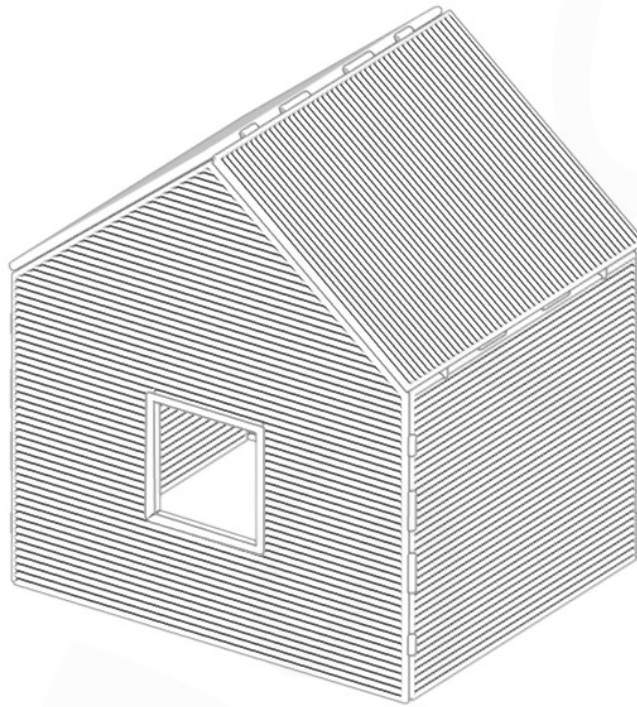


MAKE • DISCOVER • COLLECT

First 3D House

Ages 10 and up, including teenagers and adults; adult assistance during hot assembly. • About 55–85 minutes; you can divide the work across sessions.



Flat, filled PLA panels become a colorful little house: four walls, an open window, and two roof panels. A recreational activity for home or a workshop, with help positioning and tacking the parts.



Your outcome

Assemble a recognizable model from a few simple flat parts.

Construction illustration. The instructions show the successive stages. Full-size (1:1) templates are supplied on a separate sheet.

What you need

A 3D pen, the selected filament and equipment available in your workspace. See the complete list below.

Workstation

☐	3D pen compatible with 1.75 mm PLA	1 item
☐	Transparent mat for a 3D pen with a usable area of at least 20 × 26 cm	1 item
☐	Printed panel templates 1:1	1 set
☐	Flat, stable worktop	1 workstation
☐	Standard ruler with millimetre markings	1 piece
☐	Paper scissors	1 piece

Filament — amounts include extra

☐	PLA 1.75 mm — yellow — walls and corner seams	11.9 m · ≈ 35.8 g
☐	PLA 1.75 mm — brick red — roof panels and roof seams	4.5 m · ≈ 13.5 g
☐	PLA 1.75 mm — turquoise — window frame	0.1 m · ≈ 0.3 g

Total filament: 16.5 m · approximately 49.6 g

The quantities include extra filament. Grams indicate estimated net filament mass, excluding packaging.

Before you start

Assembly assistance

While positioning the walls and roof, the helper uses both hands on cool parts, and the participant operates the pen. Follow the pen manufacturer's instructions and age requirements.

Your own colors

Yellow denotes the walls, brick red the roof, and turquoise the window edge. Choose your own three colors and use them in the same places. Preparation quantities come exclusively from the table calculated by the package producer.

- 1 Place the mat securely, flat and completely on the worktop, away from the edge of the table.
- 2 Print both pages of the templates at 100% scale. Measure the reference segment with a ruler: it must be 20 mm long. Cut out six separate rectangles containing the templates, leaving about 5 mm of paper outside each outline; do not cut along the model line. Keep or add the W01–W06 labels on the cutouts.
- 3 Before you start drawing, arrange all the templates beneath a single mat in two columns and three rows: W01 and W03 at the top (front and back), W02 and W04 in the middle (sides), and W05 and W06 at the bottom (roof panels, with the longer edge horizontal). Leave at least 5 mm between the paper rectangles.

