Rat Rig

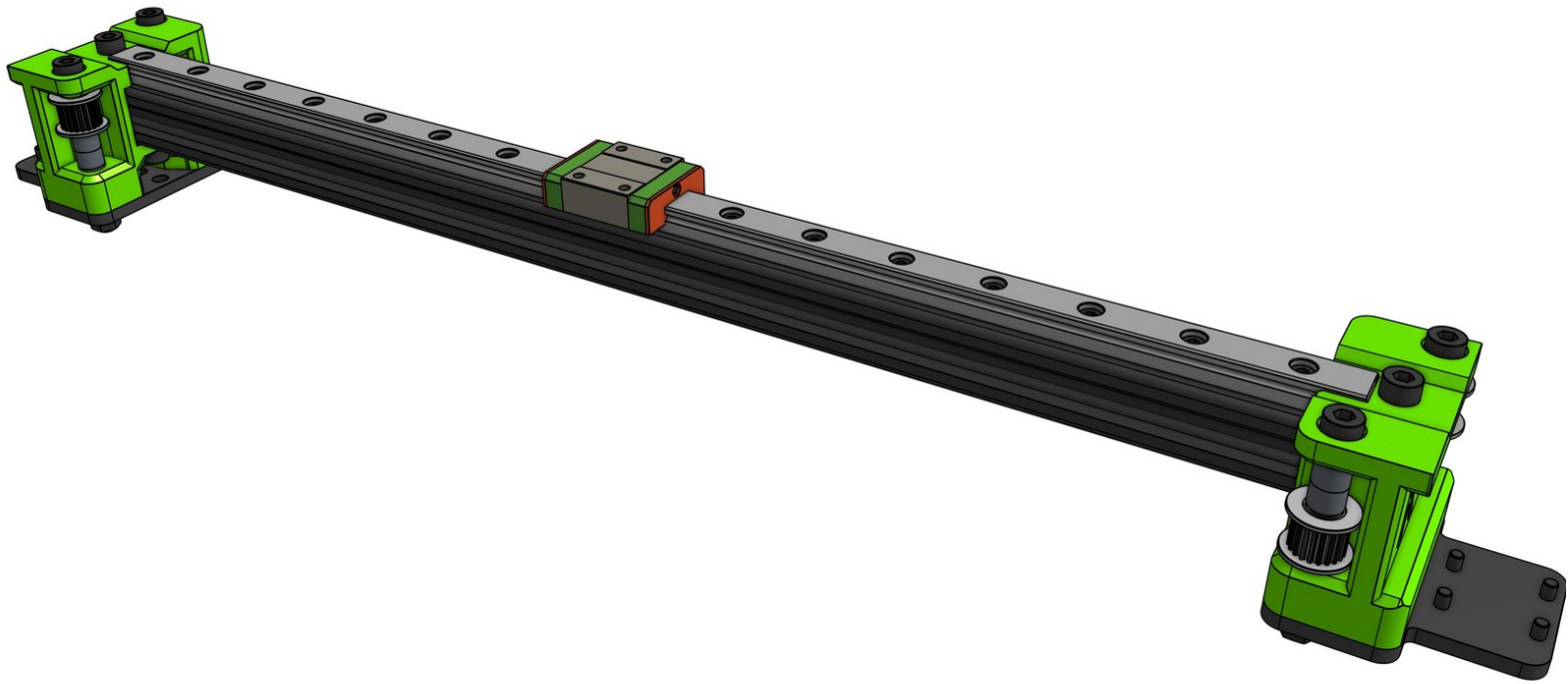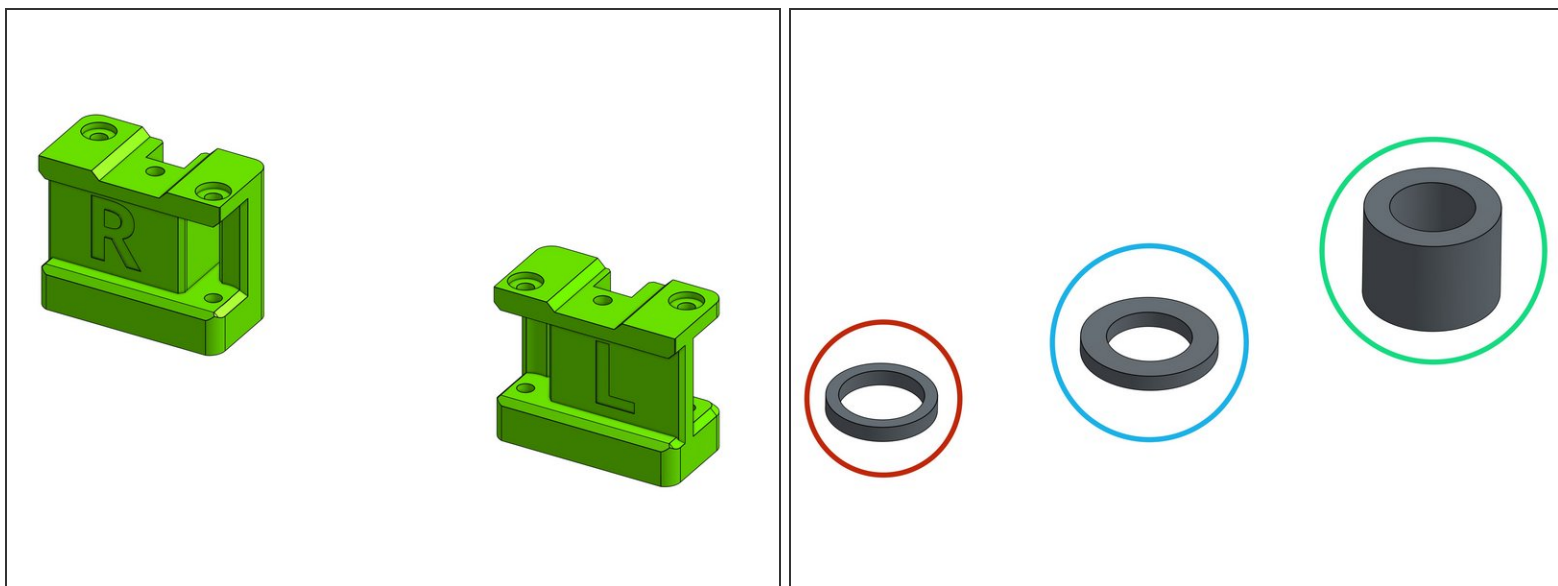## 06. X gantry

