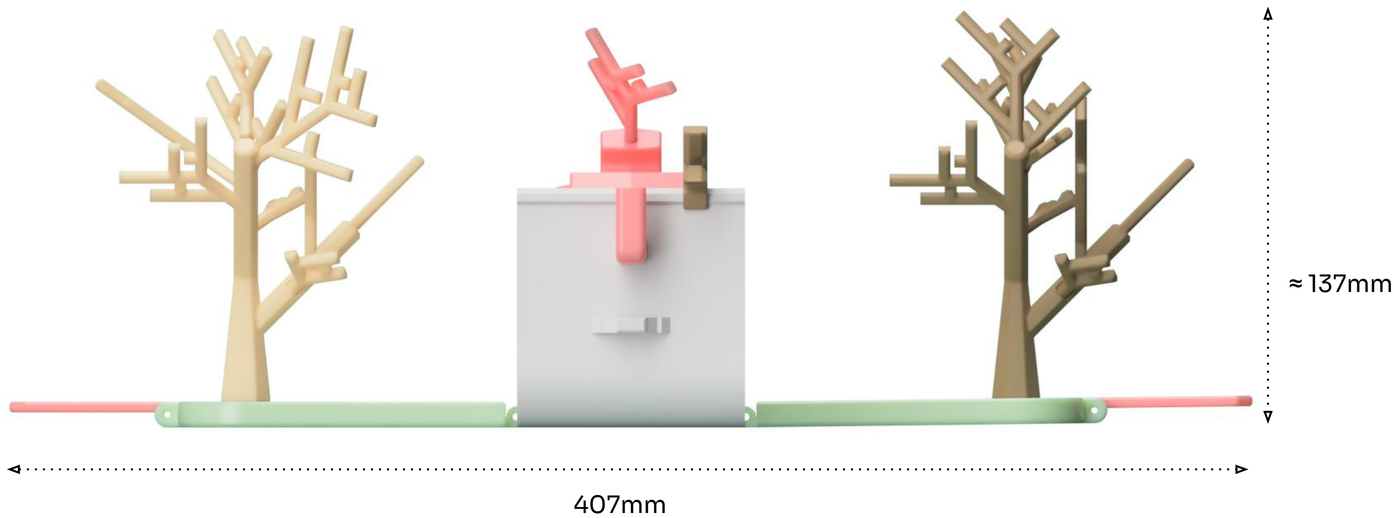
- Hand movements and exercises significantly alleviate Cath's arthritis symptoms.
- Cath disliked traditional assistive devices due to their clinical aesthetics, which she felt "scream disability".
- Cath has a deep love for anything related to elephants!

After numerous prototypes and iterations, Pinchee - the 'not-so-obvious' assistive device - was born. We hope Pinchee not only gains widespread use but also inspires others to design and manufacture 3D-printed assistive devices.



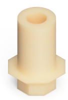
≈Weight: 380g





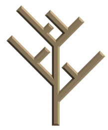
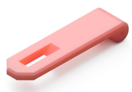
Parts List

*All parts are 3D printed components
*Costs are per unit and not total quantities

File Name	Qty	≈ Material Cost (USD)	Image
Elephant	1	$1.64	
Base	1	$1.06	
Tray	2	$1.36	
Scoreboard	2	$1.08	
Spinner - Axle	2	$0.03	
Spinner - Main Body	2	$0.09	
Spinner - Cap	2	$0.02	
Score Tracker	2	$0.02	
Tree	2	$0.21	
Bird	2	$0.07	

Parts List

*All parts are 3D printed components
*Costs are per unit and not total quantities

File Name	Qty	≈ Material Cost (USD)	Image
Twig - Small	7	$0.02	
Twig - Medium	7	$0.04	
Twig - Large	7	$0.06	
Latch	2	$0.06	
Suitcase Handle	2	$0.05	

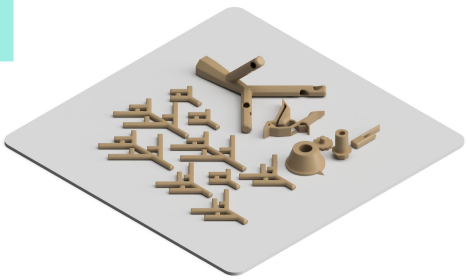
Tools Required
3D Printer with PLA filament
Flush Cutter/Scissors
2mm Screwdriver/Drill Bit

3D Print Files

The STL 3D print files for Pinchee are organised into two folders: ‘Grouped’ and ‘Individual’. The Grouped folder contains six ready-to-print files (shown below), with components grouped by recommended colour. These files require a 3D printer with a print bed larger than 210x210mm. For users with smaller print beds or for those who want to change colour configurations, the Individual folder provides separate files for each component, allowing you to arrange your own print beds as needed.

In addition to the STL files, a Bambu Studio 3MF file is included, featuring pre-arranged print beds and recommended settings for Bambu Lab P1P, P1S, and X1C machines.

1



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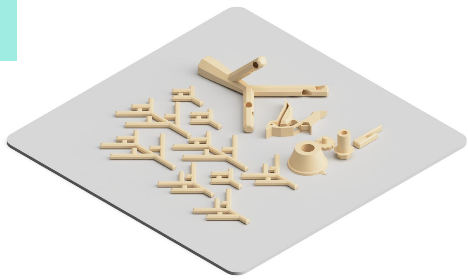

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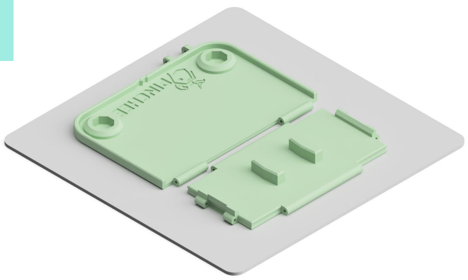

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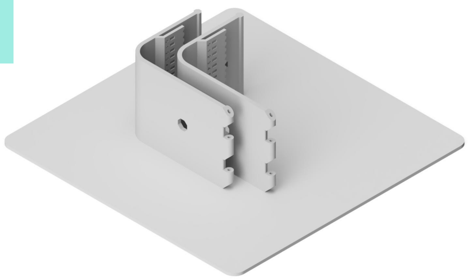