The complete layout fits within the 20 × 26 cm usable area. Place the mat over the complete layout; all outlines must be separate and visible. Do not move the templates or the mat during steps 1–2.

- 4 Arrange for help during assembly. Prepare the colors for the walls, roof, and window edge.
- 5 Do not touch the hot nozzle or freshly extruded strands. Leave the outlines on the mat for filling and cooling; move only the finished panels once they are cool.

Designer's estimate, not a measured completion time. Pen work takes about 35–55 minutes; cooling and fitting may extend the activity. Take a break after the panels or after the walls. No time limit.

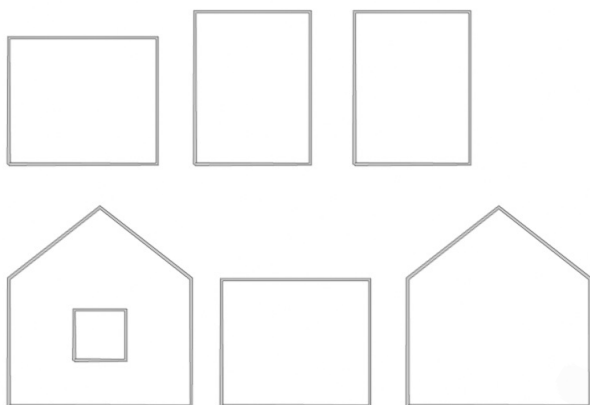


How to read the instructions

The large image shows the completed stage. Small views show the action and current parts. ×N means repeat the whole action N times, cooling and checking each time. Illustrations are not at 1:1 scale.

STAGE 01 / 08 • Session dom

Six outlines



Six outlines

NOW Front wall with window · Left side wall · Rear wall with gable · Right side wall · Left roof panel · Right roof panel

Blue / dark emphasis: the part used in this action. Arrows: visual guides. Illustration not to scale.

PARTS FOR THIS STAGE

1 × Front wall with window · PLA | template follow the written method

1 × Left side wall; 1 × Rear wall with gable; 1 × Right side wall; 1 × Left roof panel; 1 × Right roof panel · PLA | template follow the written method

→ T001, T002 • Techniques — reference appendix

Choose the colors for the walls, roof, and window frame. On the six templates arranged together beneath the mat, make only four wall outlines and two roof-panel outlines; also trace the window in the front wall. Leave all the outlines on the mat, unfilled. You will fill them in step 2.



Check

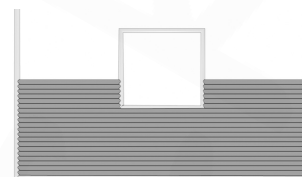
There are six unfilled outlines on the pad: four walls and two identical roof panels. The center of the window is empty.

If it does not work

After cooling, fill the gap in the outline with a short strand.

STAGE 02 / 08 • Session dom

Colored edge and cooling



Strands touch the outline



Six filled panels

Stage outcome

NOW Front wall with window · Left side wall · Rear wall with gable · Right side wall · Left roof panel · Right roof panel · Colored window edge

Blue / dark emphasis: the part used in this action. Arrows: visual guides. Illustration not to scale.

PARTS FOR THIS STAGE

1 × Front wall with window · PLA | template follow the written method

1 × Left side wall; 1 × Rear wall with gable; 1 × Right side wall; 1 × Left roof panel; 1 × Right roof panel · PLA | template follow the written method

1 × Colored window edge · PLA | template follow the written method

→ T001, T002, T003 • Techniques — reference appendix

On the pad, fill the six outlines, starting with the wall that has the window. Connect adjacent strands to the outline; at the window, end them at the frame. Keep the layer flat and choose your own color scheme for the walls and roof.

On the cool front wall lying flat, add a thin second layer of color along the edge of the window; leave the opening empty. Leave the outlines on the pad until they have been filled and cooled. Once the frame has cooled, you may move the finished panels for assembly.



