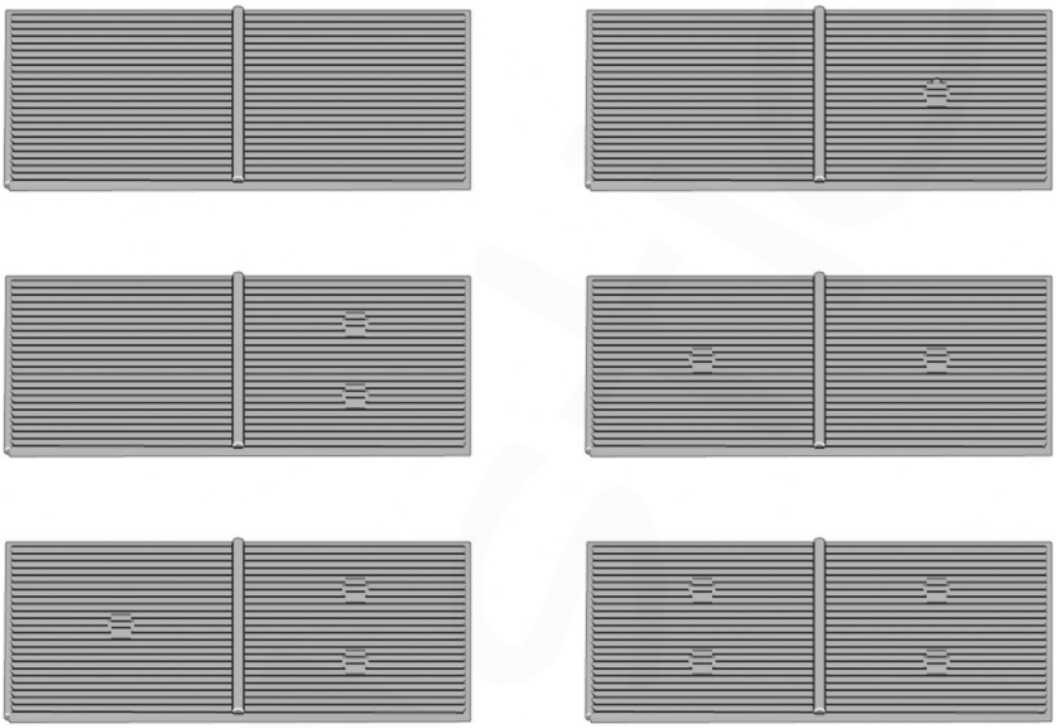
MAKE • DISCOVER • COLLECT

Mini dominoes: zero, one, two

Beginners aged 8+, teenagers, and adults; support adapted to their skills and the pen’s requirements.
• 60–95 min total; pen 40–65 min



Build six 0–2 domino tiles using a single PLA, check the pips, and play a two-player matching game.

Your outcome

A complete set of six 0–2 domino tiles.

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.

tools

☐	PLA pen with stand Use the manufacturer’s settings and adult help.	**1**

work surface

☐	Transparent pen mat At least 70 × 45 mm; resistant to the device’s operating temperature.	**1**

templates

☐	W01–W06 template sheet on A4 Scale 1:1 (100%), no fit-to-page; 20 mm check.	**1**

measurement

☐	Ruler Scale, dimensions, and pip positions; measure only cooled PLA. Move the ruler away before extruding.	**1**

Filament — amounts include extra

☐	PLA 1.75 mm — one selected color	**5.6 m · ≈ 16.8 g**

Total filament: 5.6 m · approximately 16.8 g

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

Before you start

Settings and hot nozzle

Choose PLA compatible with the device. Select the settings specified in the pen instructions. Do not touch the nozzle; return the pen to its stand. An adult assists with operation.

1. Print the W01–W06 sheet at 100%, with no fit-to-page. Use a ruler to check the 20 mm segment.
2. W01→D00, W02→D01, W03→D02, W04→D11, W05→D12, W06→D22. On the sheet, W02, W04, and W06 are rotated 90°. For use, position the selected template with its long side horizontal.
3. Check that the template is visible through the mat on a flat table. Prepare space for six tiles, the stand, and adult help.
4. Choose your own PLA color for the whole set. Work on a flat mat. Before making the next tile, let the previous one cool and place it beside your workspace. Let the tile cool before measuring, and move the ruler away before adding PLA.