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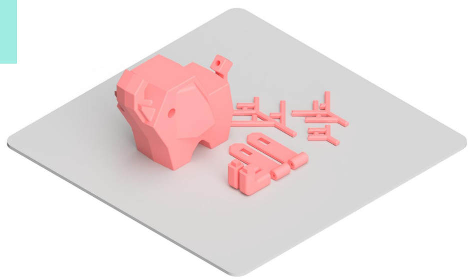
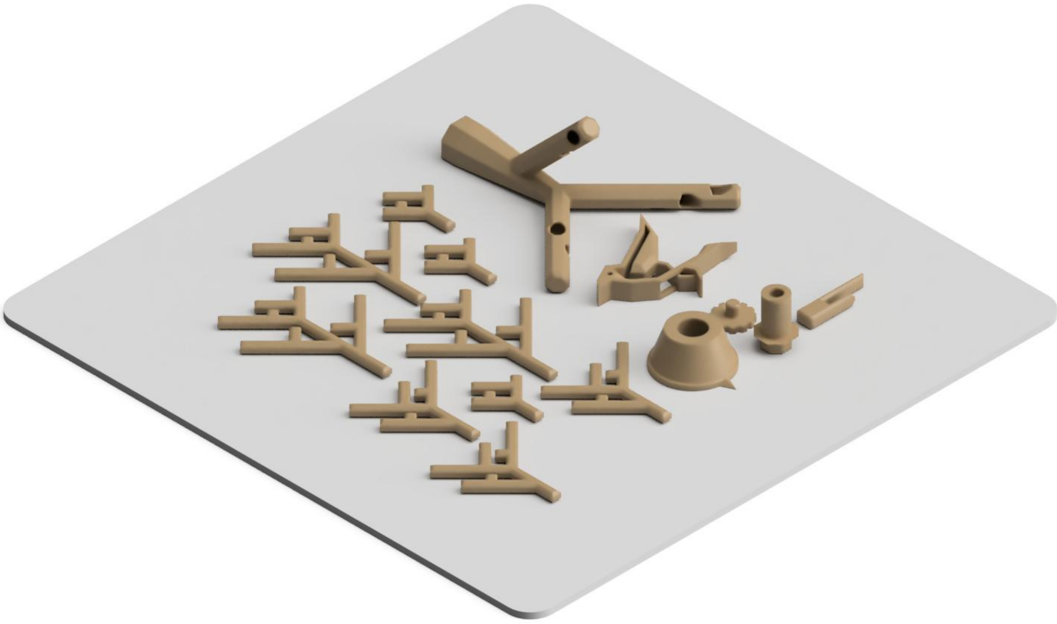


3D Printing

Print 1 of 6



Settings	
Technology	FFF
Material + Recommended Colour	PLA - Dark Brown
Nozzle Dlameter	0.4mm
Layer Height	0.2mm
Infill	15%
Support	None

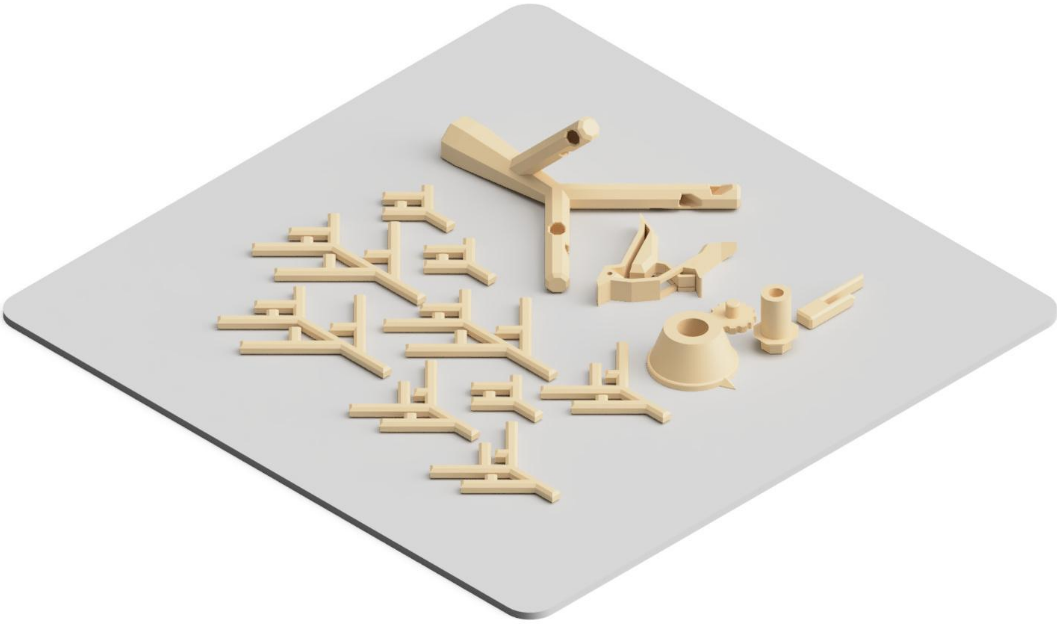
Included Parts

1 x Tree, 3 x Twig - Small, 3 x Twig - Medium, 3 x Twig - Large, 1 x Bird, 1 x Score Tracker, 1 x Spinner - Axle, 1 x Spinner - Main Body, 1 x Spinner - Cap

Statistics	
Print Time	1hr 20min
Material Required	31g

3D Printing

Print 2 of 6



Settings	
Technology	FFF
Material + Recommended Colour	PLA - Light Brown
Nozzle DIameter	0.4mm
Layer Height	0.2mm
Infill	15%
Support	None