Check

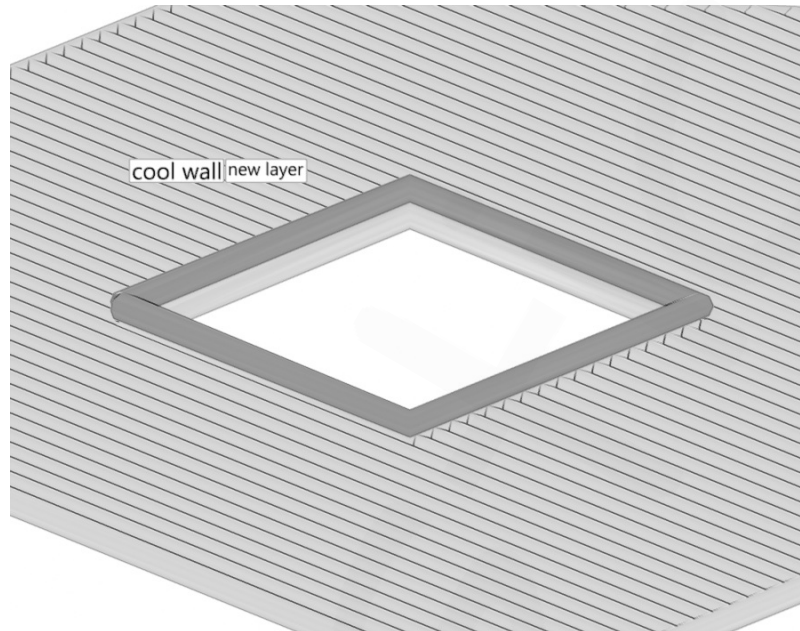
You have six cool, filled panels. The frame is bonded to the wall; the window opening is empty.

If it does not work

Fill only the missing section of the frame; do not add a thick mass.

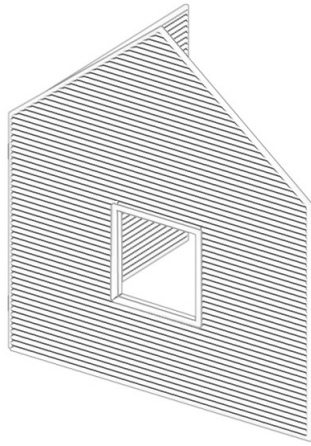
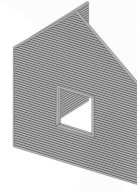
Colored edge and cooling — construction details

Colored edge — second layer



STAGE 03 / 08 • Session dom

Position and tack the first corner



The helper's two hands hold the cool walls



New tack

Stage outcome

NOW Front wall with window · Left side wall · Colored window edge · Rear wall with gable · Right side wall · Left roof panel · Right roof panel · Corner tack fl

Blue / dark emphasis: the part used in this action. Arrows: visual guides. Illustration not to scale.

PARTS FOR THIS STAGE

1 × Corner tack fl · PLA | template follow the written method

→ T004 • Techniques — reference appendix

Stand the front and left walls on their lower edges on the flat worktop. The side wall meets the inside of the front wall, flush with its left edge. The helper holds one cool wall in each hand, away from the corner. The remaining panels wait nearby.

While the helper supports both walls, add two short tacks to the outside joint: one near the bottom and the other near the top of the straight side. Cool each one before releasing the grip.

✓ Check

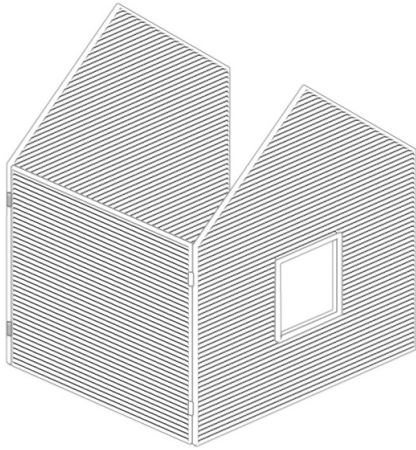
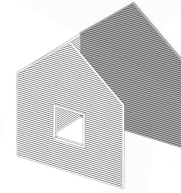
The corner maintains its angle; the lower edges still stand flat.

If it does not work

If the assembly spreads apart, the helper repositions the cool parts; complete the tack and let it cool.