Written By: Paweł Kucmus

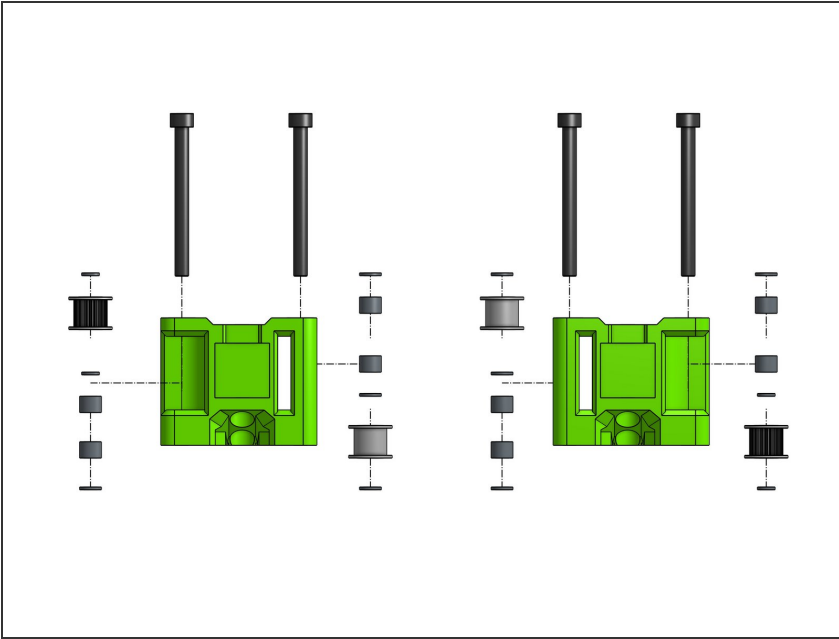## Step 1 — Identify the parts

- The focus of this guide is the X gantry which requires 2 printed parts which you can identify with the letters on the back:

  - **R** for right (looking from the front of the printer)