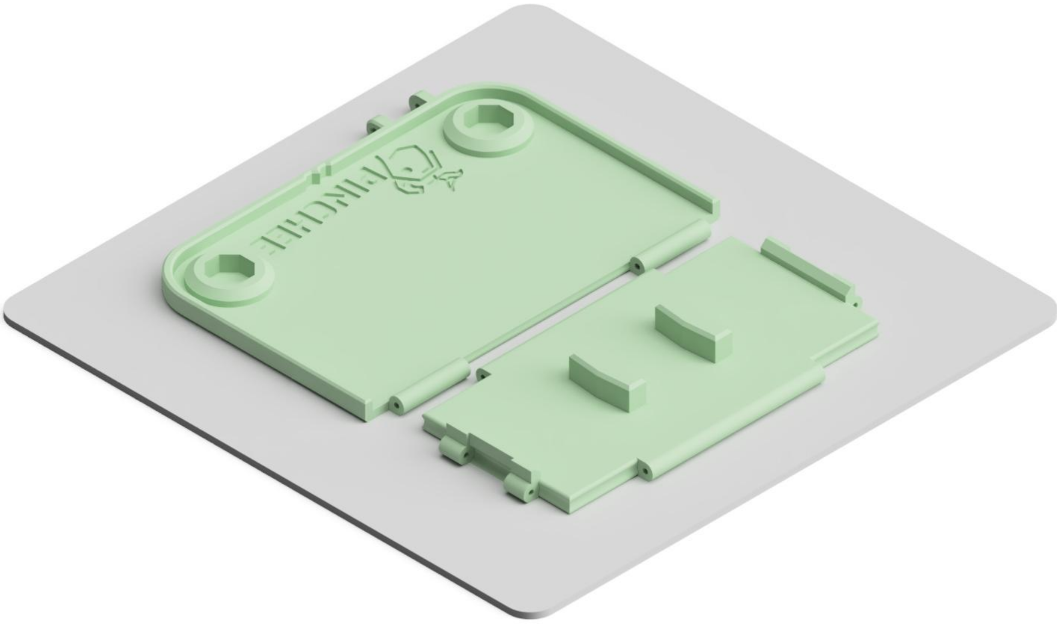
Included Parts

1 x Tree, 3 x Twig - Small, 3 x Twig - Medium, 3 x Twig - Large, 1 x Bird, 1 x Score Tracker, 1 x Spinner - Axle, 1 x Spinner - Main Body, 1 x Spinner - Cap

Statistics	
Print Time	1hr 20min
Material Required	31g

3D Printing

Print 3 of 6



Settings	
Technology	FFF
Material + Recommended Colour	PLA - Green
Nozzle DIameter	0.4mm
Layer Height	0.2mm
Infill	15%
Support	None

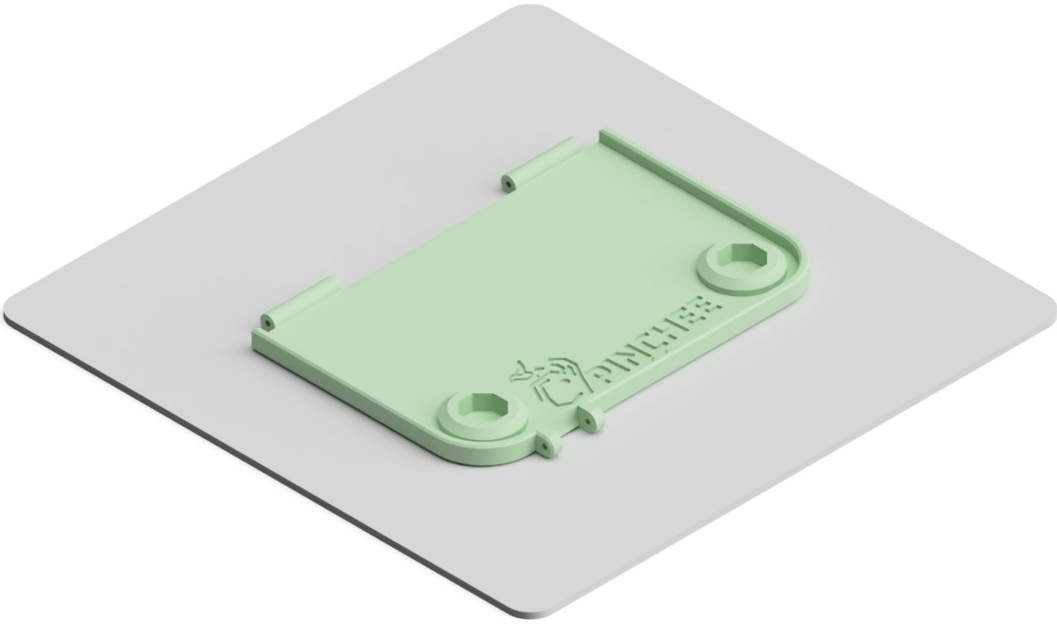
Included Parts

1 x Base, 1 x Tray

Statistics	
Print Time	2hr 29min
Material Required	98g

3D Printing

Print 4 of 6



Settings	
Technology	FFF
Material + Recommended Colour	PLA - Green
Nozzle DIameter	0.4mm
Layer Height	0.2mm
Infill	15%
Support	None