STAGE 04 / 08 • Session dom

Position and tack the rear wall



Support for the cool assembly and rear wall



New rear tack

Stage outcome

NOW Rear wall with gable · Corner tack bl

Blue / dark emphasis: the part used in this action. Arrows: visual guides. Illustration not to scale.

PARTS FOR THIS STAGE

1 × Corner tack bl · PLA | template follow the written method

→ T004 • Techniques — reference appendix

Stand the rear wall on the worktop and move it against the end of the left side. The left side fits between the front and rear walls. With one hand, the helper steadies the cool corner; with the other, they hold the rear wall at its center. The helper supports the cool assembly and the rear wall.

Add two tacks to the outside rear corner as before. Hold until cool.



Check

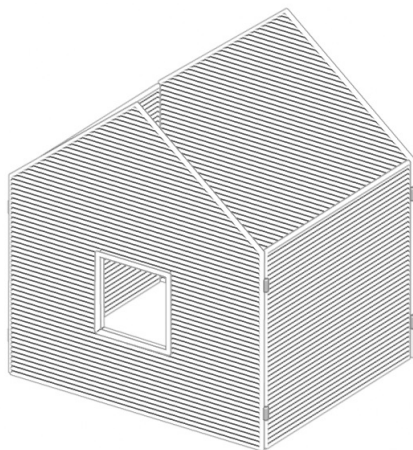
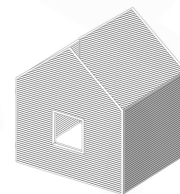
This creates a rigid U-shaped assembly of three walls.

If it does not work

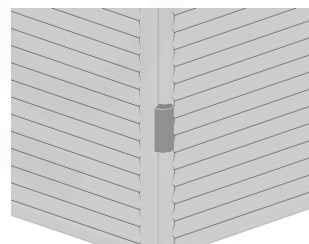
Before adding the next wall, correct the alignment or complete an inconsistent tack.

STAGE 05 / 08 • Session dom

Close and tack the four walls



Check both ends before welding



Front tack

Stage outcome

NOW Right side wall · Corner tack fr · Corner tack br

Blue / dark emphasis: the part used in this action. Arrows: visual guides. Illustration not to scale.

PARTS FOR THIS STAGE

1 × Corner tack fr; 1 × Corner tack br · PLA | template follow the written method

→ T004 • Techniques — reference appendix

Insert the right wall between the front and rear walls. The helper holds the cool U-shaped assembly and the added side. Check the fit at both ends and make sure all lower edges are flat before adding material. Add two short tacks to each corner of the right side while supporting the cool walls.

Once they have cooled, release the grip slightly and check the alignment.



Check

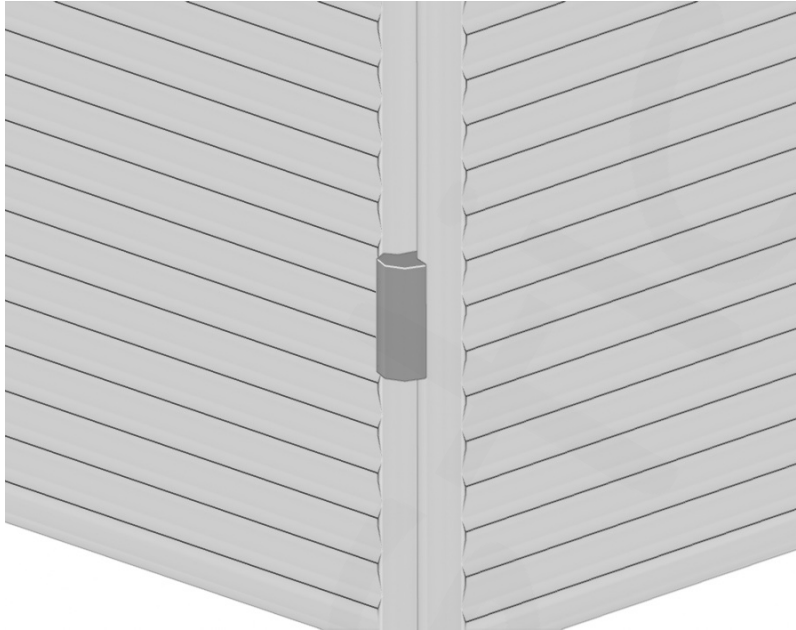
The structure stands on its four lower edges and does not spread apart.