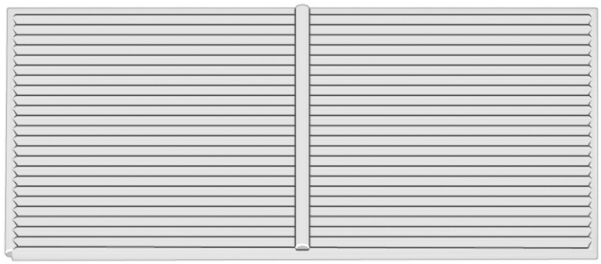
Retained source estimate: 60–95 min total, including 40–65 min of pen work with fixes. This is a guide for home or a workshop, with no session limit; it is not a measurement. Adjust breaks to the working pace and the time the PLA needs to cool.

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 / 09 • Session 1

Tile 0–0 · D00



1. Closed outline — D00

2. First half filled — D00

4. Center divider — D00

NOW Tile 0–0

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

PARTS FOR THIS STAGE

1 × Tile 0–0 · PLA | template W01

Card 1; W01 → D00. Outline, full fill, divider, and the correct number of pips. Check and repair if needed: card 7.

W01 → D00. Close the outline. First fill half, then fill the entire inside with parallel strands from edge to edge, with their sides touching. After it cools, measure the center: 25 mm from the short edge. Move the ruler away and make the divider across the width of the tile. Leave both halves without pips. Let it cool before use.

✓ **Check**

About 50 × 25 mm; full fill and a divider. Number of pips: 0 on the left, 0 on the right; the marks are joined to the base.

If it does not work

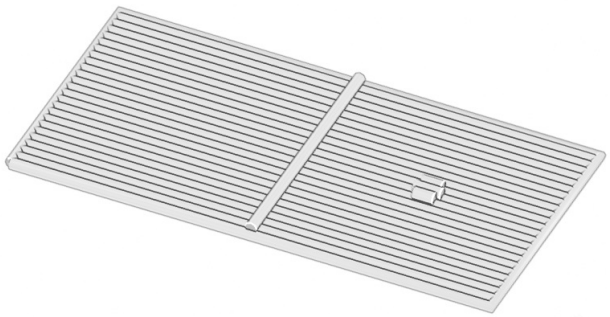
Bridge a gap in the outline or fill with a fresh PLA strand on the mat.

Tile 0–0 · D00 — construction details

3. Full fill — D00

STAGE 02 / 09 • Session 1

Tile 0–1 · D01



Entire finished D01 tile

1. Closed outline — D01

2. First half filled — D01

NOW Tile 0–1

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

PARTS FOR THIS STAGE

1 × Tile 0–1 · PLA | template W02

Card 2; W02 → D01. Outline, full fill, divider, and the correct number of pips. Check and repair if needed: card 7.

W02 → D01. Close the outline. First fill half, then fill the entire inside with parallel strands from edge to edge, with their sides touching. After it cools, measure the center: 25 mm from the short edge. Move the ruler away and make the divider across the width of the tile.

Add one pip to the right half: 12,5 mm from the right edge and 12,5 mm from the bottom edge. Measure positions on the cool base, then move the ruler away. Make each pip from three touching strands, forming a 4 × 3 mm foot joined to the base. Let it cool before use.

✓ **Check**

About 50 × 25 mm; full fill and a divider. Number of pips: 0 on the left, 1 on the right; the marks are joined to the base.

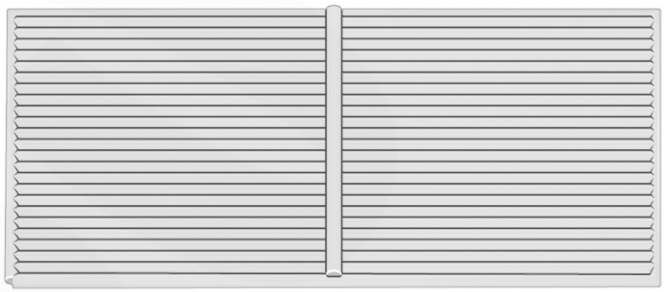
If it does not work

Bridge a gap in the outline or fill with a fresh PLA strand on the mat. Fix a weak pip as shown on card 7.

