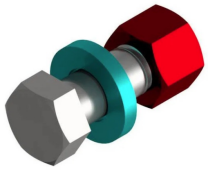

instructables Bolt Nut Puzzle 3D Printed Instruction Manual

Contents

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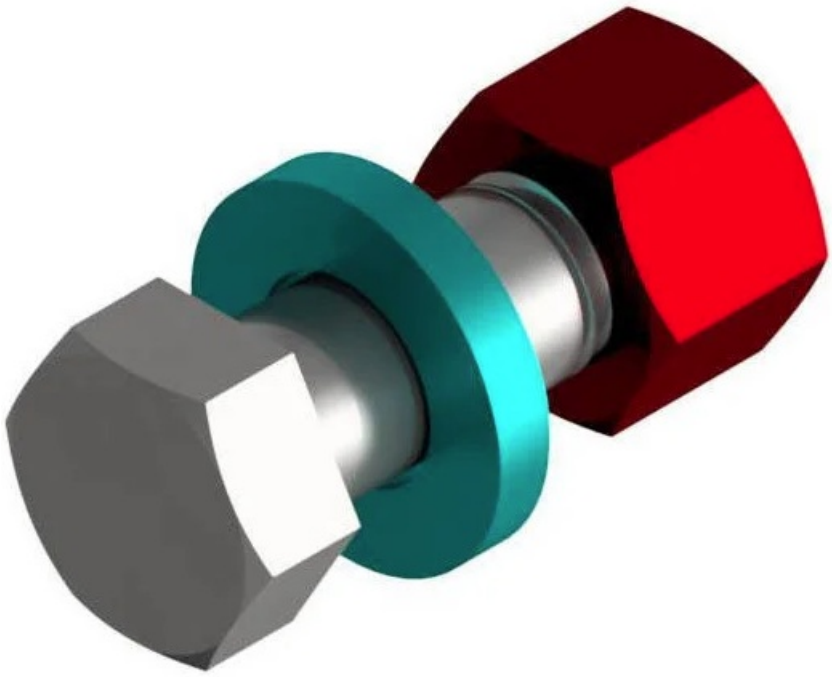
Bolt Nut Puzzle 3D Printed



Bolt-Nut Puzzle – 3D Printed

This is a cool little project that drives everyone who does not know the solution to despair and abandonment! It is a puzzle that consists of a bolt, a nut, and a rope. The objective of the puzzle is to separate the nut from the bolt without removing the bolt from the rope.

Printing

First, you have to print the following files:

- bolt-nut puzzle_base.stl
- bolt-nut puzzle_bolt_M12x18.stl
- bolt-nut puzzle_nut_M12.stl

The recommended print settings are:

- **Printer brand**: Prusa
- **Printer**: MK3S / Mini
- **Supports**: No
- **Resolution**: 0.2 in
- **Fill**: 15% for the base; 50% for the nut and bolt
- **Filament brand**: Prusa; ICE; Geetech
- **Filament color**: Galaxy Black; Young Yellow; Silky Silver
- **Filament material**: PLA

Remark: As all parts are designed to fit very precisely, it may happen that you have to rework one or the other part a bit with sandpaper and/or cutter due to different dimensional accuracy of the printers and the different behavior of the filaments.

Assembly

1. Insert the rope through the hole on the left side of the base
2. Insert the nut into the left end of the rope
3. Use a cable tie to secure the left end of the rope about 5mm from the end
4. Insert the bolt into the right end of the rope with the threaded side facing inwards
5. Insert the right end of the rope through the hole on the right side of the base
6. Use a cable tie to secure the right end of the rope about 5mm from the end

Instead of using cable ties, you can tie knots on both ends of the rope and use fabric glue to secure them.

Solution

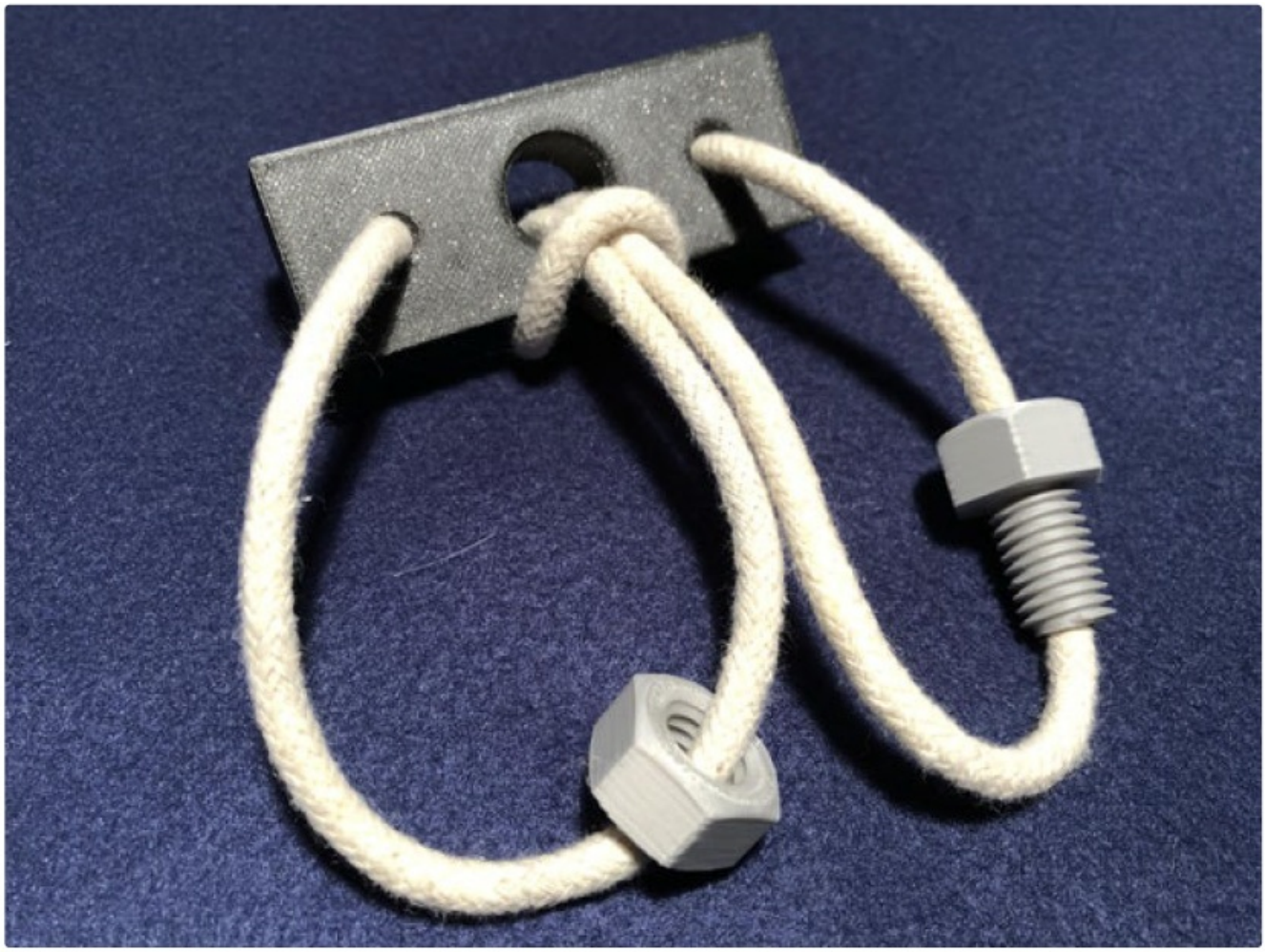
The objective of the puzzle is to separate the nut from the bolt without removing the bolt from the rope. For the solution, you should only move the nut, because due to the size of the screw, the solution process would be more difficult. For a detailed solution, please refer to **https://www.instructables.com/Twin-Nut-Puzzle/**.

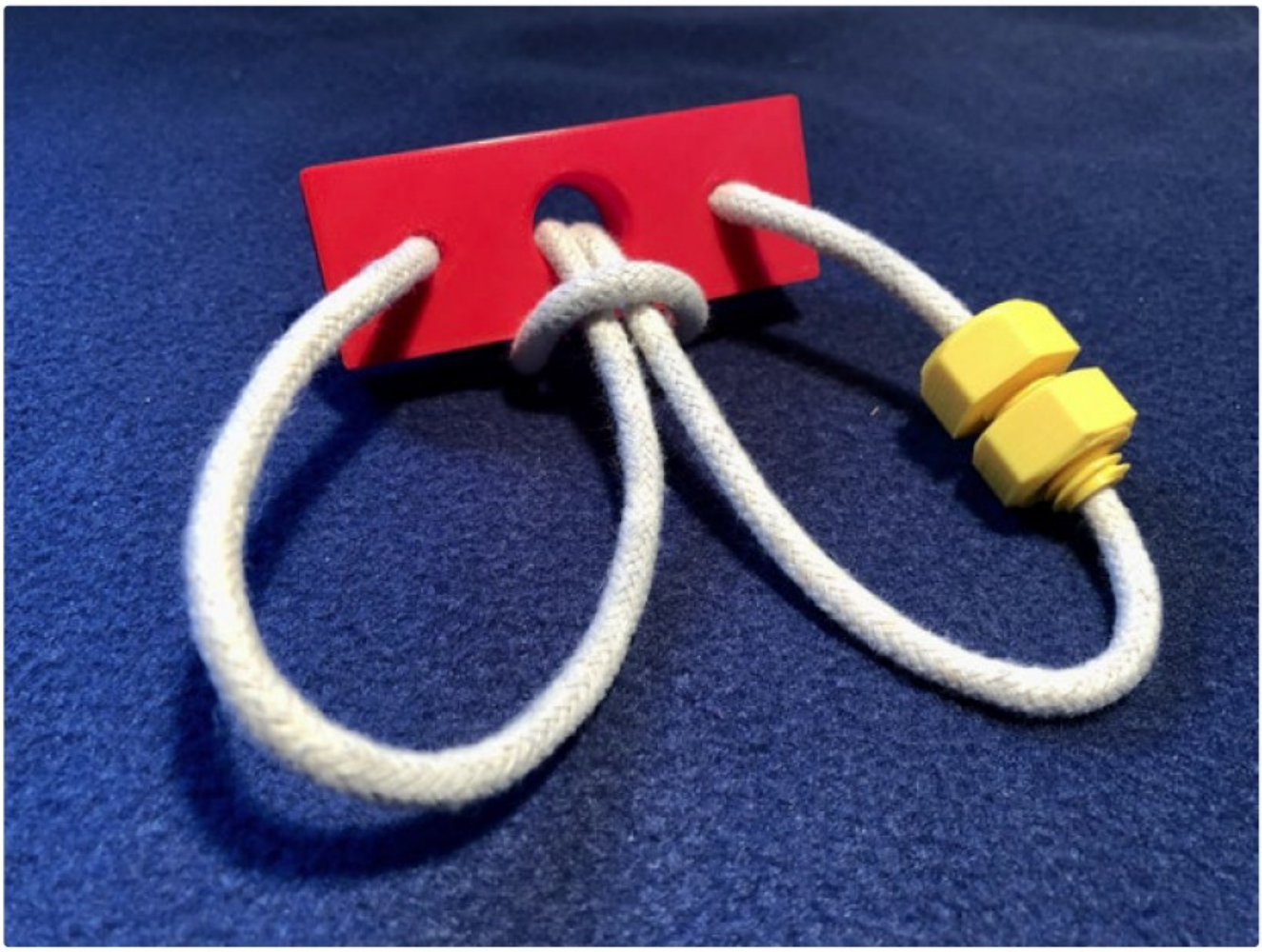
This project is based on the publication **https://www.instructables.com/Twin-Nut-Puzzle/** by AtulV15. Thanks for posting this nice little project! It drives everyone who does not know the solution to despair and abandonment! While looking for a little present for a visit to relatives with two kids, ages 8 and 10, I came across the “Twin Nut Puzzle”. The task of the puzzle is to guide the nut along the rope over to the right loop to the screw and then screw it up.