If it does not work

Do not make a long seam yet. Correct the tack or alignment first.

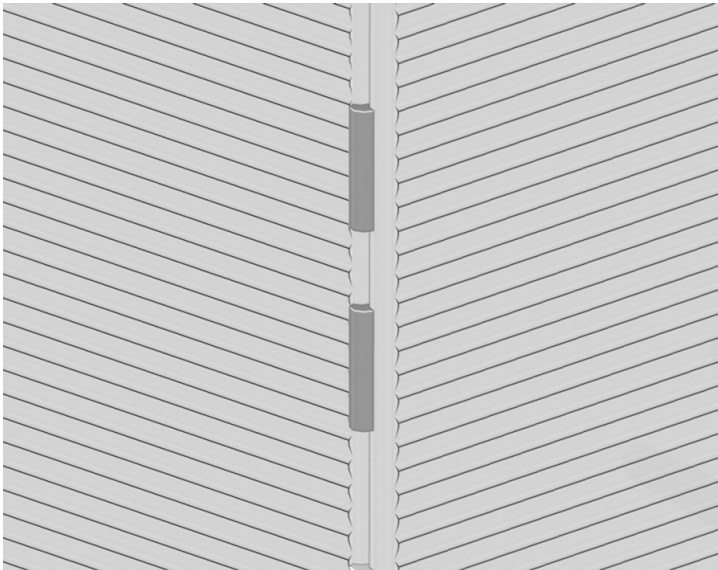
Close and tack the four walls — construction details

Rear tack



STAGE 06 / 08 • Session dom

Reinforce the checked corners



New sections between the tacks

NOW Short corner reinforcements fl · Short corner reinforcements bl · Short corner reinforcements fr · Short corner reinforcements br

Blue / dark emphasis: the part used in this action. Arrows: visual guides. Illustration not to scale.

PARTS FOR THIS STAGE

1 × Short corner reinforcements fl; 1 × Short corner reinforcements bl; 1 × Short corner reinforcements fr; 1 × Short corner reinforcements br · PLA | template follow the written method

→ T004 • Techniques — reference appendix

Only when the four walls are positioned correctly, add two short seam sections between the tacks at each outside corner. Cool each section before moving to the next. The helper steadies the cool opposite side; rotate only the cool assembly so that each joint is accessible from the outside.



Check

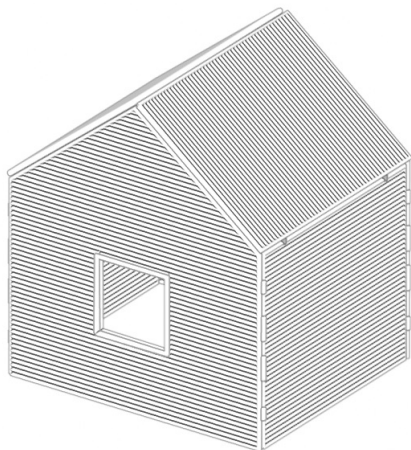
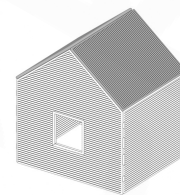
Each of the four corners has tacks and two short reinforcements. The structure stands unsupported.

If it does not work

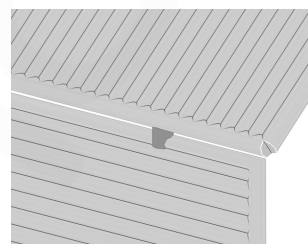
Cool and fill only the interrupted joint. Do not flood the entire corner.

STAGE 07 / 08 • Session dom

Tack the roof on both sides



Each roof panel has separate support



New left-eave tack

Stage outcome

NOW Left roof panel · Right roof panel · Eave tacks left · Eave tacks right

Blue / dark emphasis: the part used in this action. Arrows: visual guides. Illustration not to scale.