Tile 0–1 · D01 — construction details

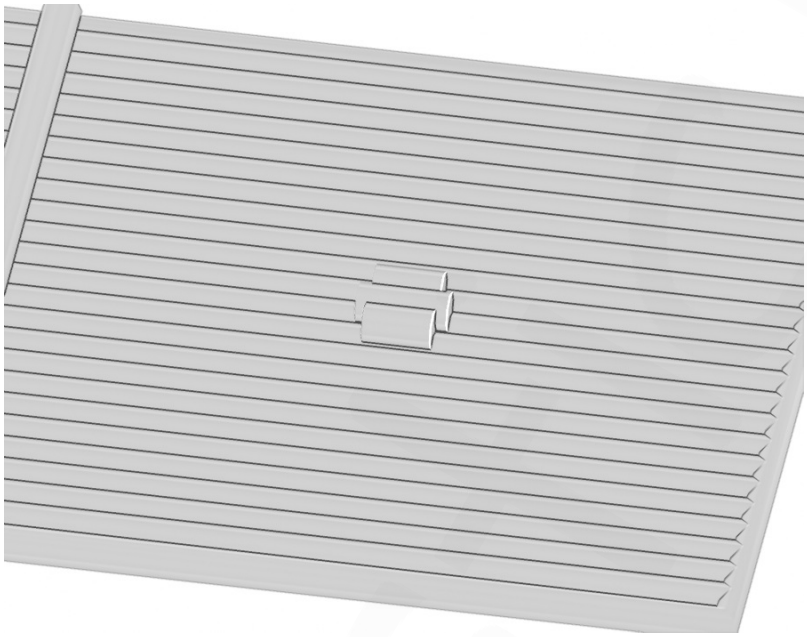
3. Full fill — D01

4. Center divider — D01



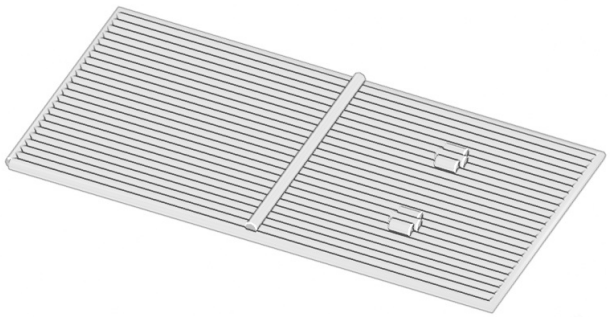
Tile 0–1 · D01 — construction details

5. Pip 1 joined to the base — D01



STAGE 03 / 09 • Session 1

Tile 0–2 · D02



Entire finished D02 tile

1. Closed outline — D02

2. First half filled — D02

NOW Tile 0–2

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

PARTS FOR THIS STAGE

1 × Tile 0–2 · PLA | template W03

Card 3; W03 → D02. Outline, full fill, divider, and the correct number of pips. Check and repair if needed: card 7.

W03 → D02. Close the outline. First fill half, then fill the entire inside with parallel strands from edge to edge, with their sides touching. After it cools, measure the center: 25 mm from the short edge. Move the ruler away and make the divider across the width of the tile.

Add two pips to the right half, one after the other: 12,5 mm from the right edge and 7,5 and 17,5 mm from the bottom edge. Measure positions on the cool base, then move the ruler away. Make each pip from three touching strands, forming a 4 × 3 mm foot joined to the base. Let it cool before use.

✓ **Check**

About 50 × 25 mm; full fill and a divider. Number of pips: 0 on the left, 2 on the right; the marks are joined to the base.

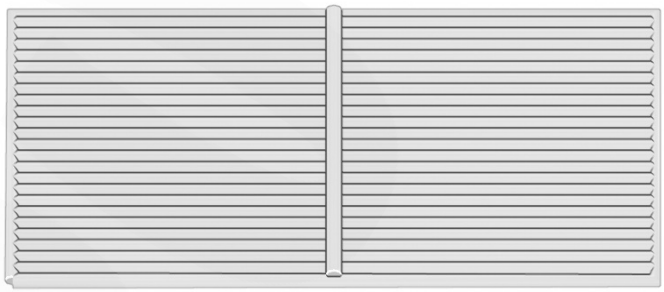
If it does not work

Bridge a gap in the outline or fill with a fresh PLA strand on the mat. Fix a weak pip as shown on card 7.