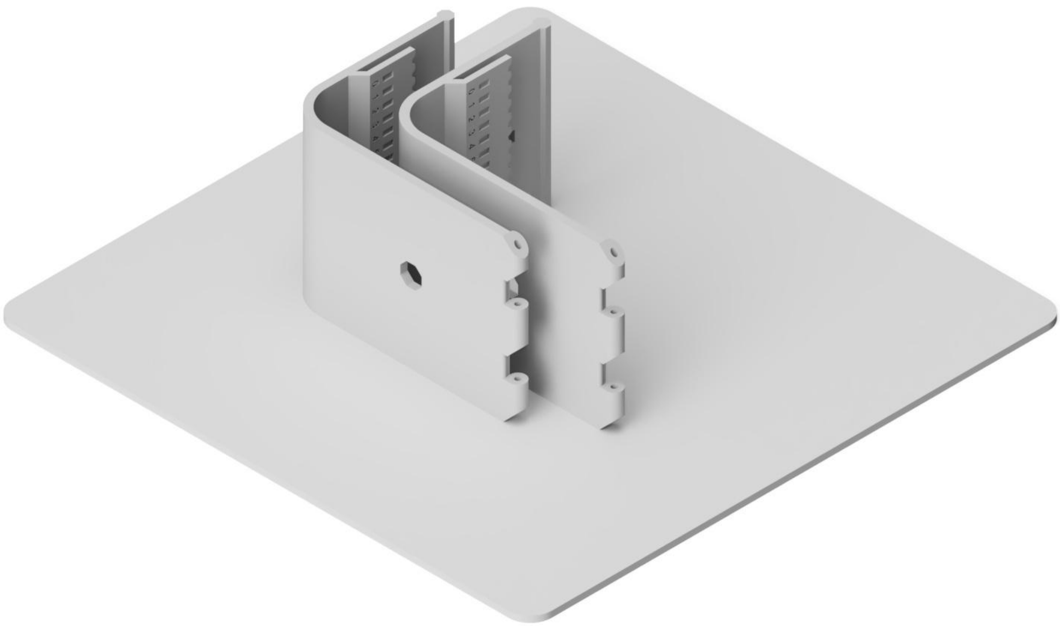
Included Parts

1 x Tray

Statistics	
Print Time	1hr 29min
Material Required	55g

3D Printing

Print 5 of 6



Settings	
Technology	FFF
Material + Recommended Colour	PLA - Grey
Nozzle DIameter	0.4mm
Layer Height	0.2mm
Infill	15%
Support	None

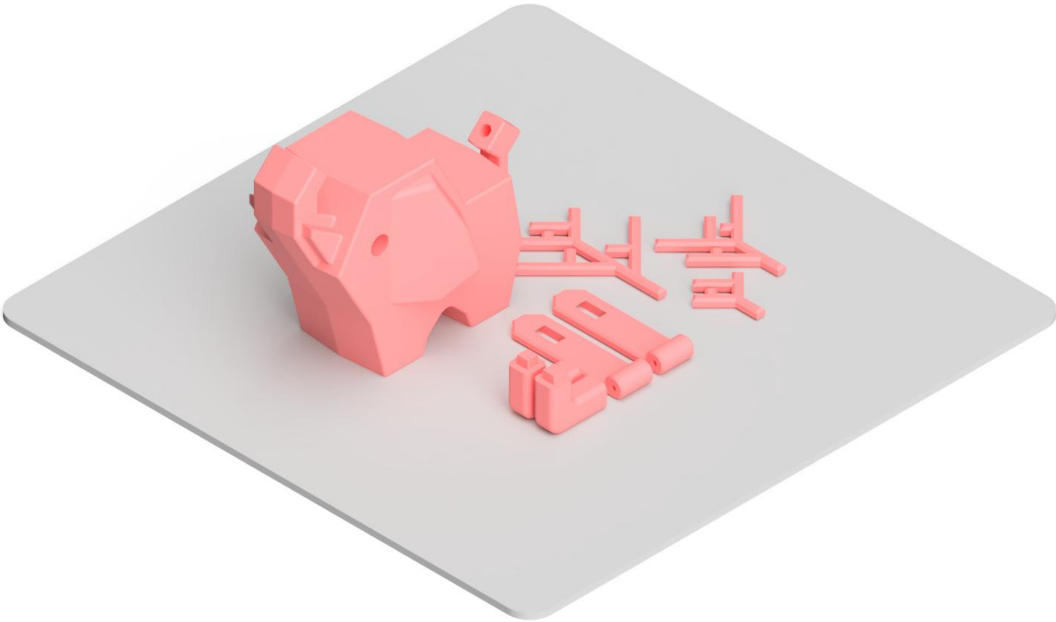
Included Parts

2 x Scoreboard

Statistics	
Print Time	2hr 29min
Material Required	87g

3D Printing

Print 6 of 6



Settings	
Technology	FFF
Material + Recommended Colour	PLA - Red
Nozzle DIameter	0.4mm
Layer Height	0.2mm
Infill	15%
Support	None

Included Parts

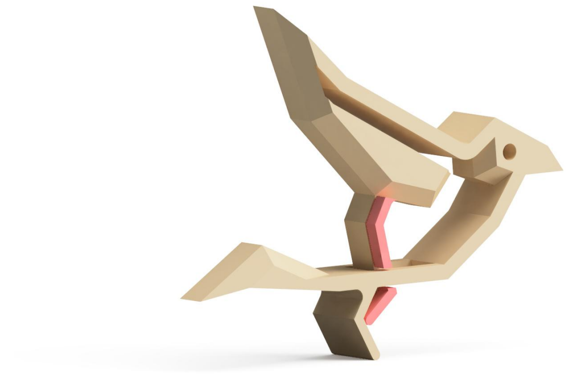
1 x Elephant, 1 x Twig - Small, 1 x Twig - Medium, 1 x Twig - Large, 2 x Latch, 2 x Suitcase Handle

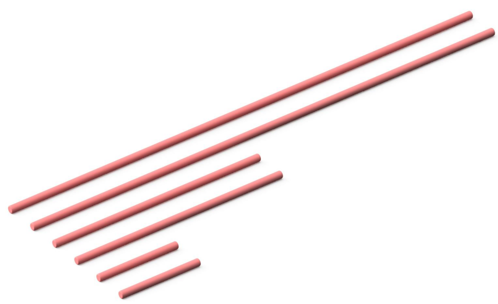
Statistics	
Print Time	2hr 1min
Material Required	79g

Post Processing

Tear off Supports

Although Pinchee did not require supports to be enabled during the 3D printing process, there are pre-built supports designed into the birds. These are highlighted in red on the image opposite, and should be torn/snapped off.