  - **L** for left

⚠ Take note of the difference between the shim types:
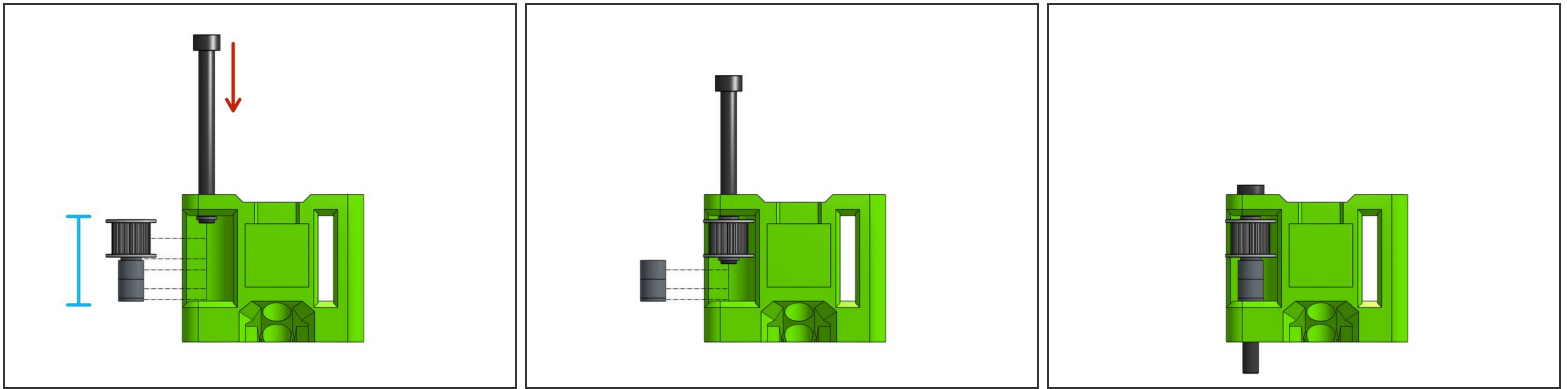
  - Micro

  - Mini

  - Spacer

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Step 2 — Threading the idler stacks

- ⓘ You will use the **micro** shims only on the top and bottom of the **toothed idlers**. All other shims are the **mini** shims.

- ⓘ The **toothed idlers** are on the front and the **smooth idlers** are on the back of the **XY Joiners**.

- ⓘ The left **XY Joiner** has its **toothed idler** on top of the stack and the **smooth** one in the bottom.

- ⓘ It's the other way around for the right **XY joiner** - **toothed idler** in the bottom and the **smooth** one on top of the stack.

- ⚠ The tolerances on the **XY Joiner** parts are minimal and that's by design.

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Step 3 — Left XY Joiner / Front