PARTS FOR THIS STAGE

1 × Eave tacks left; 1 × Eave tacks right · PLA | template follow the written method

→ T004 • Techniques — reference appendix

Place both roof panels on the cool walls. The helper holds each one with a separate hand at its cool center. Align their front and rear edges with the gable walls; position their top edges opposite each other above the center of the house. Check their support on both gables.

You will join small gaps at the eaves and ridge with tacks; do not force the edges into place. The helper continues to hold both roof panels at their cool centers. At each eave, add one short tack near the front and one near the rear, from the side wall to the roof panel.

Alternate between the two sides; cool each tack before making the next one. Do not release the other roof panel while working on the first.

✓ Check

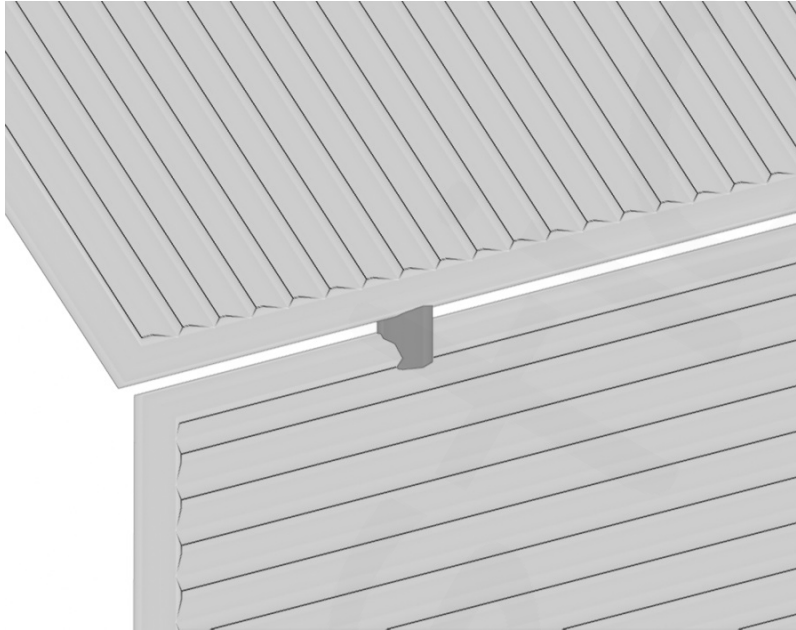
Both roof panels are tacked to their side walls. The ridge edges are still aligned.

If it does not work

If a roof panel has shifted, stop; correct the fit before reinforcing it.

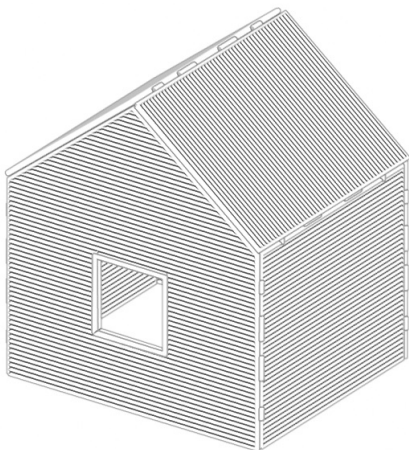
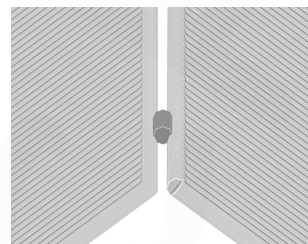
Tack the roof on both sides — construction details

New right-eave tack

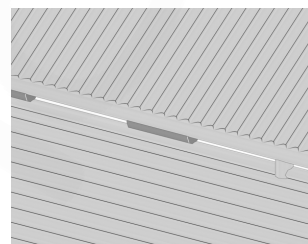


STAGE 08 / 08 • Session dom

Stand up your house



New ridge tack



Eave reinforcement

Stage outcome

NOW Ridge tacks · Eave reinforcement left · Eave reinforcement right · Ridge reinforcement

Blue / dark emphasis: the part used in this action. Arrows: visual guides. Illustration not to scale.