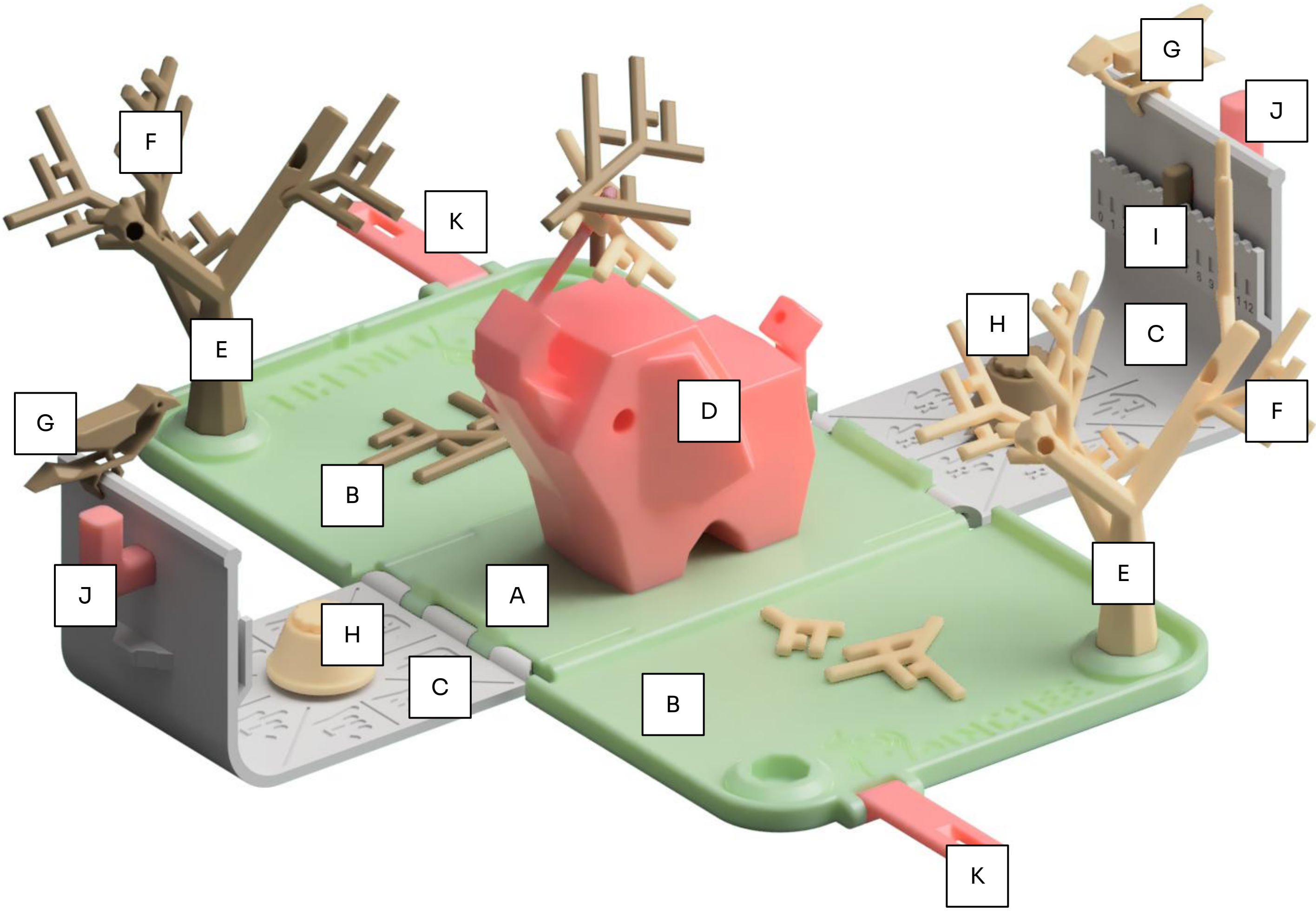




Cut Filament Strands

The gameboard folds up into a suitcase and this is made possible through a series of hinges that use 1.75mm filament strands as the axles. Take any filament and cut 2 x 135mm strands, 2 x 60mm strands, and 2 x 23mm strands. Straighten each strand out as much as possible using your hands.

Assembly

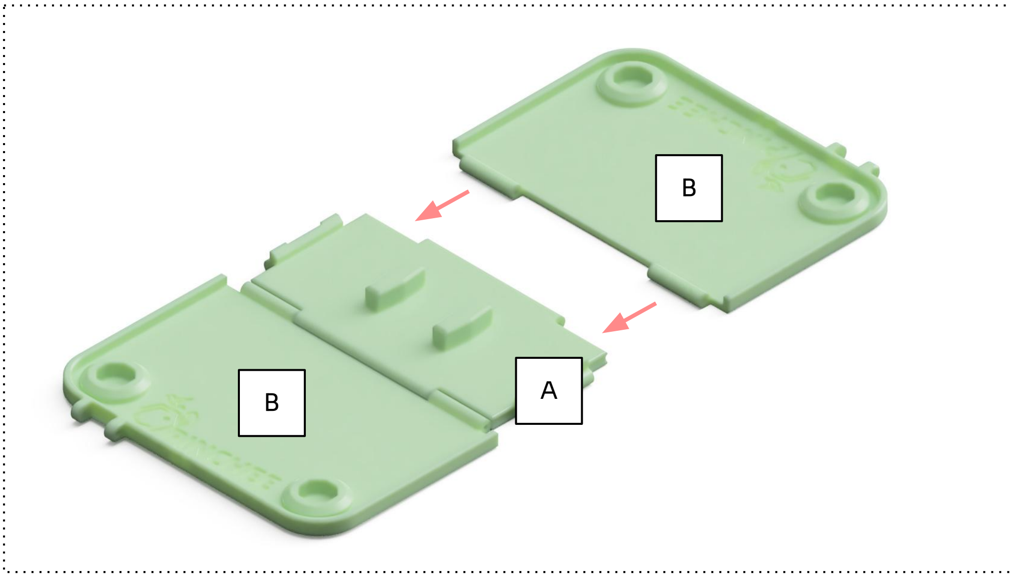


A	Base
B	Tray
C	Scoreboard
D	Elephant
E	Tree
F	Twigs (Small + Medium + Large)

G	Bird
H	Spinner (Axle + Main Body + Cap)
I	Score Tracker
J	Suitcase Handle
K	Latch