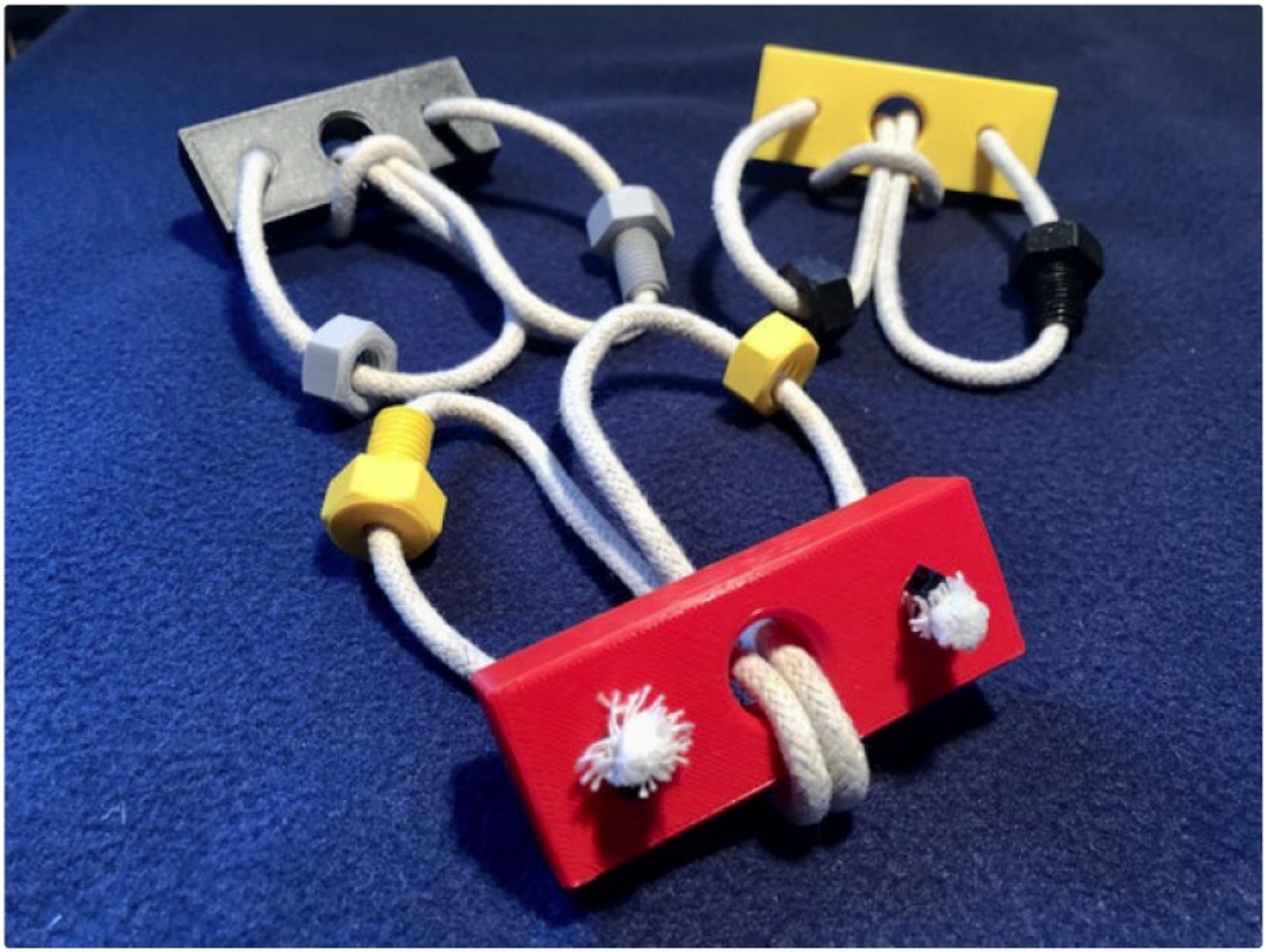
Then I read the comments and saw framakers’ post. I liked the idea of replacing one of the two nuts with a matching screw. I agree that it makes solving the puzzle much more attractive. However, drilling vertically through a metal screw is not everyone’s cup of tea, nor is it easy to do. A good and relatively easy way to solve the problem with the pierced screw is 3D printing … provided you own a 3D printer! To implement the idea, I decided to prepare this small project completely for 3D printing.

Supplies:
For this project you need:

- bolt-nut puzzle_base.stl
- bolt-nut puzzle_bolt_M12x18.stl
- bolt-nut puzzle_nut_M12.stl
- cable ties (2x)
- rope (620 x Ø 4-5 mm)
- pliers or scissors







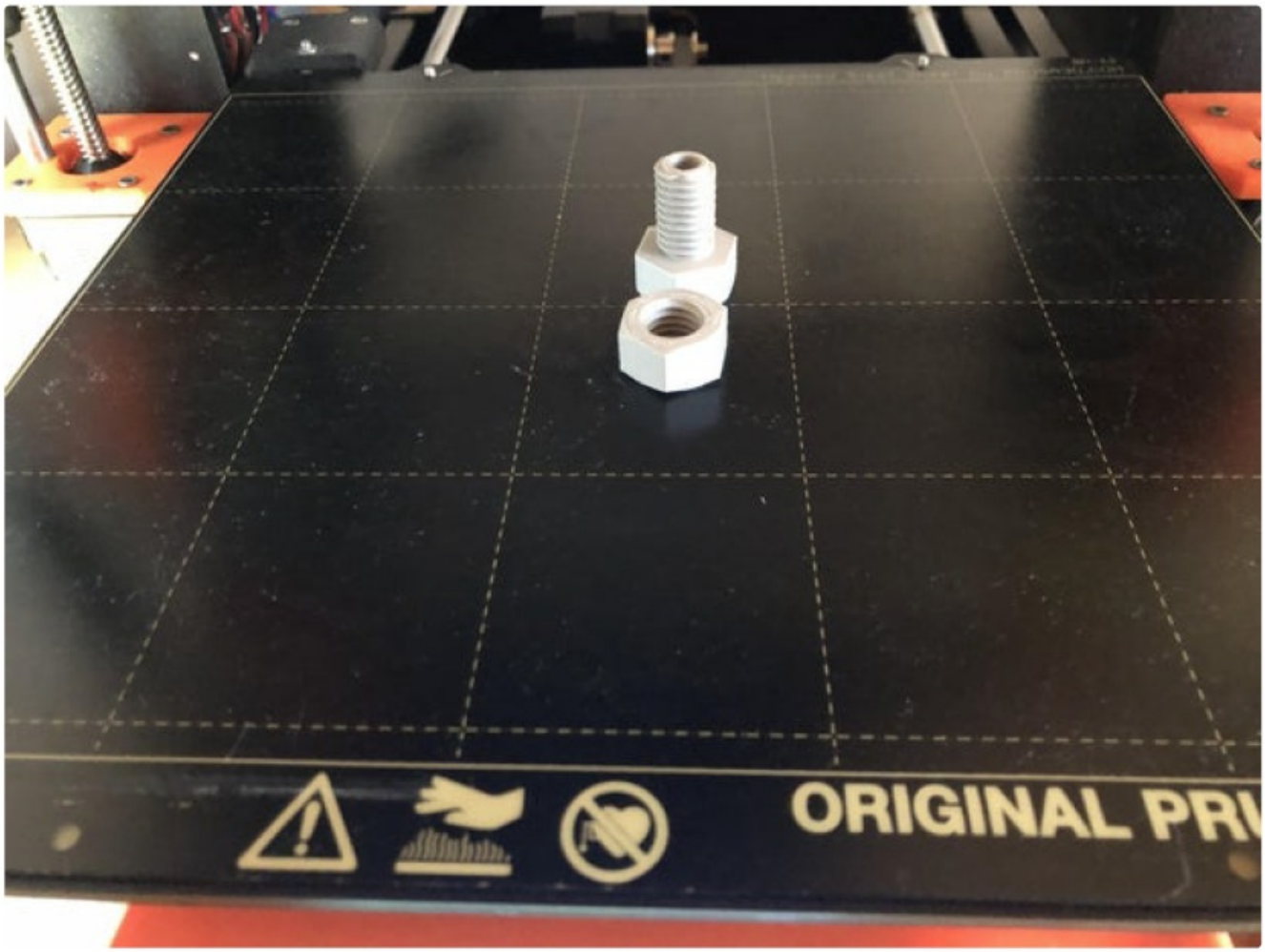
Printing
First you have to print the following files:

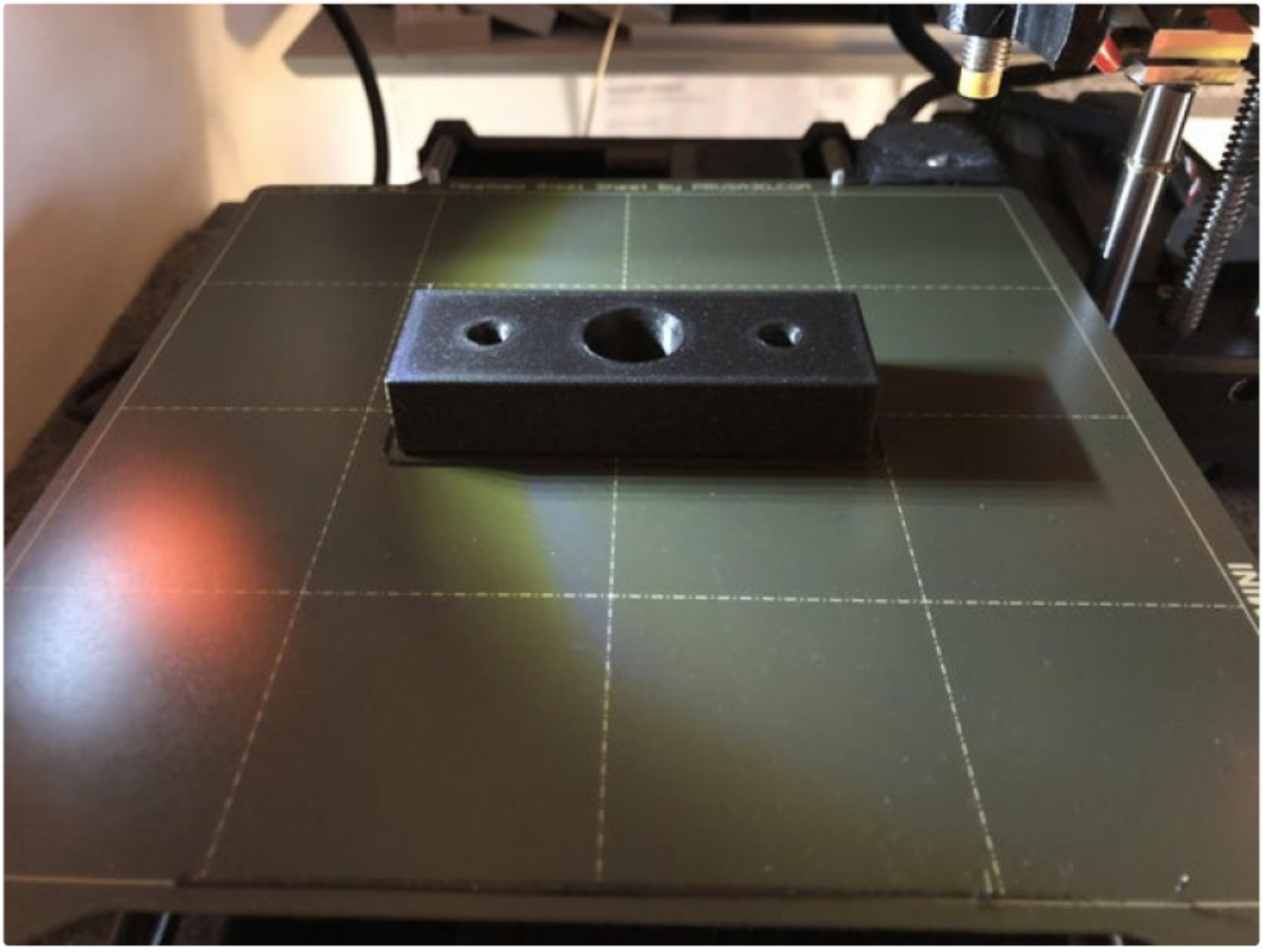
- bolt-nut puzzle_base.stl
- bolt-nut puzzle_bolt_M12x18.stl
- bolt-nut puzzle_nut_M12.stl

Print Settings

- **printer brand**: Prusa
- **printer**: MK3S / Mini
- **supports**: No
- **resolution**: 0,2
- **infill**: 15% ; nut and bolt 50%
- **filament brand**: Prusa; ICE; Geetech
- **filament color**: Galaxy Black; Young Yellow; Silky Silver
- **filament material**: PLA

Remark: As all parts are designed to fit very precisely, it may happen that you have to rework one or the other part a bit with sandpaper and/or cutter due to different dimensional accuracy of the printers and the different behavior of the filaments.