Tile 0–2 · D02 — construction details

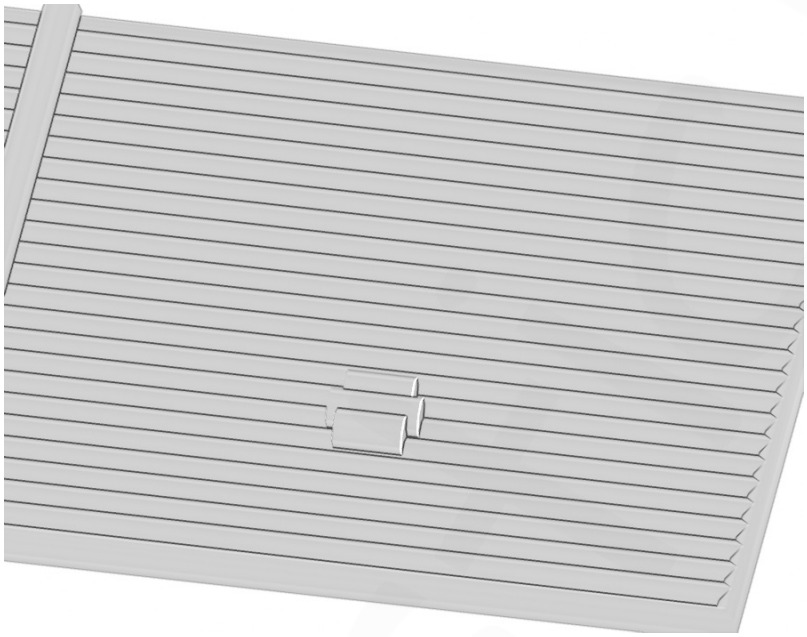
3. Full fill — D02

4. Center divider — D02

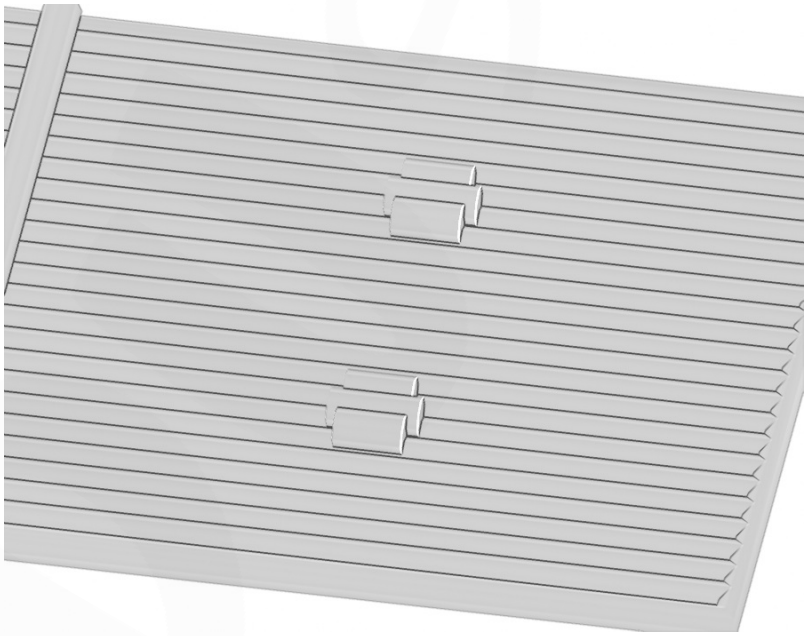


Tile 0–2 · D02 — construction details

5. Pip 1 joined to the base — D02

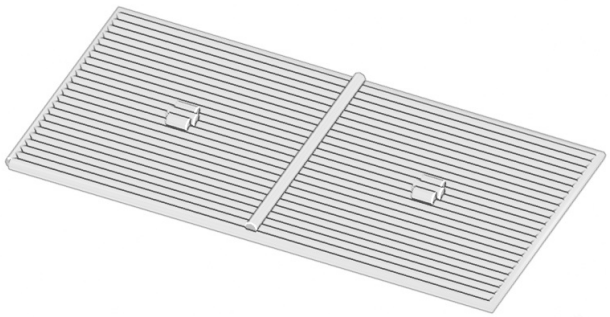


6. Pip 2 joined to the base — D02



STAGE 04 / 09 • Session 1

Tile 1–1 · D11



Entire finished D11 tile

1. Closed outline — D11

2. First half filled — D11

NOW Tile 1–1

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

PARTS FOR THIS STAGE

1 × Tile 1–1 · PLA | template W04

Card 4; W04 → D11. Outline, full fill, divider, and the correct number of pips. Check and repair if needed: card 7.

W04 → D11. Close the outline. First fill half, then fill the entire inside with parallel strands from edge to edge, with their sides touching. After it cools, measure the center: 25 mm from the short edge. Move the ruler away and make the divider across the width of the tile.

Add one pip in the center of each half: 12,5 mm from the left or right edge and 12,5 mm from the bottom edge. Measure positions on the cool base, then move the ruler away. Make each pip from three touching strands, forming a 4 × 3 mm foot joined to the base. Let it cool before use.

✓ **Check**

About 50 × 25 mm; full fill and a divider. Number of pips: 1 on the left, 1 on the right; the marks are joined to the base.

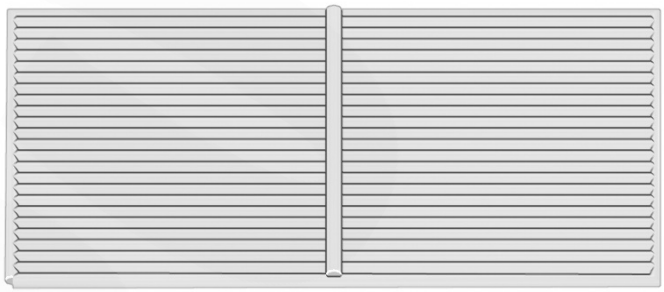
If it does not work

Bridge a gap in the outline or fill with a fresh PLA strand on the mat. Fix a weak pip as shown on card 7.