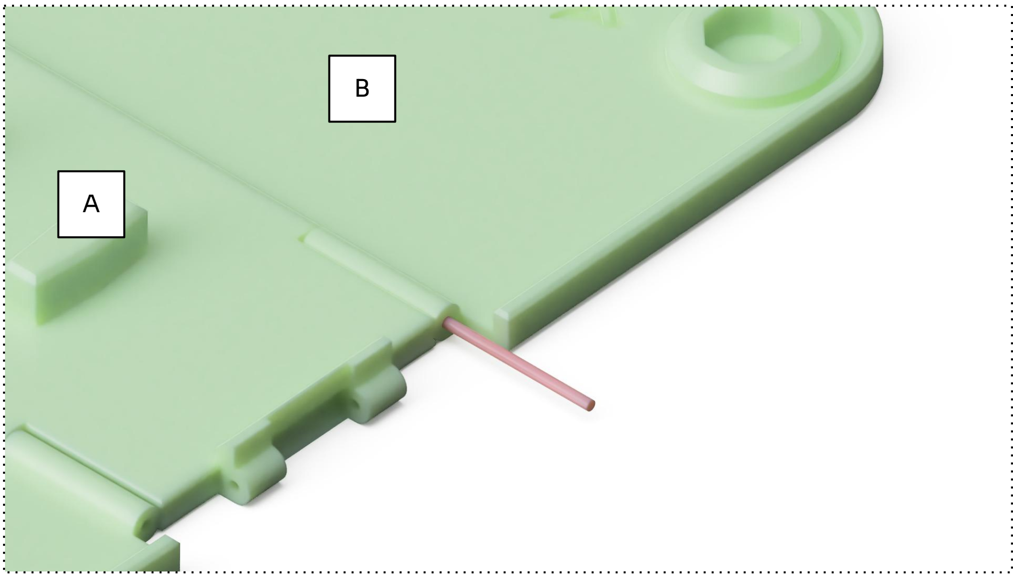
Step 01

Place the Base on a flat surface and attach a Tray to either side.



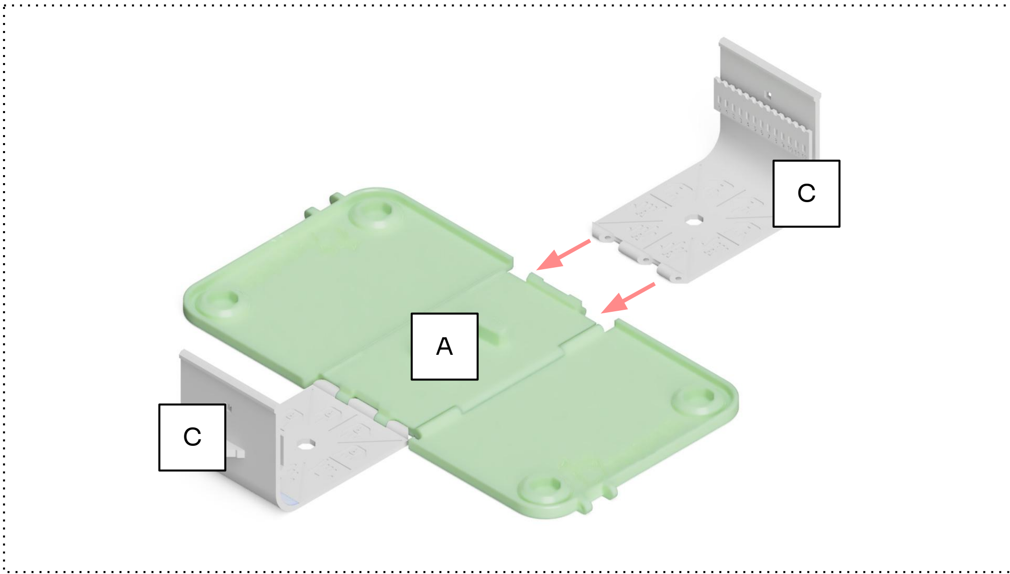
Step 02

Slide 135mm Filament Strands through the hinge holes to connect both trays to the base. If the holes are too tight, widen them with a 2mm screwdriver/drill bit. If they are too loose and don't remain in position, wrap tape around the strands to create friction in the hinges.



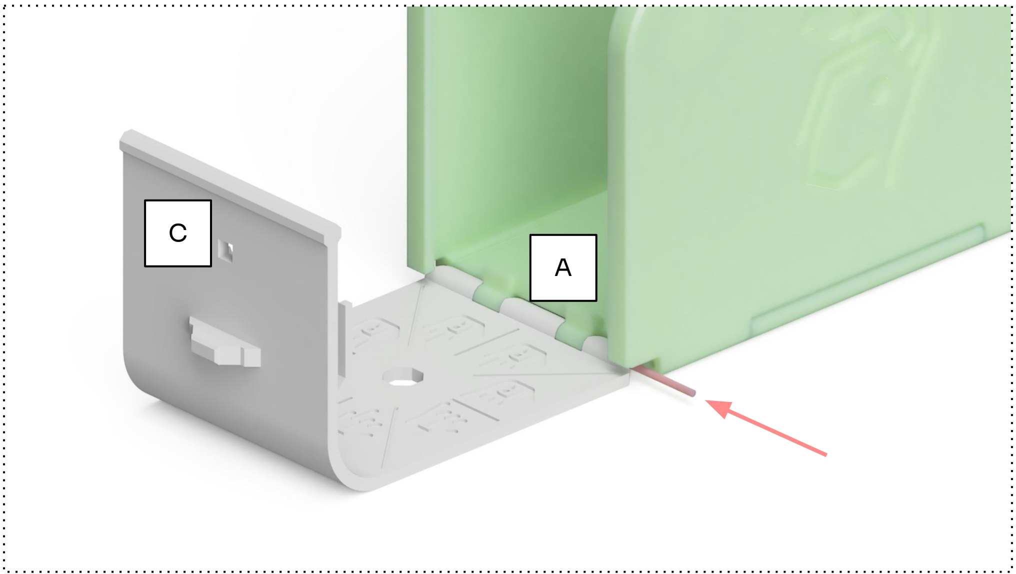
Step 03

Attach a Scoreboard to each side of the Base.