- Insert the left toothed stack on the **Cap Head Screw M5 x 55**

- Step by step insert the screw while adding the stack parts onto it: **micro shim**, **toothed idler**, **micro shim**, 2x **6mm spacers**, **mini shim**
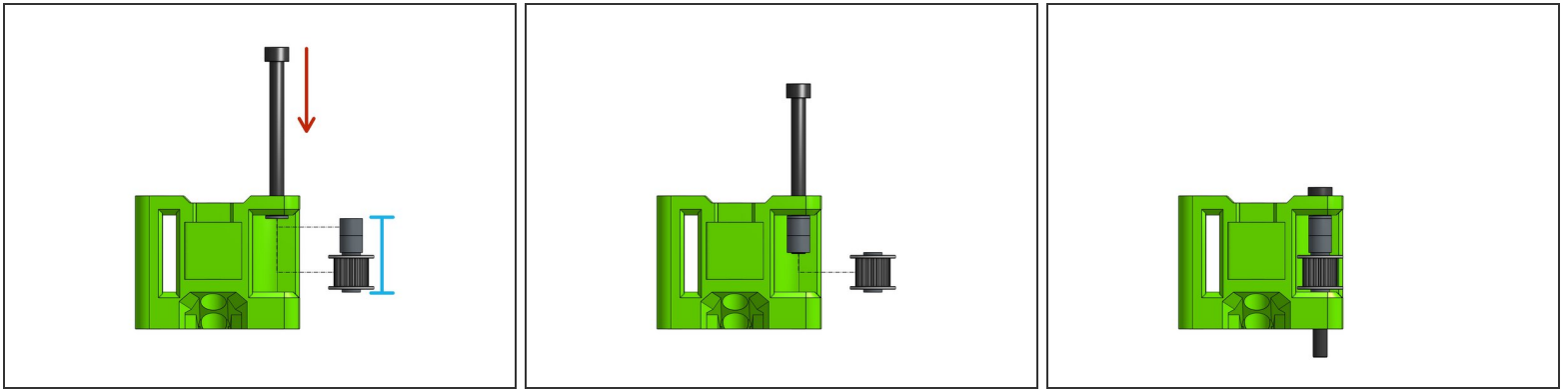
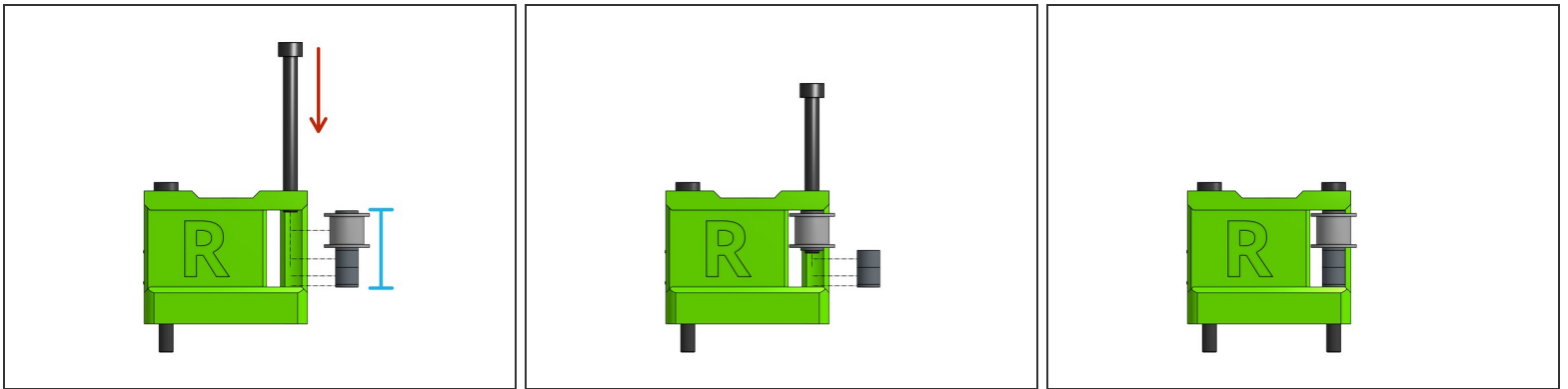## Step 4 — Left XY Joiner / Back
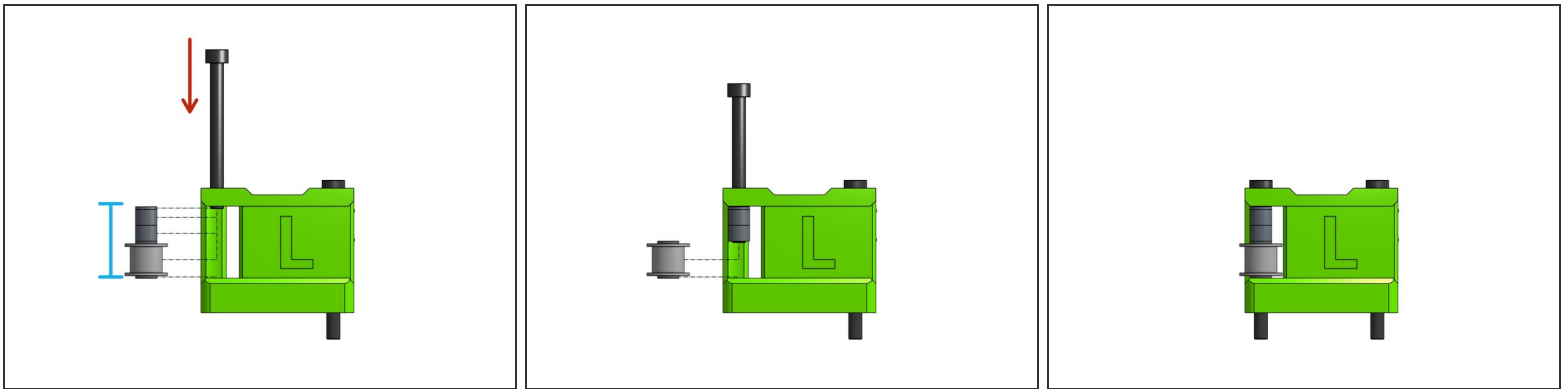
- Insert the left smooth stack on the **Cap Head Screw M5 x 55**

- Step by step insert the screw while adding the stack parts onto it: **mini shim**, 2x **6mm spacers**, **mini shim**, **smooth idler**, **mini shim**