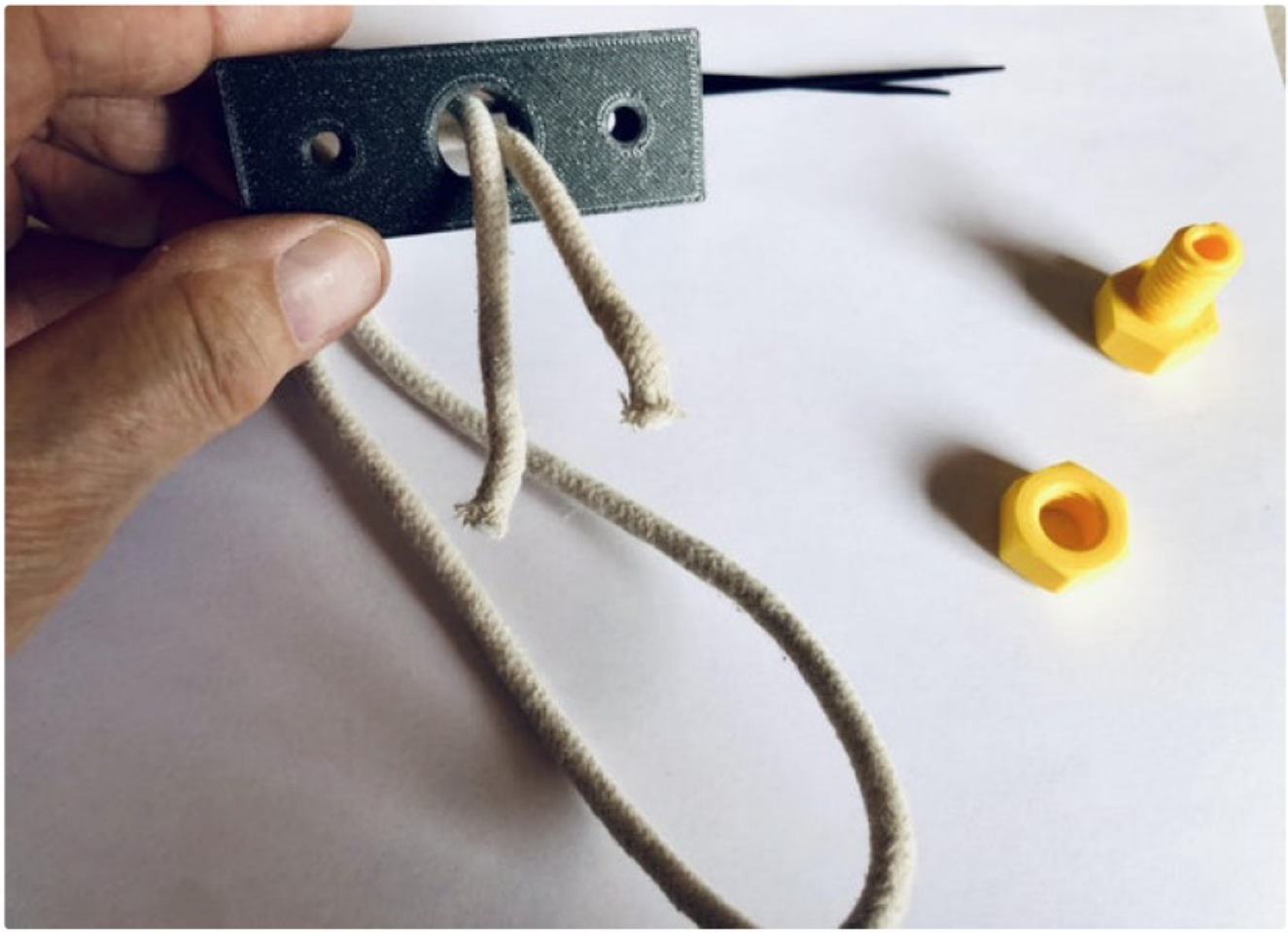


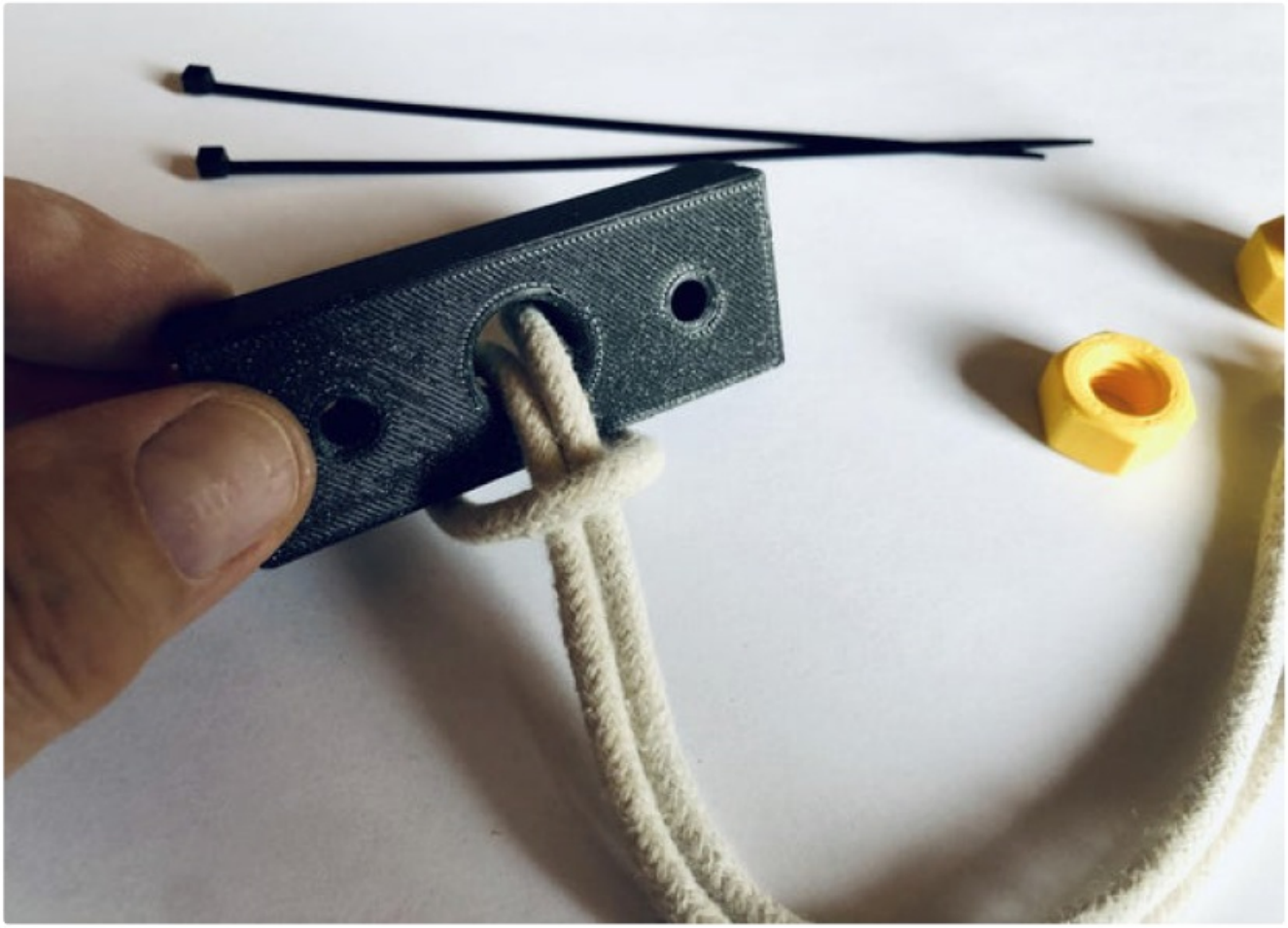
Insert Rope – Secure Ends

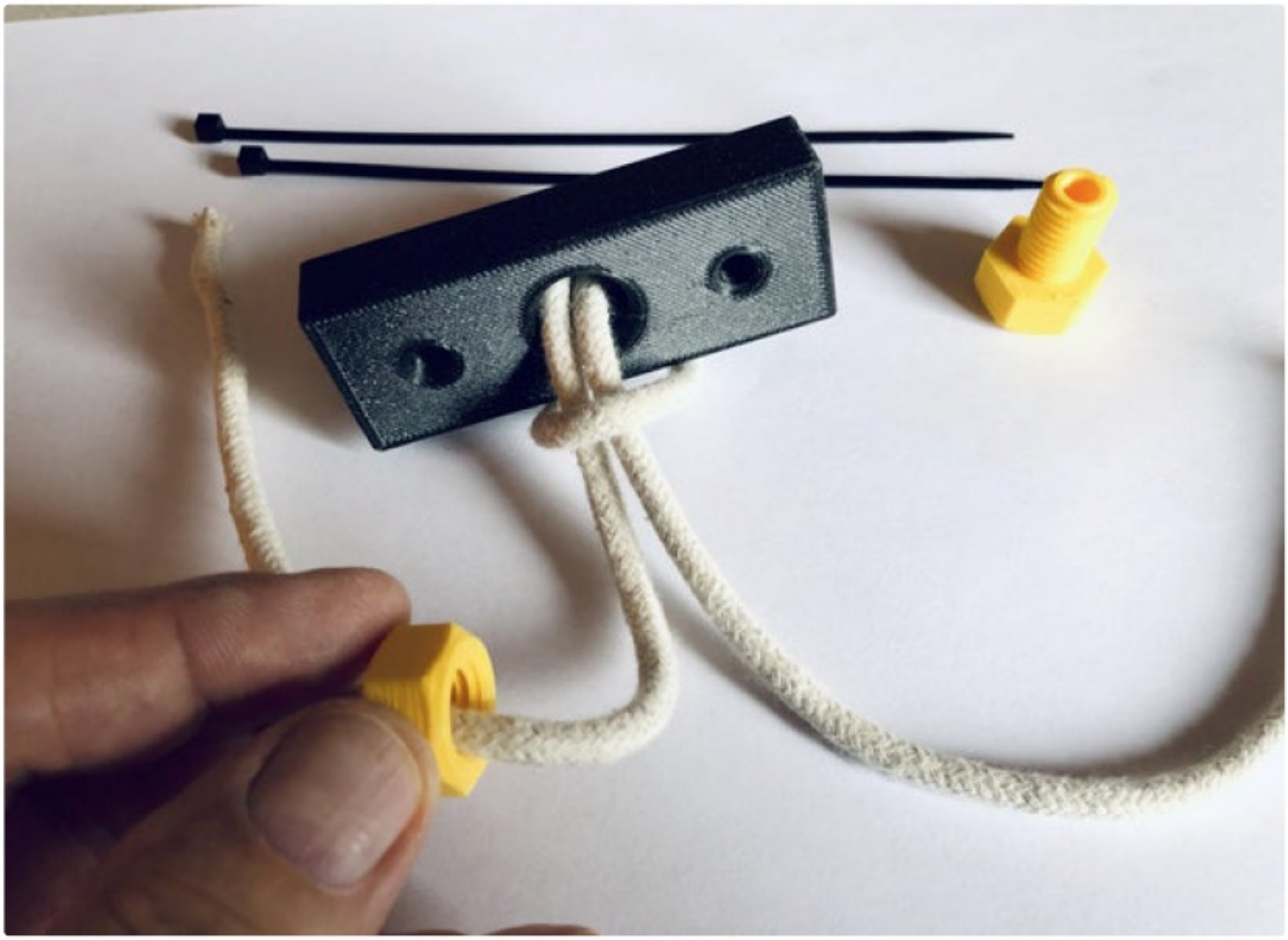
After the three parts are printed, you need for the next step:

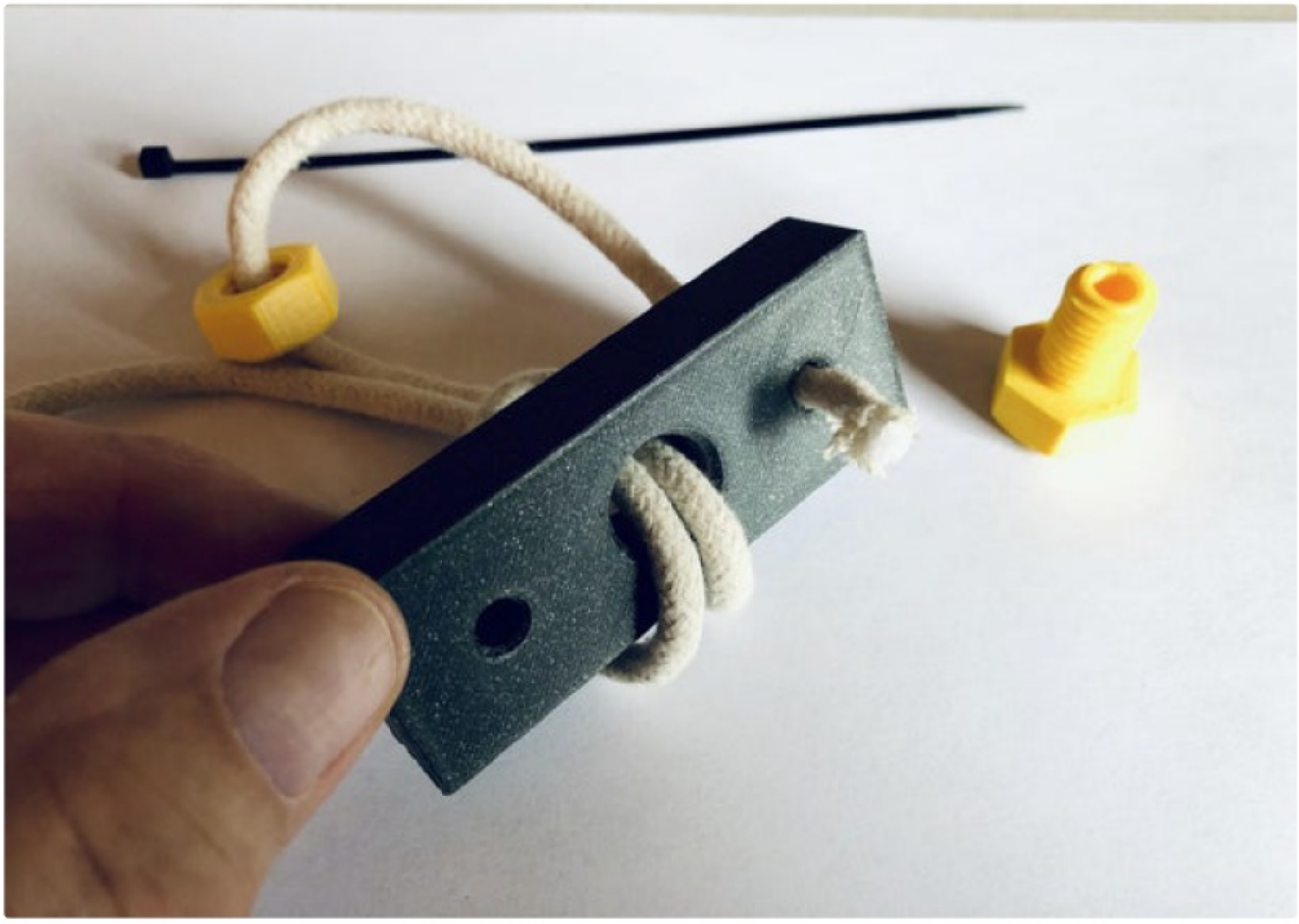
- rope (620 x Ø 4-5 mm)
- cable ties (2x)
- pliers or scissors

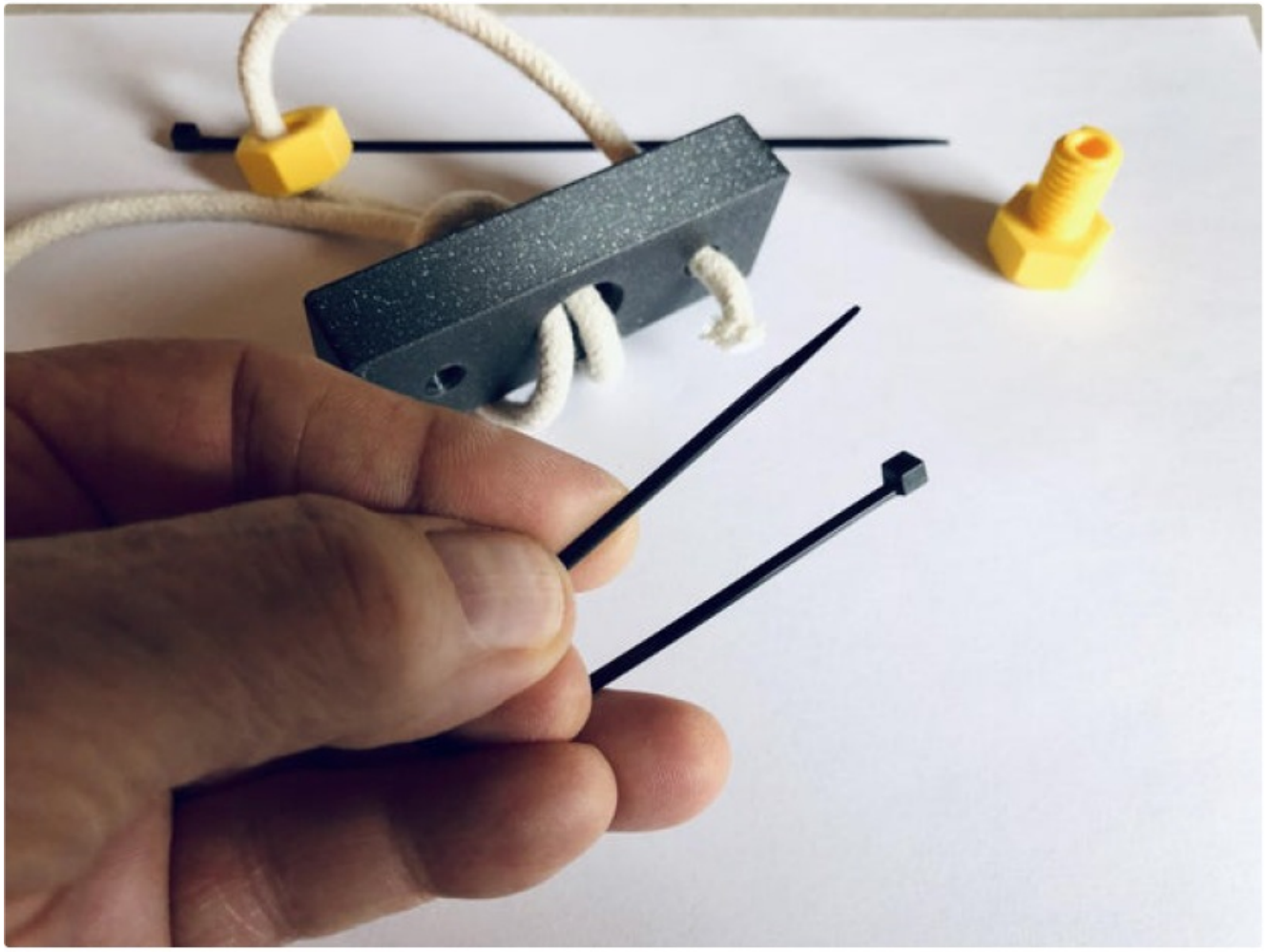
Now you have to insert the rope as shown in the pictures. Before you put the left end of the rope into the left hole, do not forget to insert the nut. Take one of the cable ties. Prepare a loop and place it about 5 mm from the end of the rope and pull it tight. Cut off the long end with pliers or scissors. You can, of course, tie a knot. In that case I would cut the rope about 3-6 cm longer, depending on how thick the rope is. Next you need to put the bolt on the right side of the rope. Make sure that you insert it with the threaded side. The screw head must be oriented to the base. Then – as on the left side – insert the end of the right rope into the right hole and secure the end again with a cable tie. That’s it!