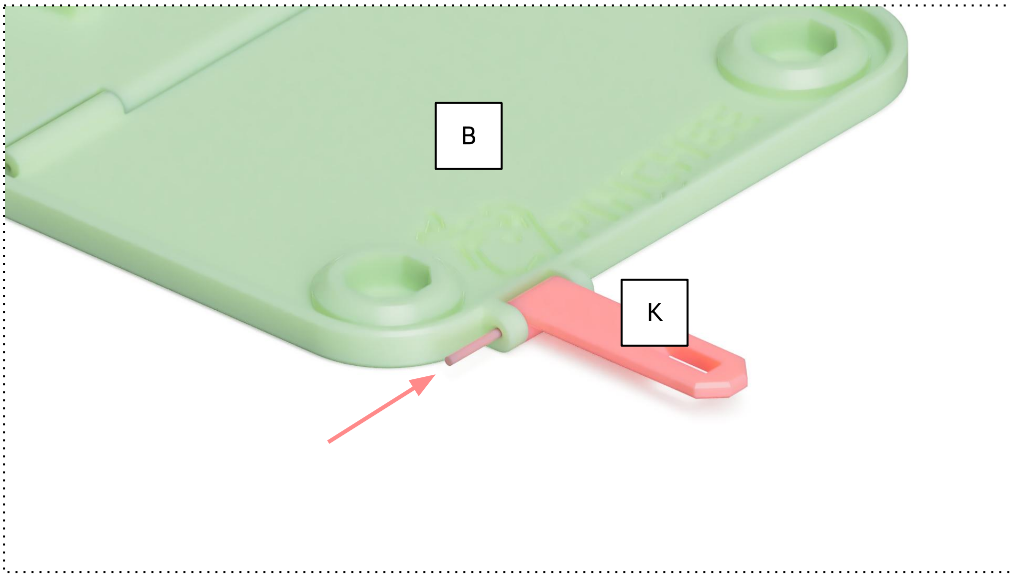
Step 04

Slide 60mm Filament Strands through the hinge holes to connect both scoreboards to the base. To do this, firstly fold up the Trays to give you access to the hinge holes.



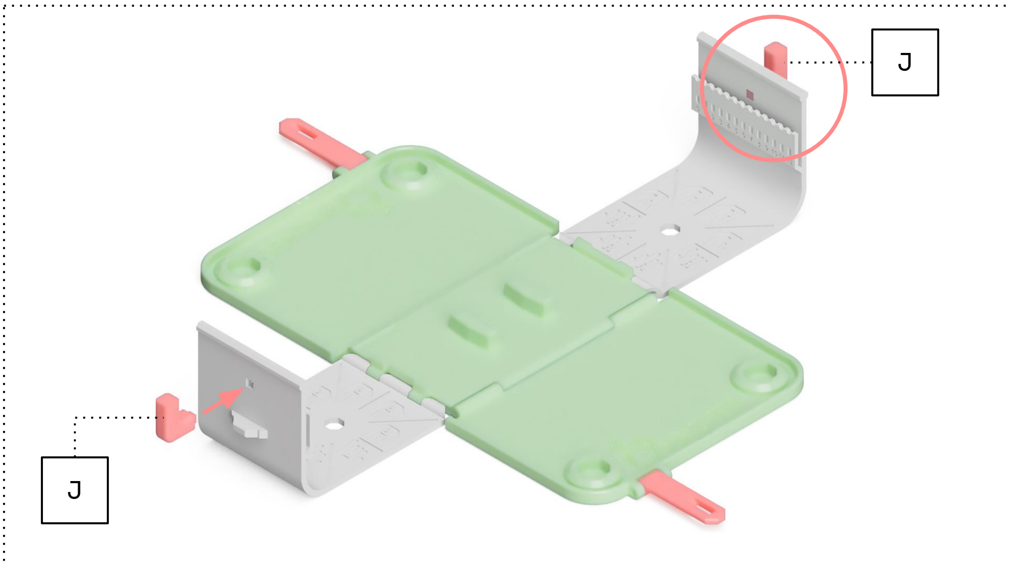
Step 05

Fold the Trays back down and connect a Latch to each one using 23mm Filament Strands.



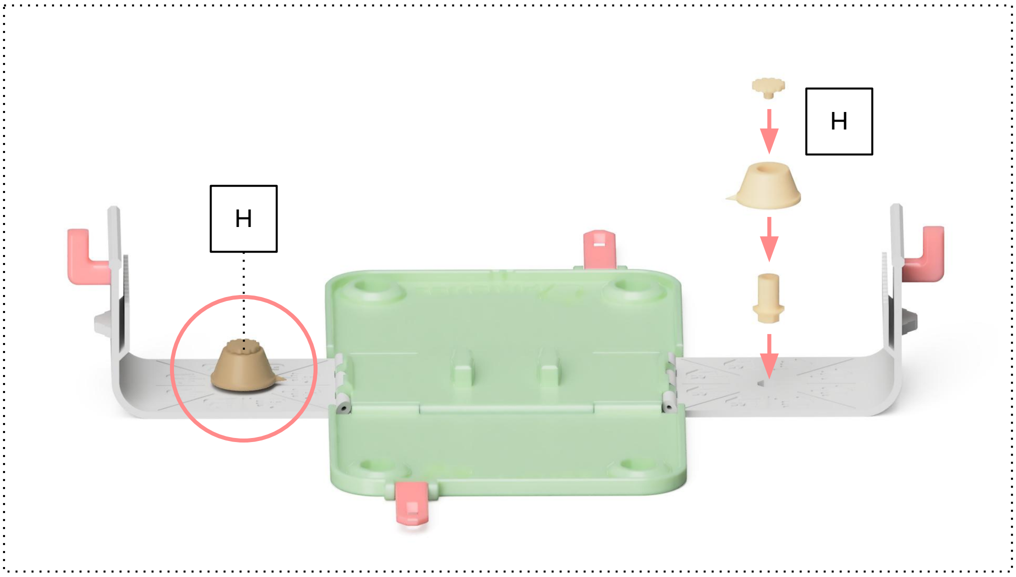
Step 06

Press a Suitcase Handle into the slot on each Scoreboard. If the hole is too tight, sand down the connector. If the connection is loose, apply some glue around the connector to secure it in position.