Step 5 — Right XY Joiner / Front

- Insert the right toothed stack on the **Cap Head Screw M5 x 55**

- Step by step insert the screw while adding the stack parts onto it: **mini shim**, 2x **6mm spacers**, **micro shim**, **toothed idler**, **micro shim**
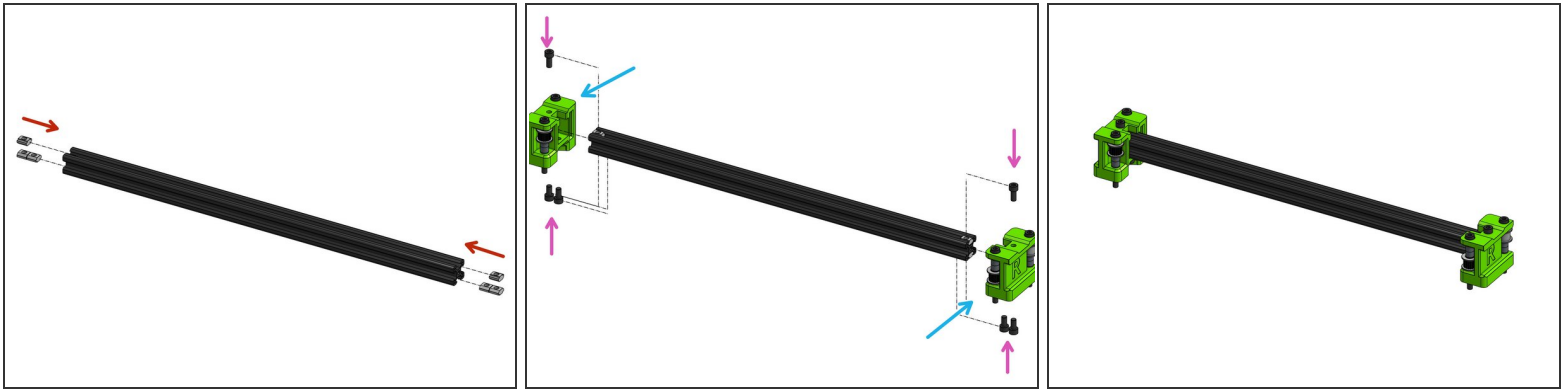
Step 6 — Right XY Joiner / Back

- Insert the right smooth stack on the **Cap Head Screw M5 x 55**

- Step by step insert the screw while adding the stack parts onto it: **mini shim**, **smooth idler**, **mini shim**, 2x **6mm spacers**, **mini shim**

## Step 7 — Attach the XY Joiners to the 2020 extrusion

- Slide the **square nuts** into the 2020 extrusion: 4 in the bottom slot and 2 in the top.

- Slide the **XY joiners** on the 2020 exrusion

⚠ Watch out not to pinch your fingers!