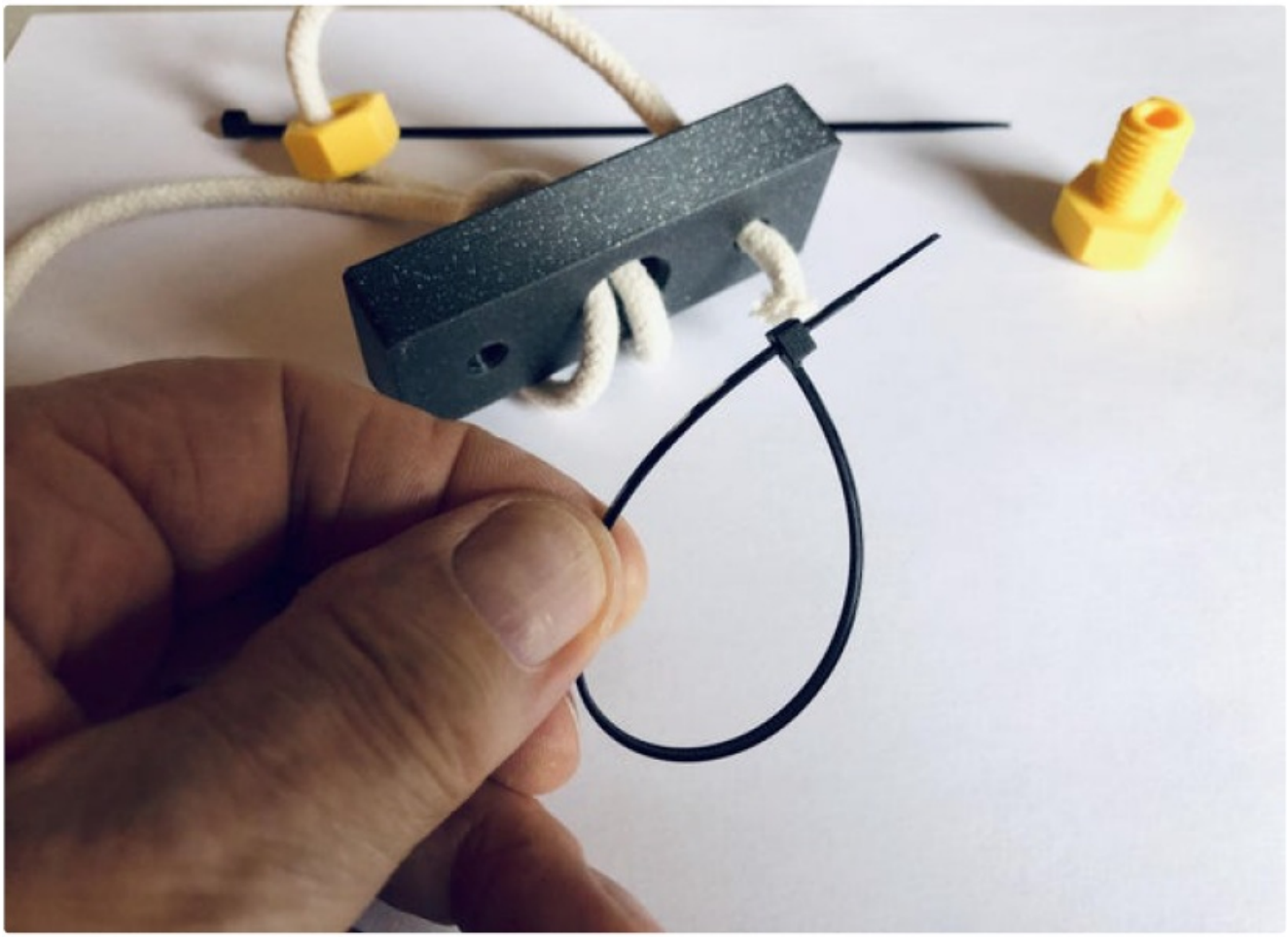


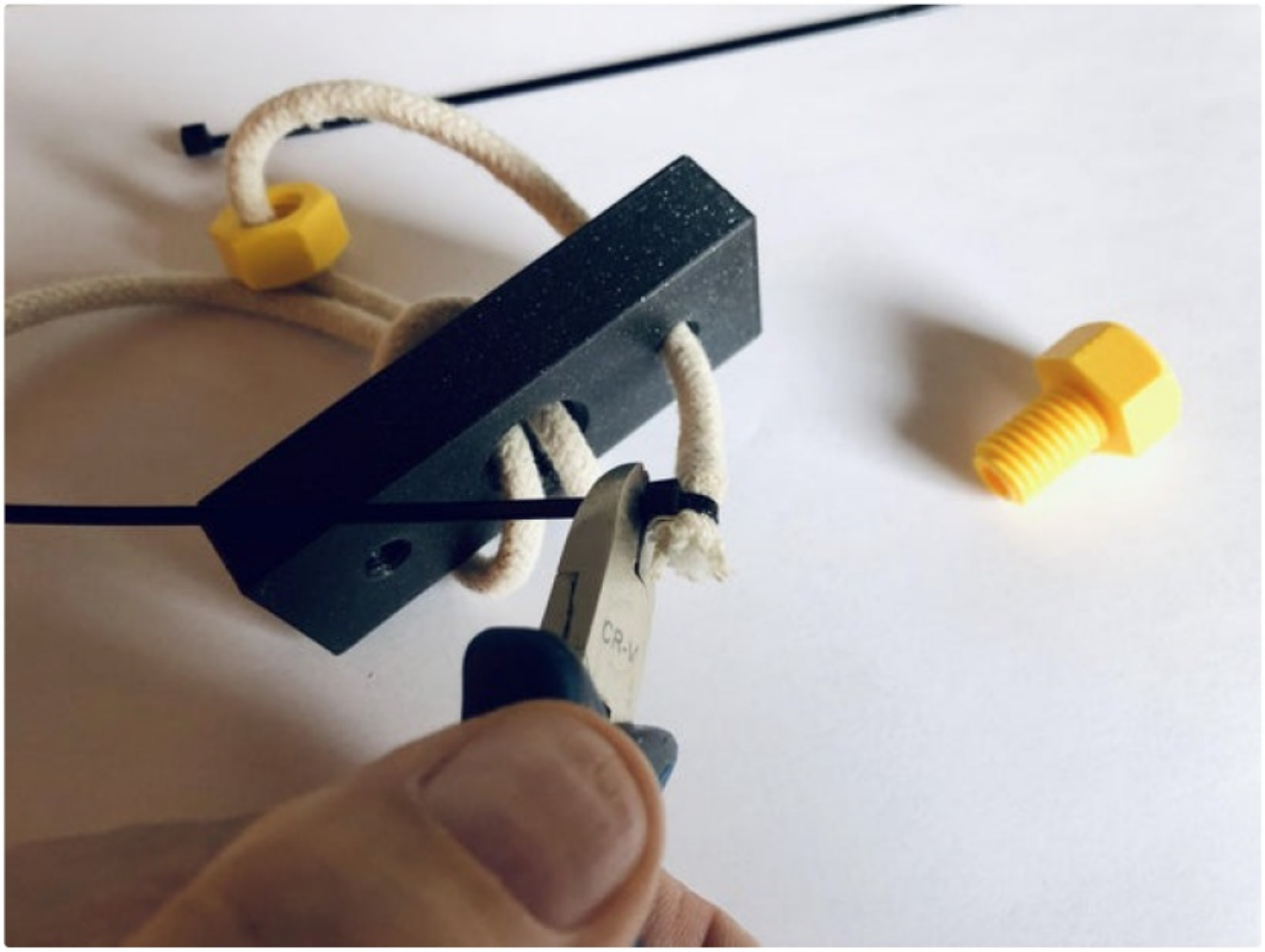


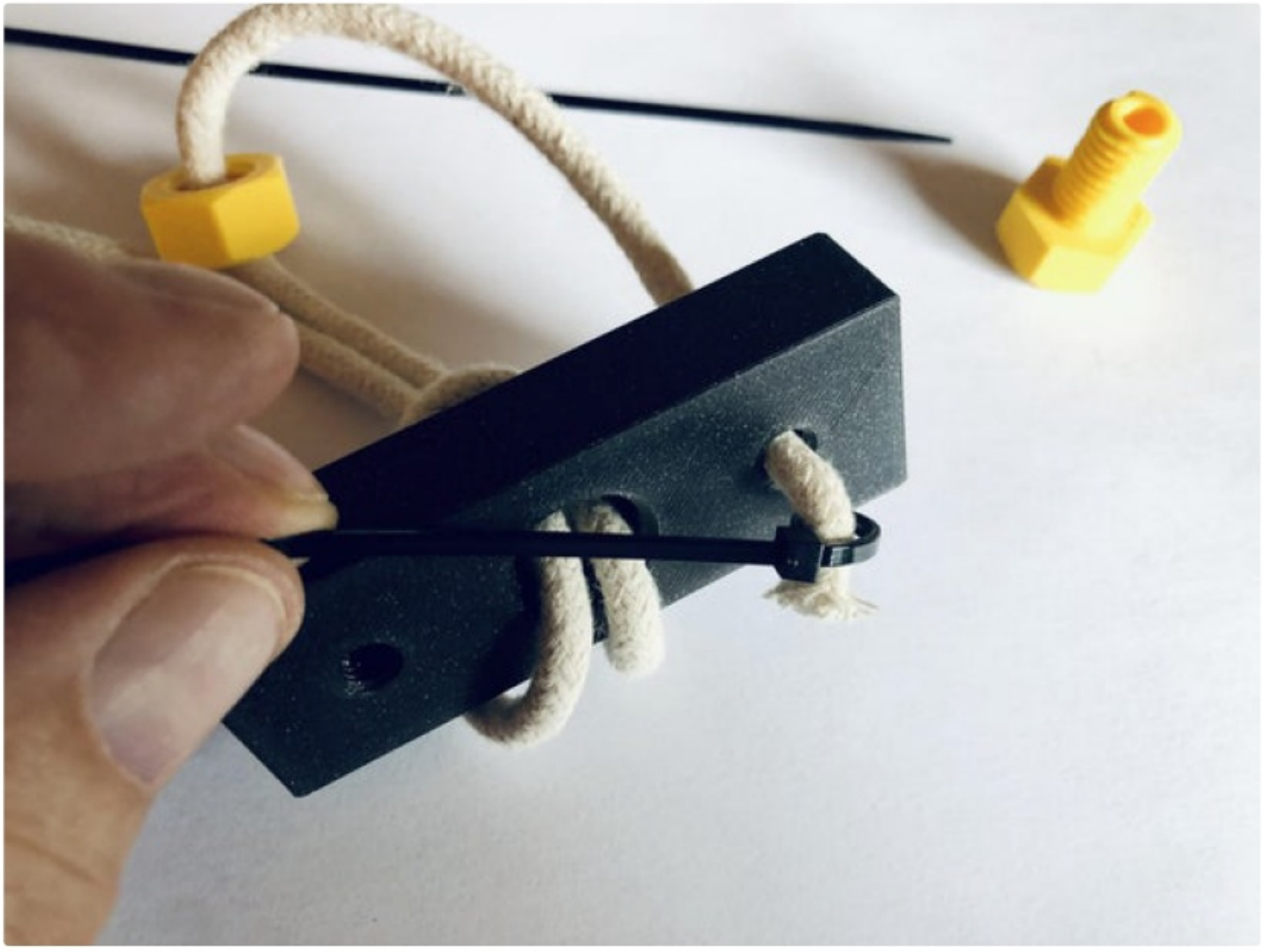


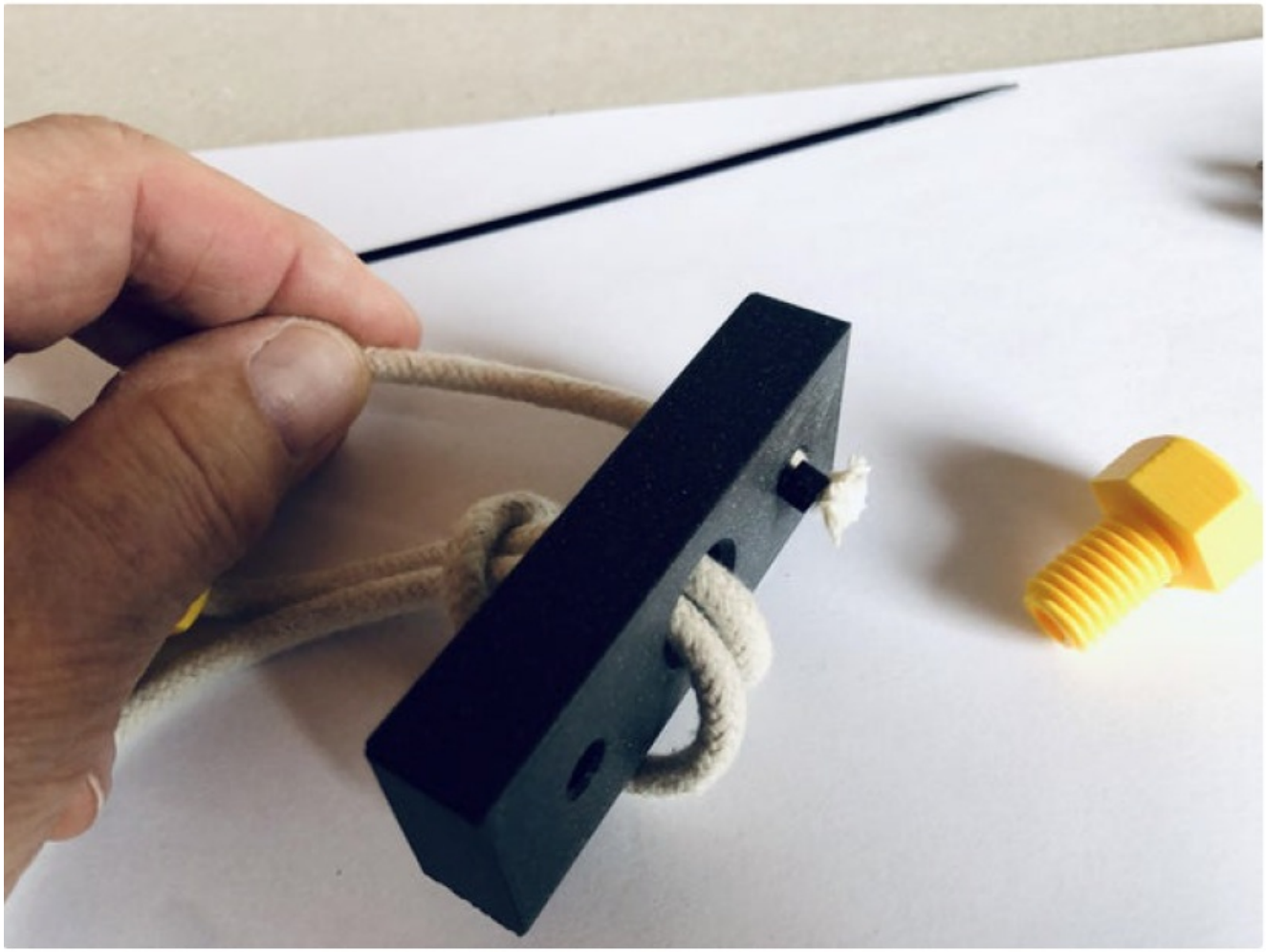


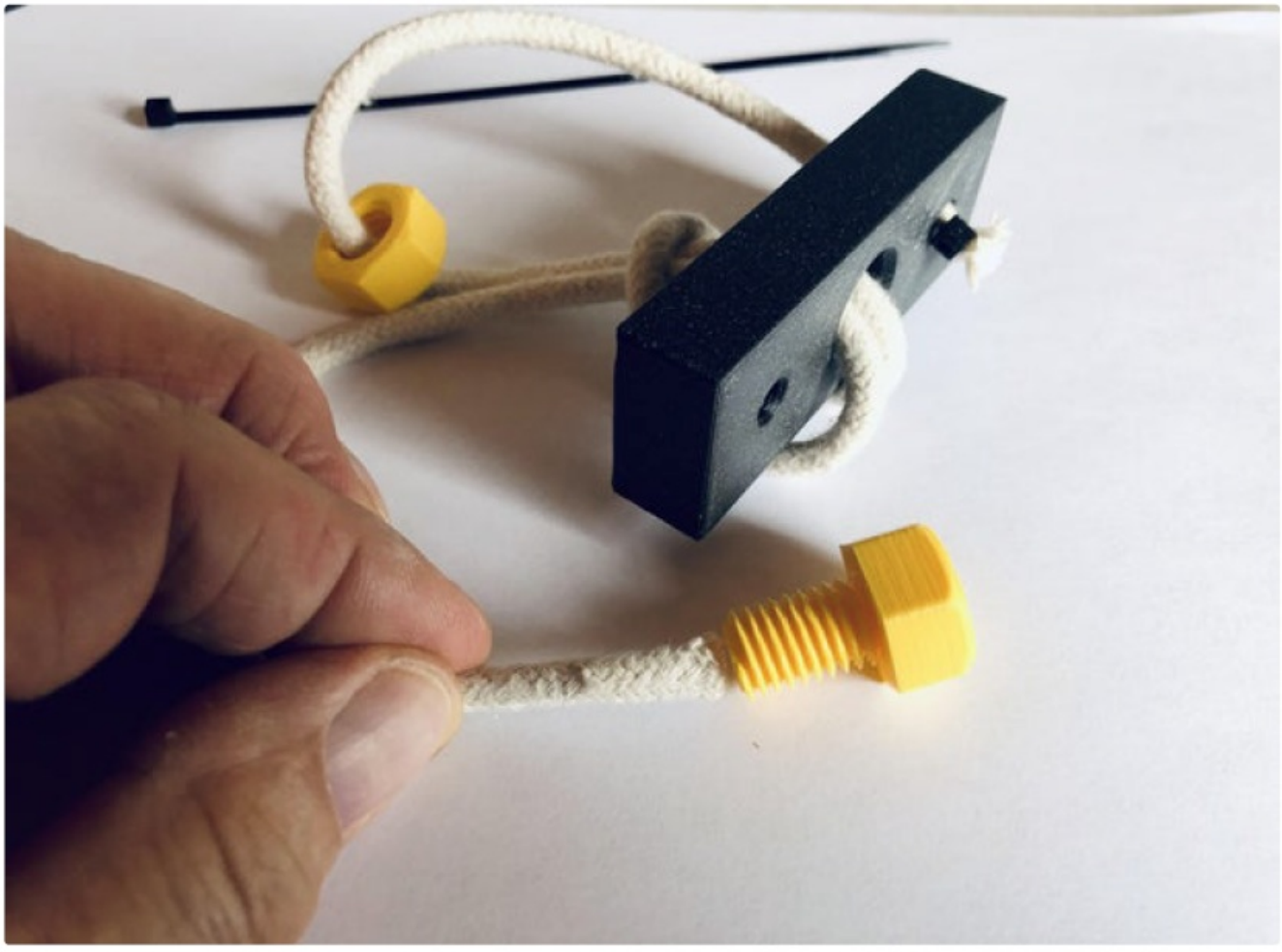


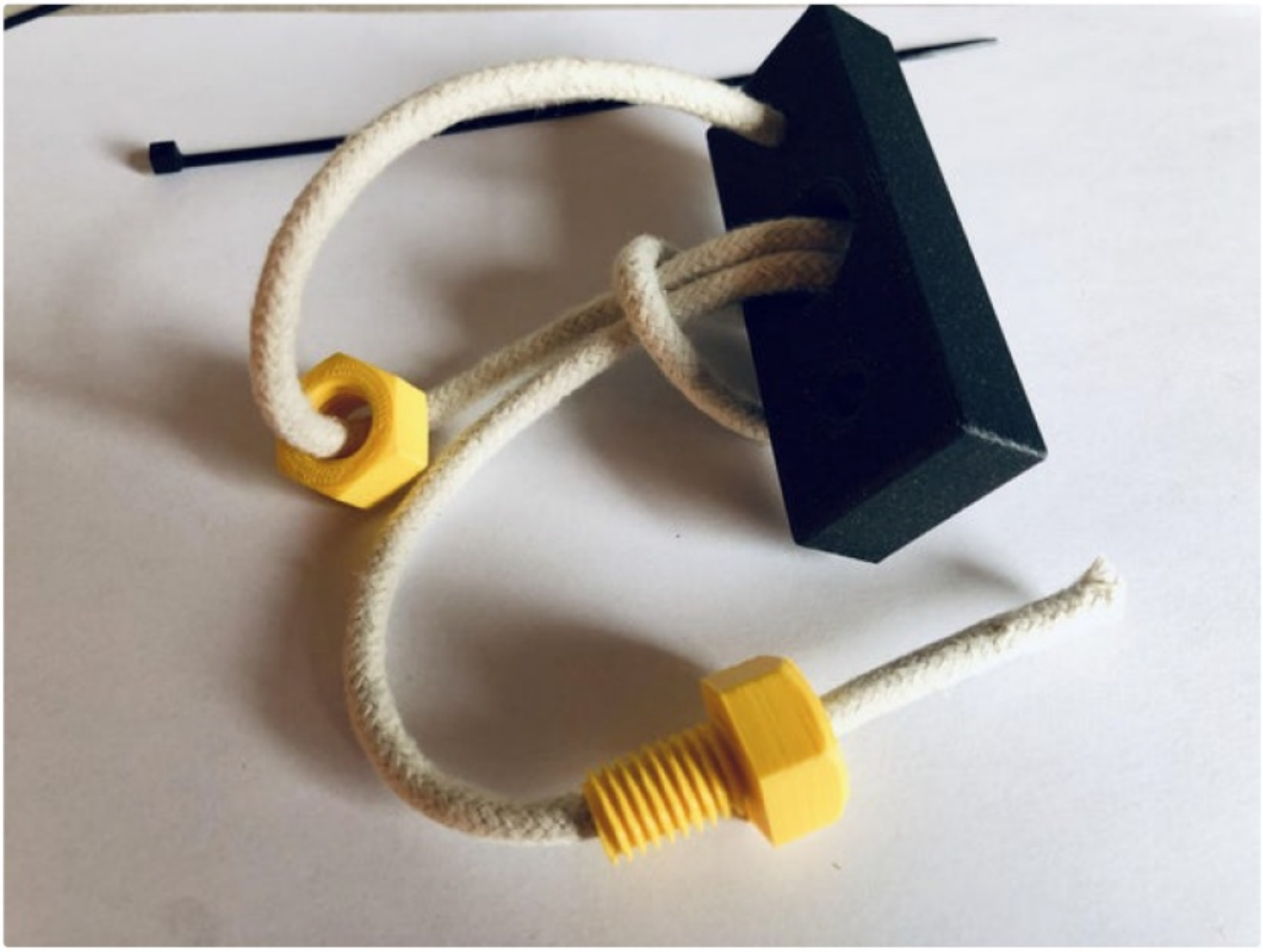


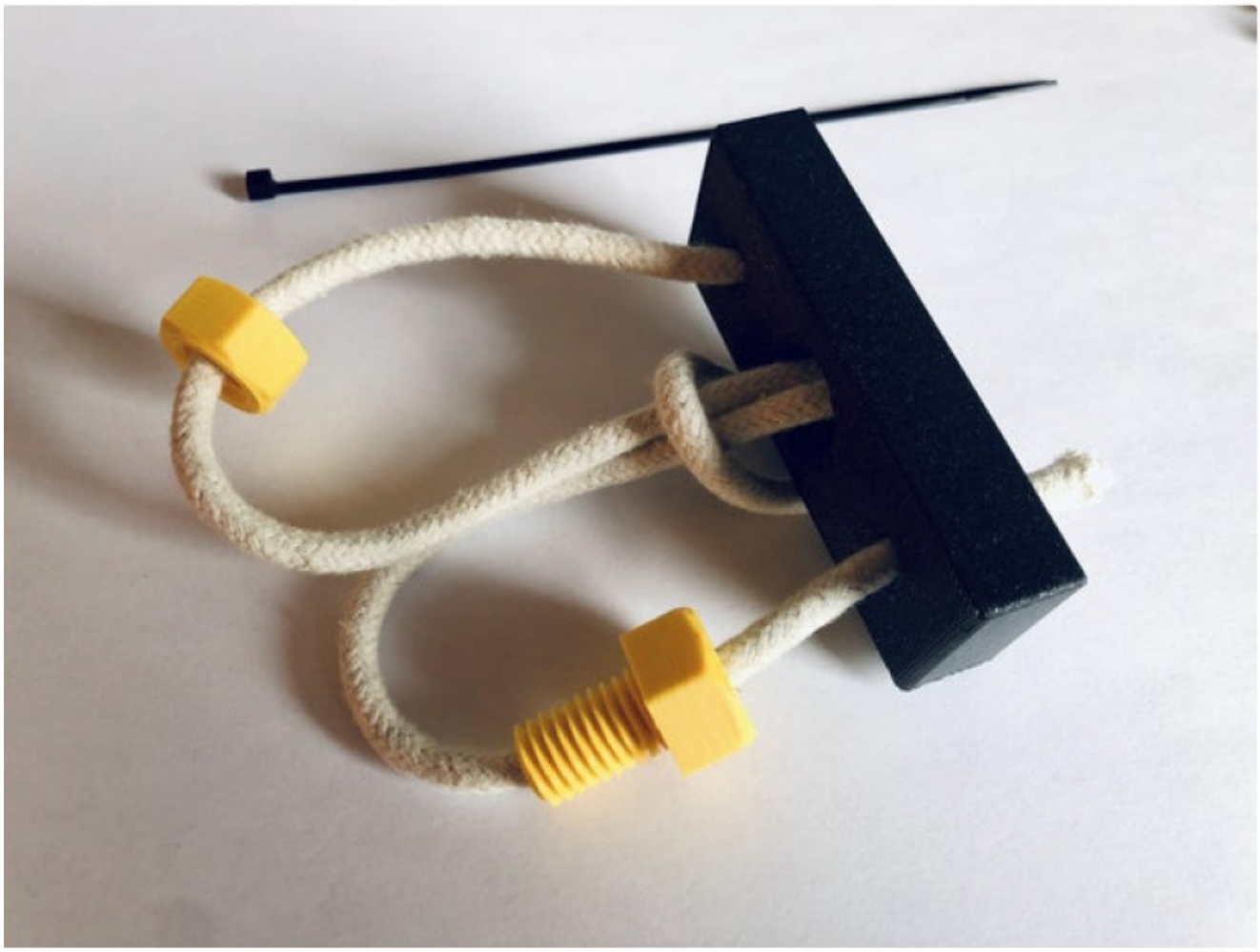


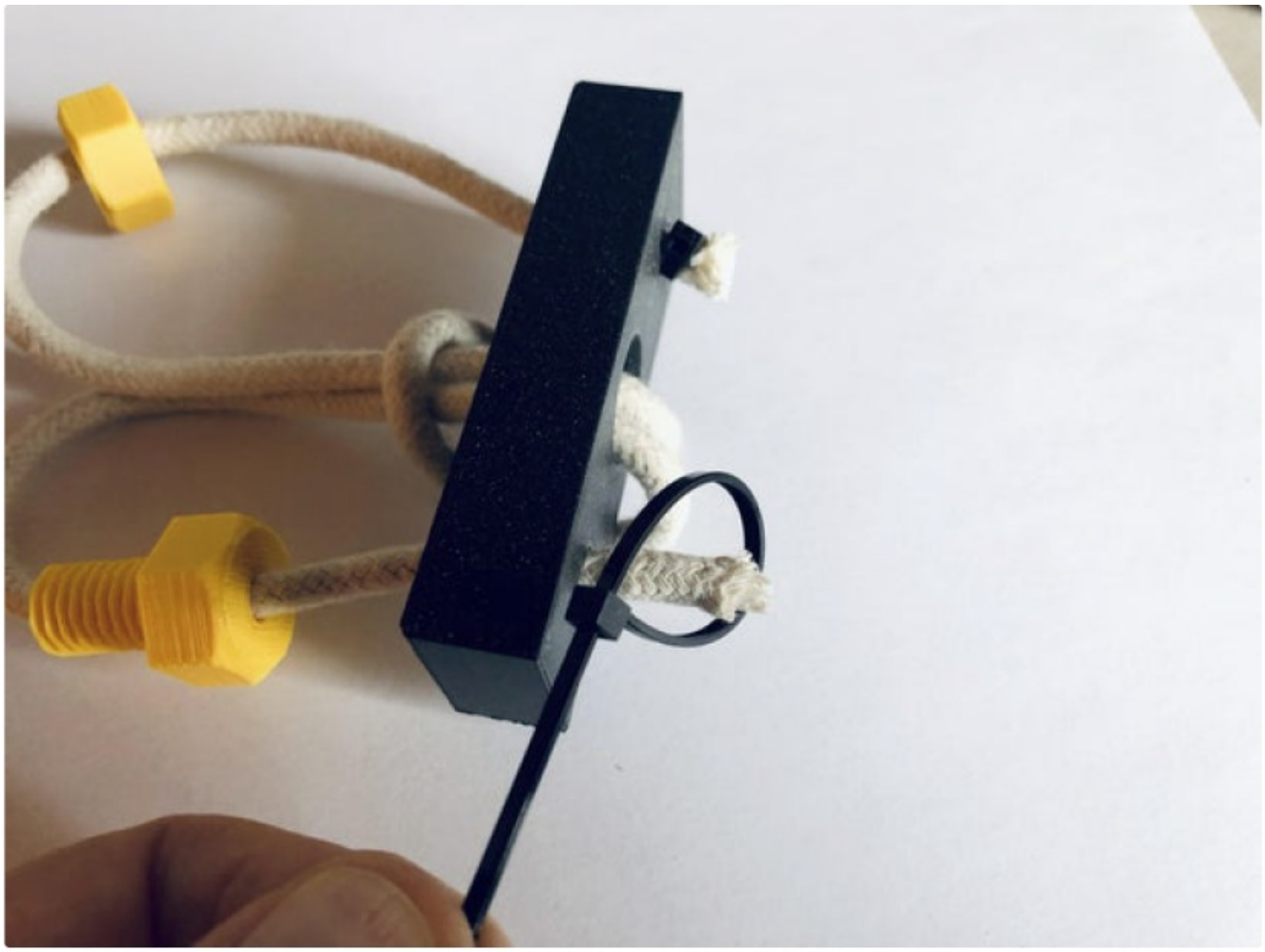


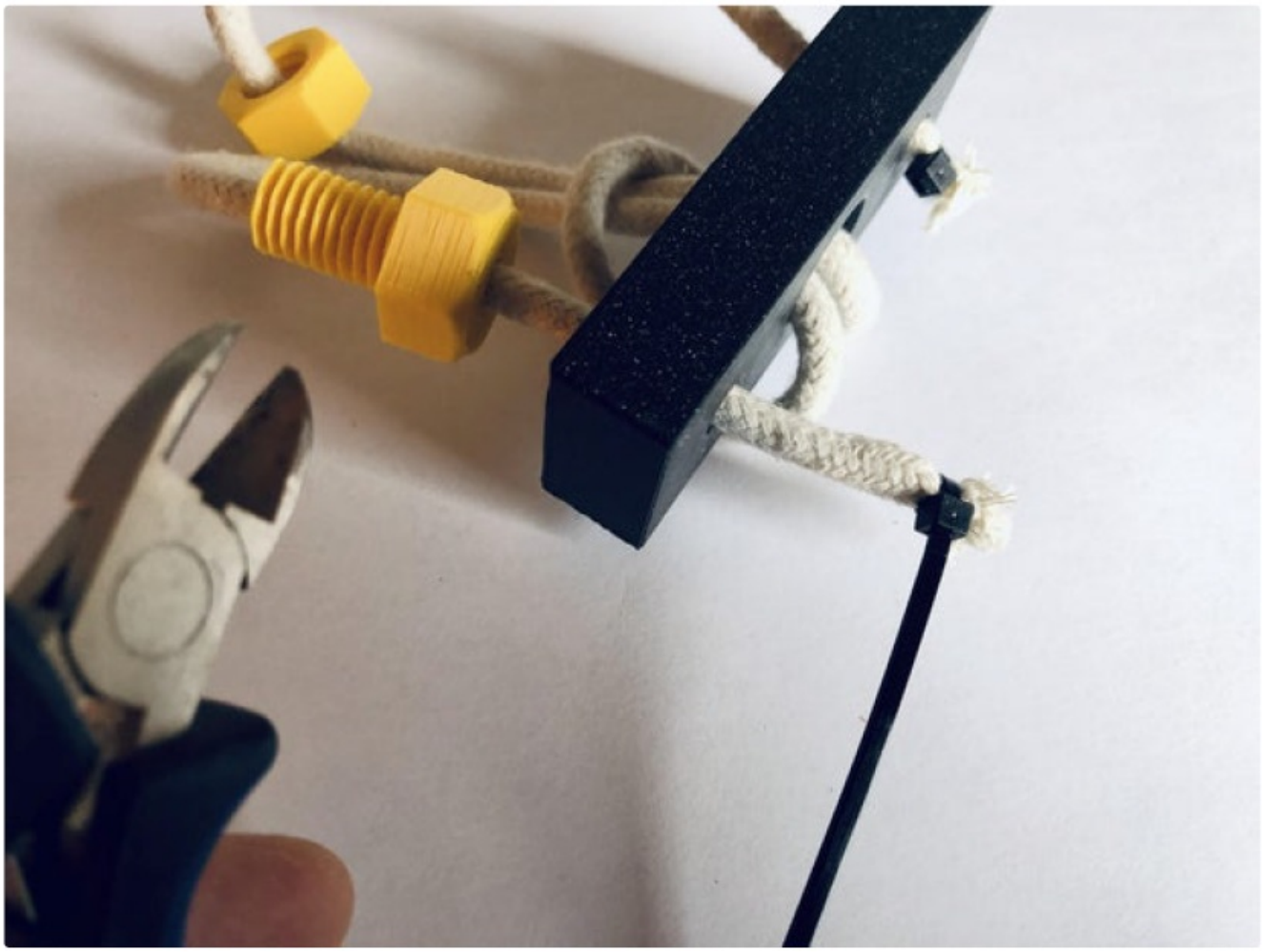