Tile 1–1 · D11 — construction details

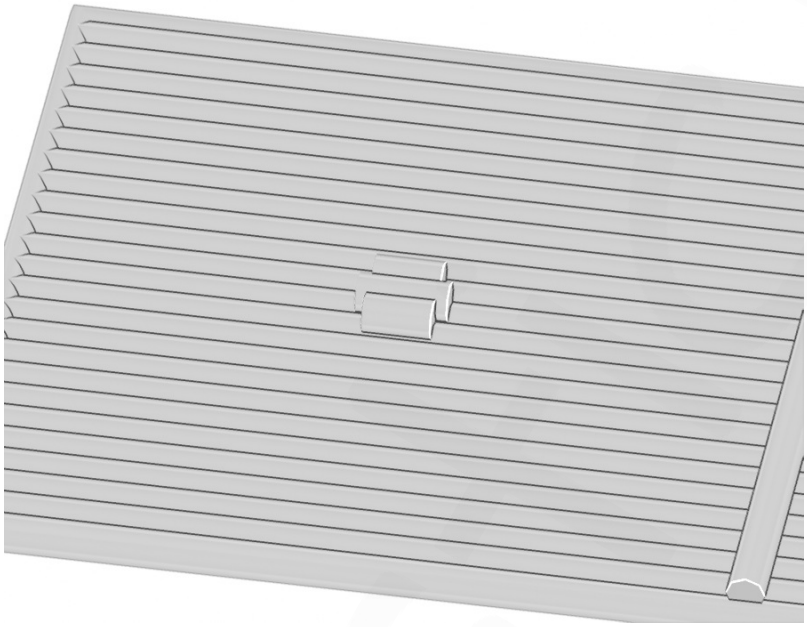
3. Full fill — D11

4. Center divider — D11

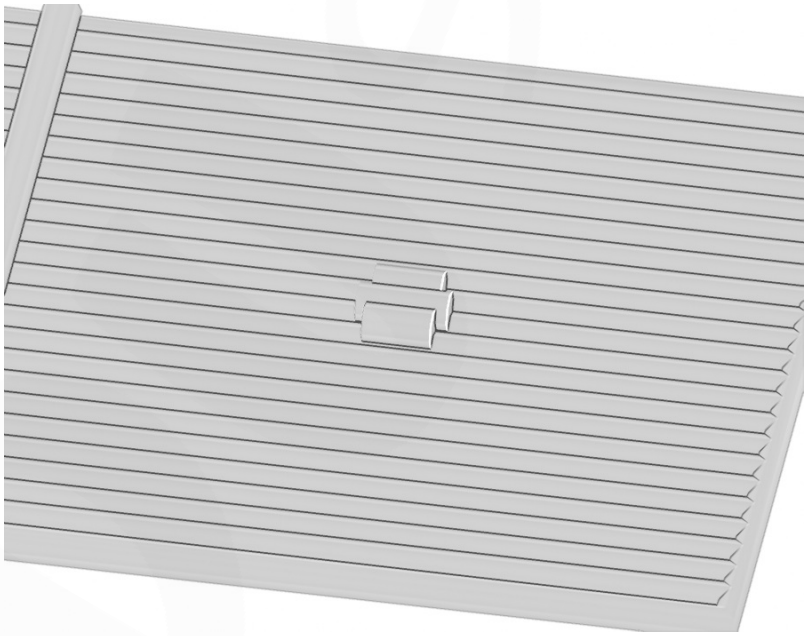


Tile 1–1 · D11 — construction details

5. Pip 1 joined to the base — D11

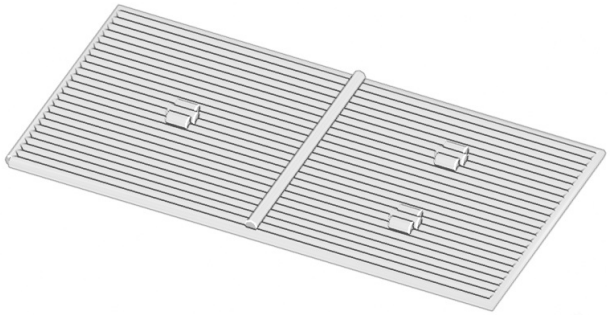


6. Pip 2 joined to the base — D11



STAGE 05 / 09 • Session 1

Tile 1–2 · D12



Entire finished D12 tile

1. Closed outline — D12

2. First half filled — D12

NOW Tile 1–2

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

PARTS FOR THIS STAGE

1 × Tile 1–2 · PLA | template W05

Card 5; W05 → D12. Outline, full fill, divider, and the correct number of pips. Check and repair if needed: card 7.

W05 → D12. Close the outline. First fill half, then fill the entire inside with parallel strands from edge to edge, with their sides