- Fasten everything together with 4x **Cap Head Screws M5x10** from the bottom and 2x **Cap Head Screws M5 12** from the top, those bolts need to firmly grab the **square nuts** that are in the profile
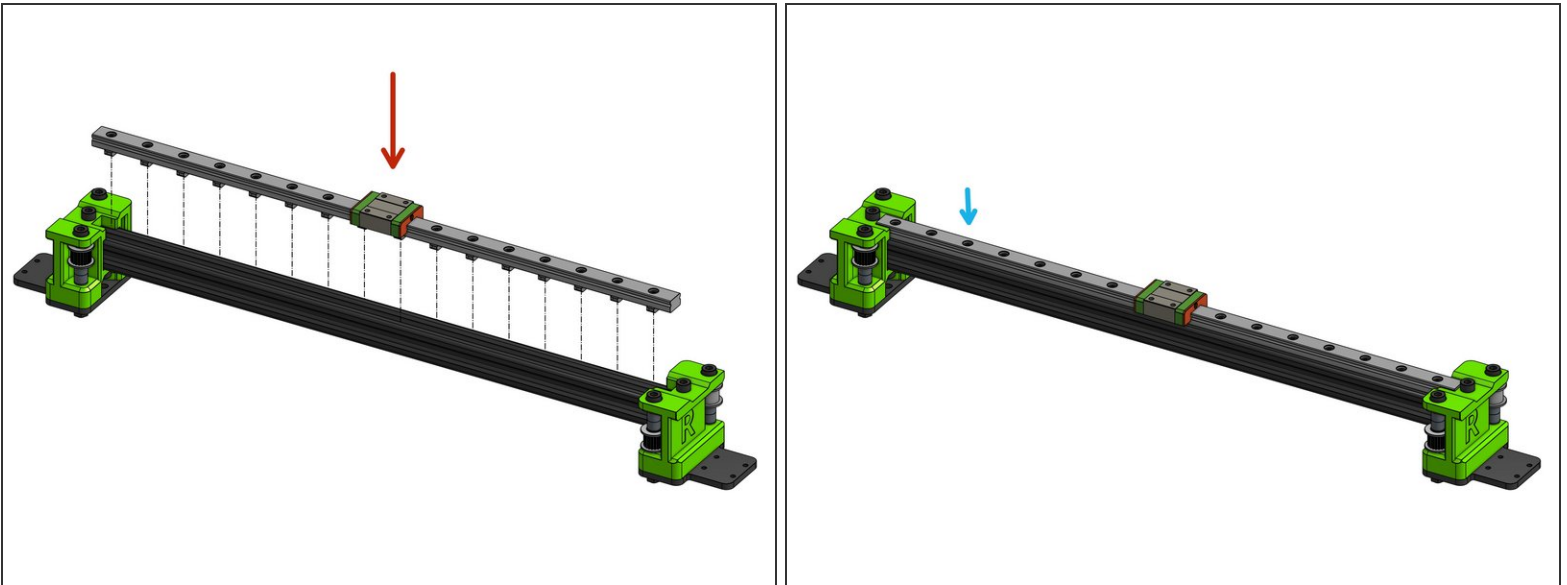
Step 8 — Attach the XY plates
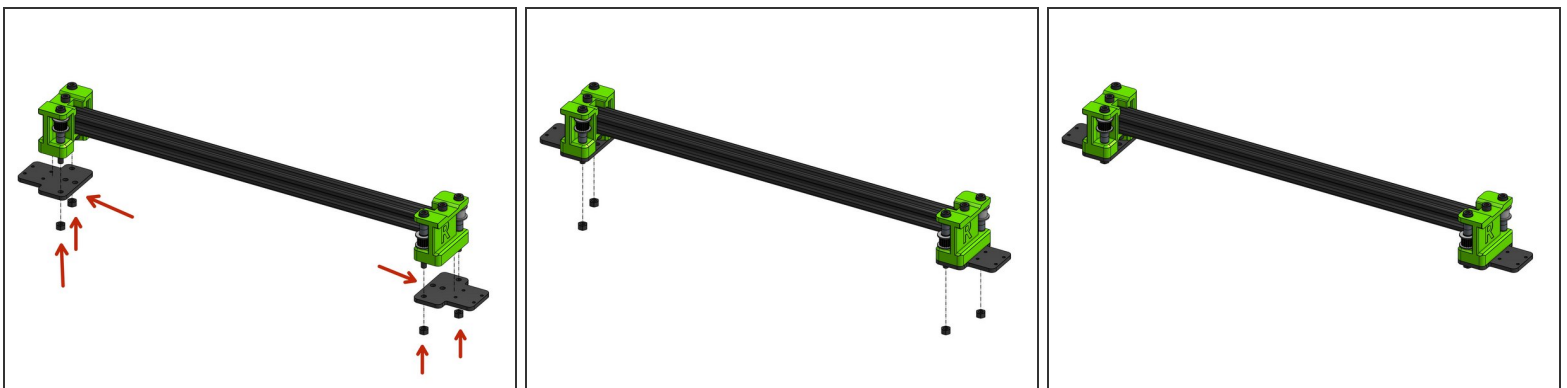
- Slide the two **XY plates** on the M5 screws and bolt them down with **M5 nuts**

⚠ Do not over tighten or you will be compressing the bearings.