PARTS FOR THIS STAGE

1 × Ridge tacks; 1 × Eave reinforcement left; 1 × Eave reinforcement right; 1 × Ridge reinforcement · PLA | template follow the written method

→ T004 • Techniques — reference appendix

While supporting the cool centers of the roof panels, add two short ridge tacks: one near the front and one near the rear. Join both edges with a new strand and let it cool. After checking and cooling the tacks, add two short sections at each eave and two at the ridge. The helper steadies the house by the cool walls below the roof.

Work from the outside, one joint at a time, pausing to let it cool. Once it has cooled, place the house on a flat worktop and release your grip. View it from all four sides and through the window. Choose a place for your own colorful house.



Check

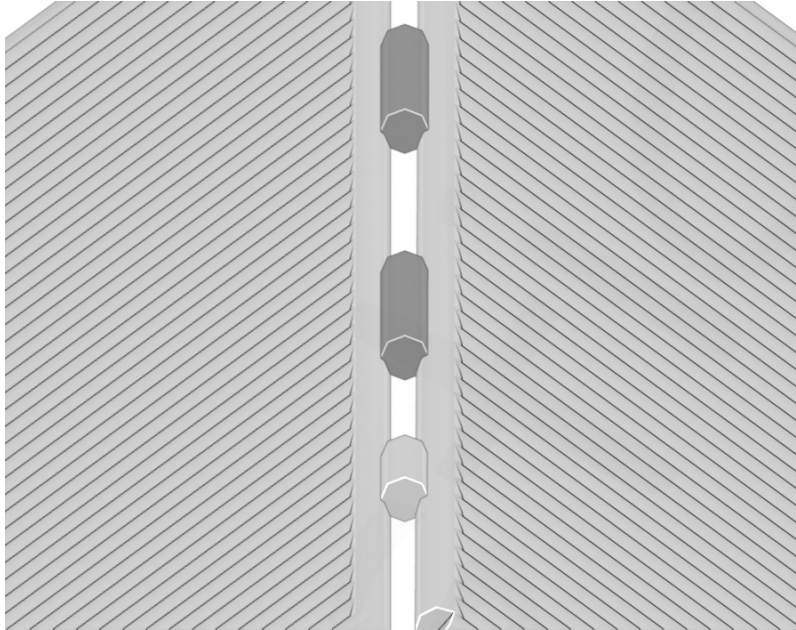
The house stands unsupported and does not rock; four walls surround an empty space, the window is open, and the roof is attached on both sides.

If it does not work

If the model rocks or the roof moves at a joint, set it aside and correct the appropriate cool part with an adult's help.

Stand up your house — construction details

Ridge reinforcement



Finished — check the outcome



Check

Four filled walls surround an empty interior.



Check

Two roof panels meet at the ridge and are attached to both side walls.



Check

The window opening remains clear.



Check

The house stands unsupported on a flat worktop and does not rock.



Check

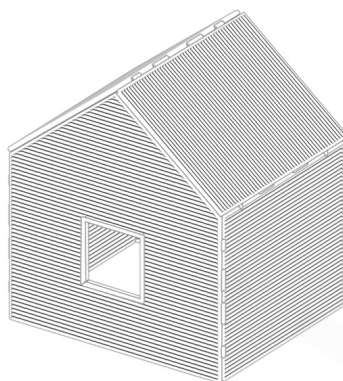
The participant chooses the colors of the walls, roof, and frame.

Storage

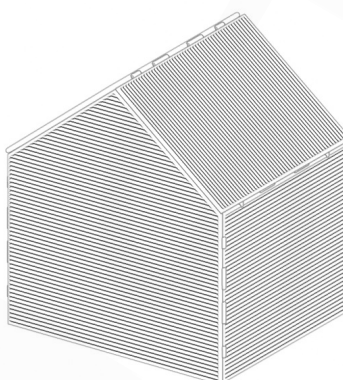
Store the model in a cool place away from sunlight and heat. Repair it on a suitable 3D-pen work surface using the same material as the part.