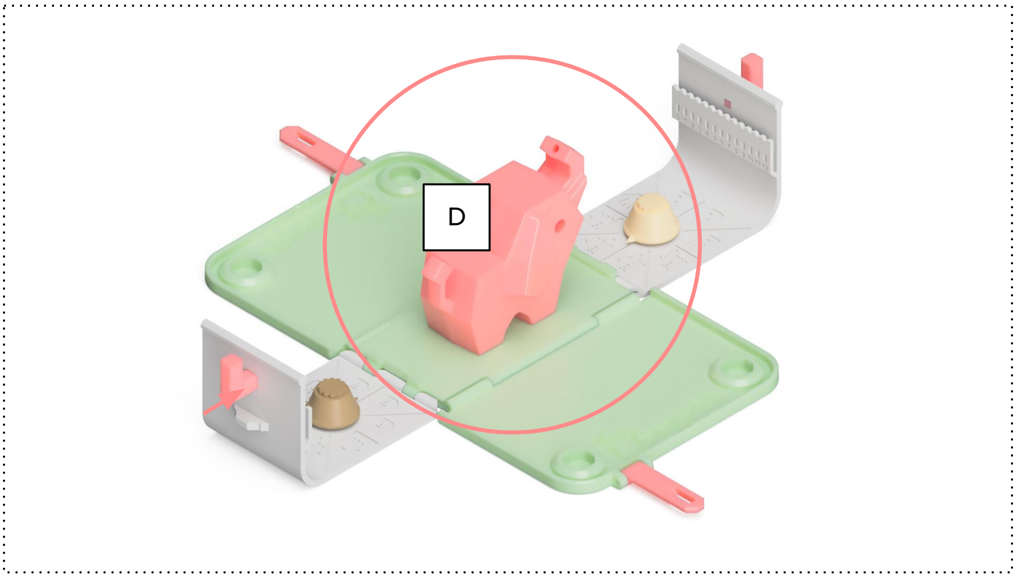
Step 07

Press an Axle into the Scoreboard and place a Main Body on top. Secure this in place by pressing a Cap into the top of the axle. Repeat this for the other scoreboard.



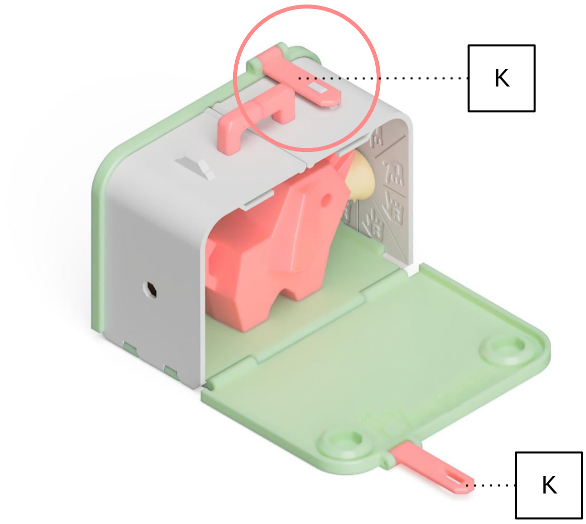
Step 08

Place the Elephant in the centre of the Base by matching the holes in the feet with the extrusions on the base.



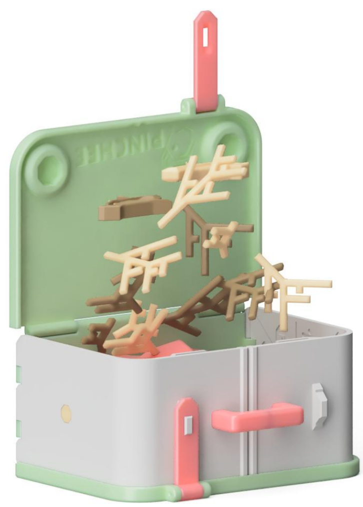
Step 09

Fold up the Scoreboards and one Tray. Secure them in position by attaching the Latch.



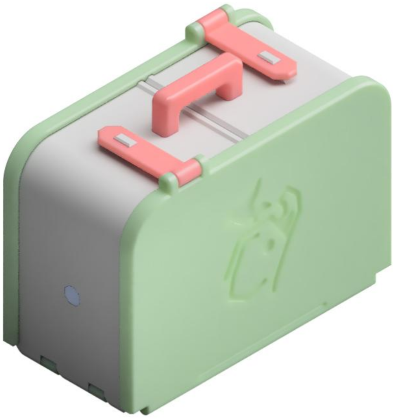
Step 10

Place the suitcase so that the open side is facing upwards. Then pour in all the remaining game pieces. We recommend placing the Trees in first, as they are the trickiest to fit in!



Step 11

With all the parts inserted into the suitcase, you can close it up until you're ready to play!



Step 12

To play the game, unfold the suitcase and follow the Game Instructions document.

Game Instructions

Once Pinchee is assembled, you can use the accompanying Game Instructions document to gain a thorough understanding of the rules before enjoying the game!

Watch the Pinchee Overview Video

https://youtu.be/l-7xn86mphg?si=8g7MvwxobYHC7FgH

Evolution

The beauty of 3D printed games is that they can be easily customised and improved on. We'd love to see what adaptions the community can come up with. Here are just a few ideas! We also welcome your feedback and suggestions. Please get in touch at hello@weareprintlab.com.

Twigs

Experiment with new twig designs to make the game easier or harder.

Theme

Switch Pinchee out for a different animal/theme.

Mechanics

Redesign the bird to introduce new mechanics other than pinching.

Rules

Introduce new gameplay rules to mix things up.