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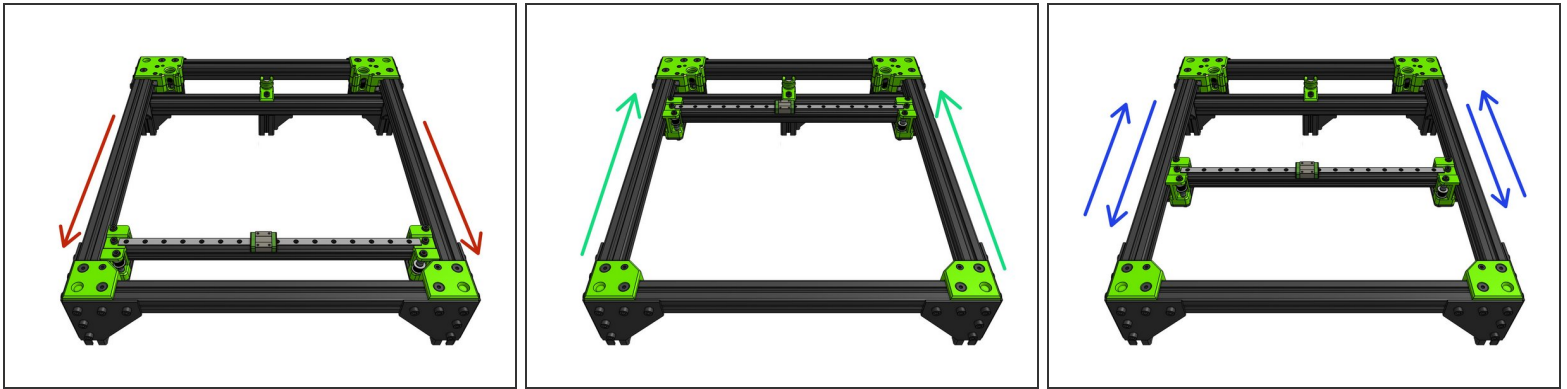
Step 9 — Attach the rail to the X gantry

- Attach the prepared MGN rail to the **2020 extrusion**

- Before Make sure to fasten **all** cap head screws

  ⚠ Please refer to the <u>linear rail installation guide</u> for instructions on the correct order to fasten the cap head screws

Step 10 — Attach the X gantry to the frame
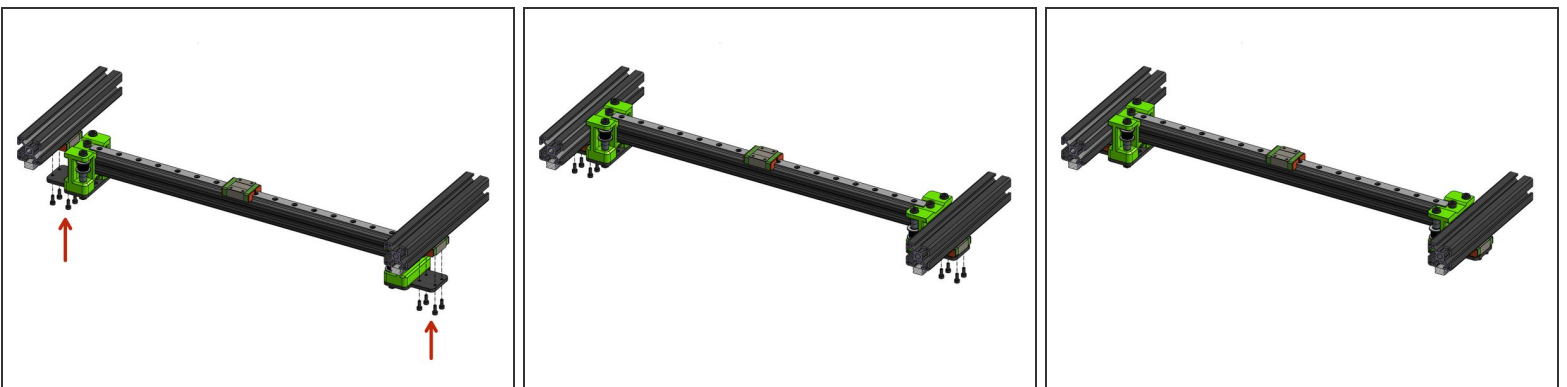
- ⓘ You may need to loosen the Y MGN rails for the rail to fit

- Attach the X gantry to the frame with 8x **Cap Head Screws M3x8**. **Do not tighten those fully yet.**

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Step 11 — Ensure the rails are parallel

ⓘ This step assumed you left the Y MGN rails screws loose

⚠ Please refer to the [linear rail installation guide](#) for instructions on the correct order to fasten the cap head screws in the following steps

- Move the X gantry to the front of the frame and back to uncover the first hole in the rail

- Fully fasten in the first Y MGN screws locking their position in the X dimension of the printer while at *Ymin*

- Move the gantry to the back and fully fasten the last screws of the Y MGN rails locking the rails position in the "X of the printer" at *Ymax*

- Lock the 8x screws holding the X gantry to it's MGN carriages

- Move the X gantry back and forward a few times to ensure there are no spots where the gantry moves less freely. If the gantry gets caught somewhere loosen the MGN rails and repeat the process