View from different sides

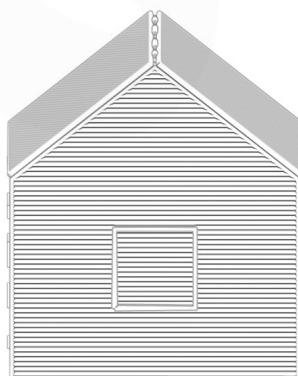
View 1



View 2



View 3



Techniques — reference appendix

T001 • Stage 1 • Stage 2

1 × Front wall with window · PLA | template follow the written method

Stage 1: make only a thin, continuous outline of the wall and window; leave it on the pad without filling it. Stage 2: fill the outline with parallel, touching strands; connect each one to the outline. At the window, end the strands at the frame; leave the 18 × 18 mm opening empty. Keep it as one flat layer approximately 1.4 mm thick.

Do not bend the PLA. Finished cross-section [mm]: 1.4 × 1.4. Support: Flat on the standard transparent mat, on the worktop. Strand direction: Stage 1: along the outline. Stage 2: alternating left–right, from edge to edge, with adjacent strands touching.

Cooling: Leave the outlines on the pad until they have been filled and cooled; only finished, cool panels may be moved.

T002 • Stage 1 • Stage 2

1 × Left side wall; 1 × Rear wall with gable; 1 × Right side wall; 1 × Left roof panel; 1 × Right roof panel · PLA | template follow the written method

Stage 1: make only a thin, continuous outline; leave it on the pad without filling it. Stage 2: fill the outline with parallel, touching strands; connect each one to the outline. Keep it as one flat layer approximately 1.4 mm thick. Do not bend the PLA. Finished cross-section [mm]: 1.4 × 1.4.

Support: Flat on the standard transparent mat, on the worktop. Strand direction: Stage 1: along the outline. Stage 2: alternating left–right, from edge to edge, with adjacent strands touching. Cooling: Leave the outlines on the pad until they have been filled and cooled; only finished, cool panels may be moved.

Techniques — reference appendix — continued

T003 • Stage 2

1 × Colored window edge · PLA | template follow the written method

Stage 2: on the cool, filled front wall lying flat on the pad, apply a thin second layer in your chosen color along the existing edge of the window. Leave the opening empty; allow the edge to cool before moving the panel. Finished cross-section [mm]: 1.4 × 1.4.

Support: One cool front wall lies flat on the pad; the new strand rests on the existing edge of the window. Strand direction: Guide the strand along all four sides of the existing frame, joining its ends; do not run strands across the opening. Cooling: Leave the panel flat on the pad until the new layer has cooled.

Tip access: Guide the nozzle over the frame from above; keep your hands out of its path.

T004 • Stage 3 · Stage 4 · Stage 5 · Stage 6 · Stage 7 · Stage 8

1 × Corner tack fl · PLA | template follow the written method

1 × Corner tack bl · PLA | template follow the written method

1 × Corner tack fr; 1 × Corner tack br · PLA | template follow the written method

1 × Short corner reinforcements fl; 1 × Short corner reinforcements bl; 1 × Short corner reinforcements fr; 1 × Short corner reinforcements br · PLA | template follow the written method

1 × Eave tacks left; 1 × Eave tacks right · PLA | template follow the written method

1 × Ridge tacks; 1 × Eave reinforcement left; 1 × Eave reinforcement right; 1 × Ridge reinforcement · PLA | template follow the written method

Add only the indicated short strands in the current step. First tack, cool, and check the alignment; only then reinforce the joint. Finished cross-section [mm]: 1.4 × 1.4. Support: The helper holds the indicated cool surfaces; the lower edges of the walls stand on the flat worktop. The new strand rests on two edges of the cool panels.

Strand direction: Guide the nozzle along the outside joint, briefly from one cool edge to the other. Cooling: Hold without moving until cool; touch only areas that were already cool. Tip access: The participant guides the pen from the outside; the helper keeps their fingers away from the active joint.