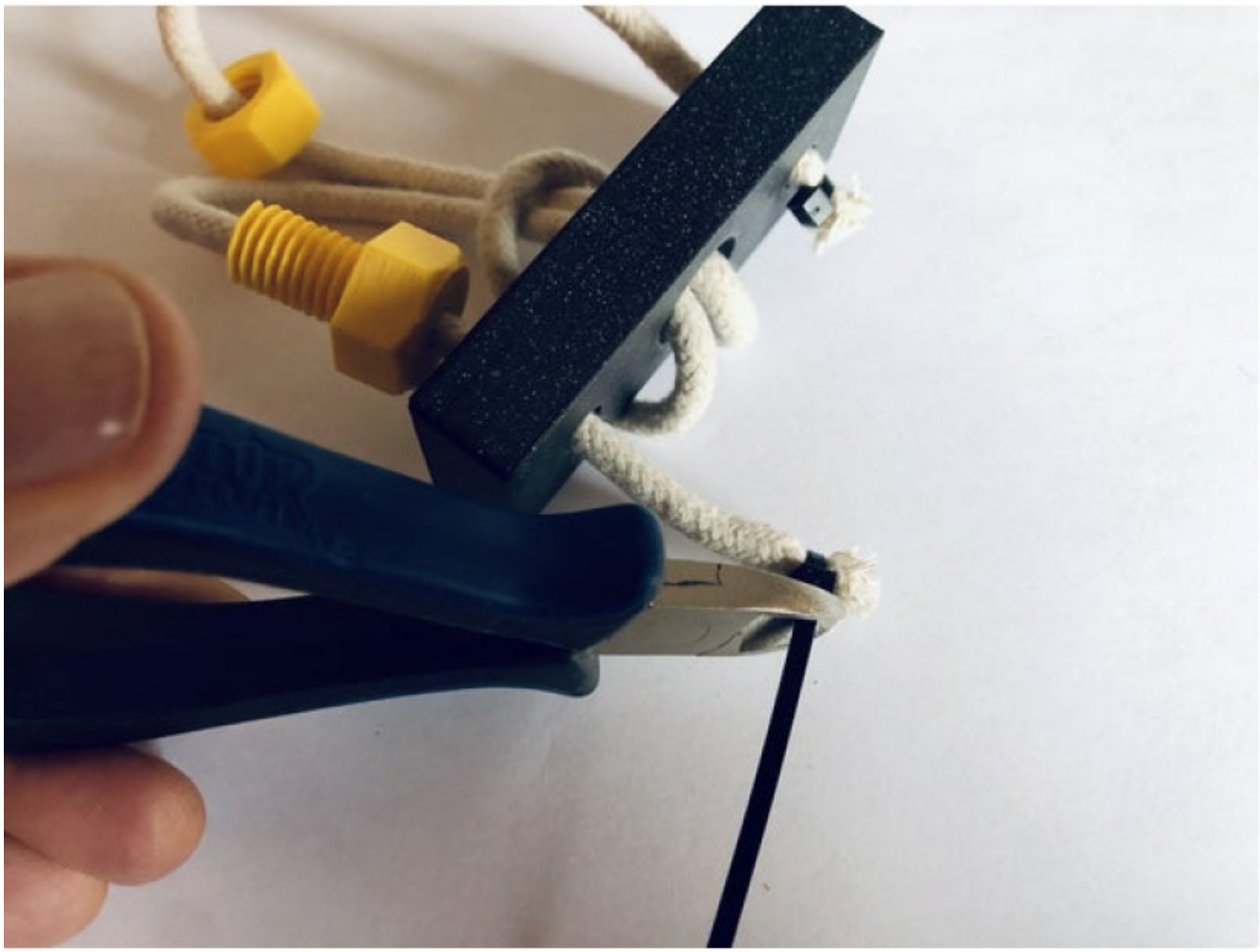


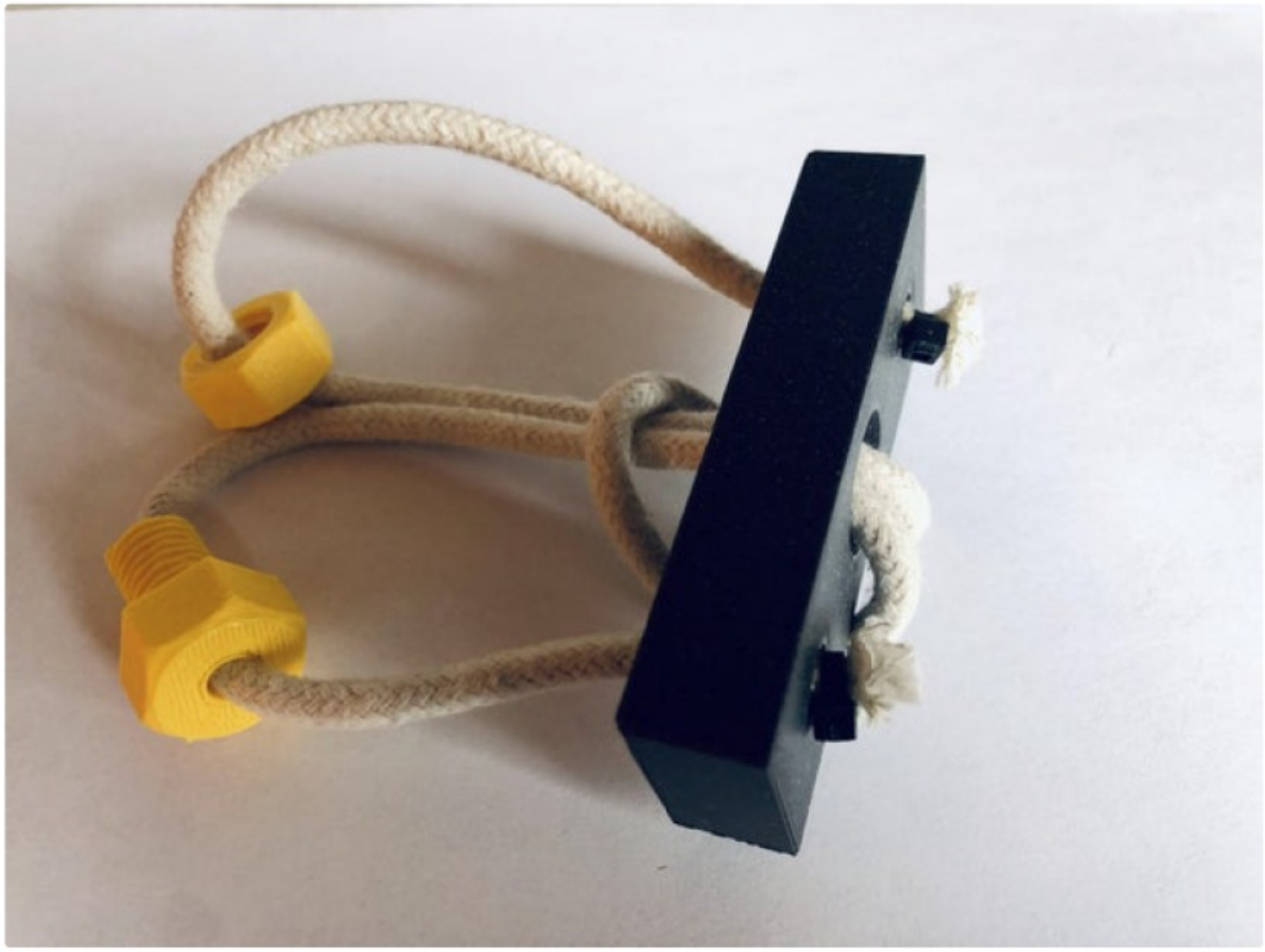












Solution

As for the solution of the puzzle, I would like to refer you to the page of AtulV15.
https://www.instructables.com/Twin-Nut-Puzzle/

He has described it very well. I have nothing to add to it! However, I still have to give one hint: for the solution you should only move the nut, because, due to the size of the screw, the solution process would be more diffcult.

- Cool little project! Instead of using zip ties I just made a knot, and used fabric glue to secure it, because the rope can't be melted.

- Looks good! The glued knots is a good idea!
- Nice job!
- Thank you!
- An excellent variation on an age old puzzle. Thank you for sharing.
- Looks good! Thanks for the positive feedback!

Bolt-Nut Puzzle – 3D Printed: Page 24

Documents / Resources

	instructables Bolt Nut Puzzle 3D Printed [pdf] Instruction Manual Bolt Nut Puzzle 3D Printed, Bolt Nut Puzzle, Nut Puzzle, Puzzle

References

- Yours for the making - Instructables
- Bolt-Nut Puzzle - 3D Printed : 3 Steps (with Pictures) - Instructables
- Seabirdhh's Profile - Instructables
- Twin Nut Puzzle : 8 Steps (with Pictures) - Instructables