- Fully fasten all of the Y MGN screws and check again if the gantry is not binding
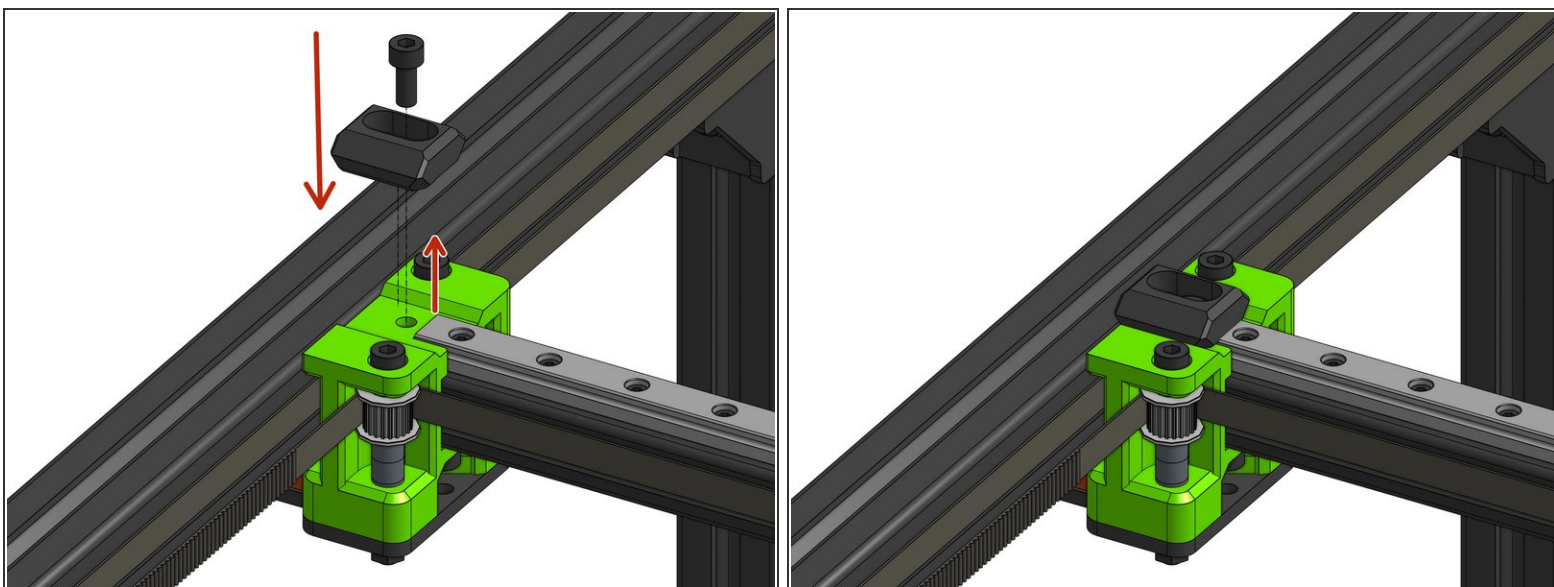
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Step 12 — Complete the belt runs

● Fold the belts through the XY joiners so that all 4 ends end up in the middle of the X gantry.
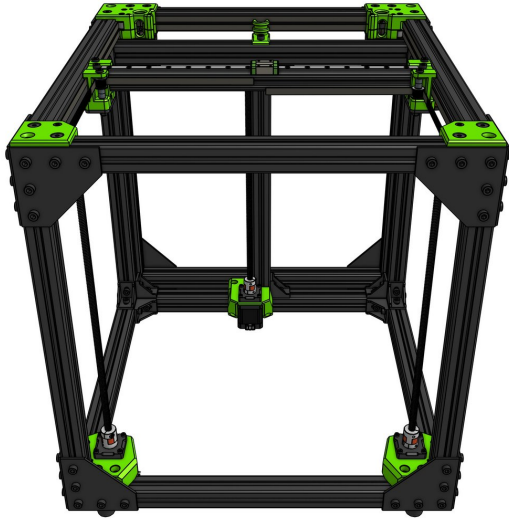
⚠ Don't try to cut the belts to length yet!

Step 13 — X endstop block

● Loosen the **Cap Head Screw M5x12** and fasten it back through the X endstop block part

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Step 14 — The EVA Carriage

(i) This guide does not include the assembly of an EVA carriage - your chosen EVA variant can be assembled last

Step 15 — Next guide...

- [07. Bed Assembly](#)

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