touching. After it cools, measure the center: 25 mm from the short edge. Move the ruler away and make the divider across the width of the tile. Add a pip on the left: 12,5 mm from the left and bottom edges.

Add two on the right: 12,5 mm from the right edge and 7,5 and 17,5 mm from the bottom edge. Measure positions on the cool base, then move the ruler away. Make each pip from three touching strands, forming a 4 × 3 mm foot joined to the base. Let it cool before use.

✓ **Check**

About 50 × 25 mm; full fill and a divider. Number of pips: 1 on the left, 2 on the right; the marks are joined to the base.

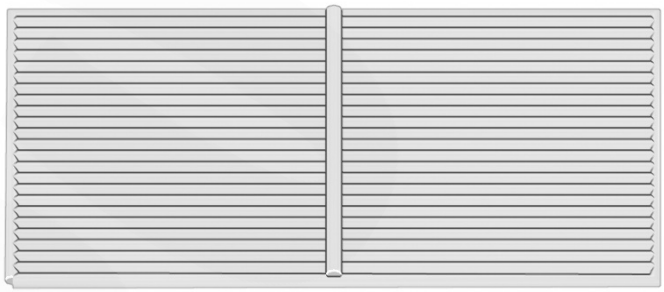
If it does not work

Bridge a gap in the outline or fill with a fresh PLA strand on the mat. Fix a weak pip as shown on card 7.

Tile 1–2 · D12 — construction details

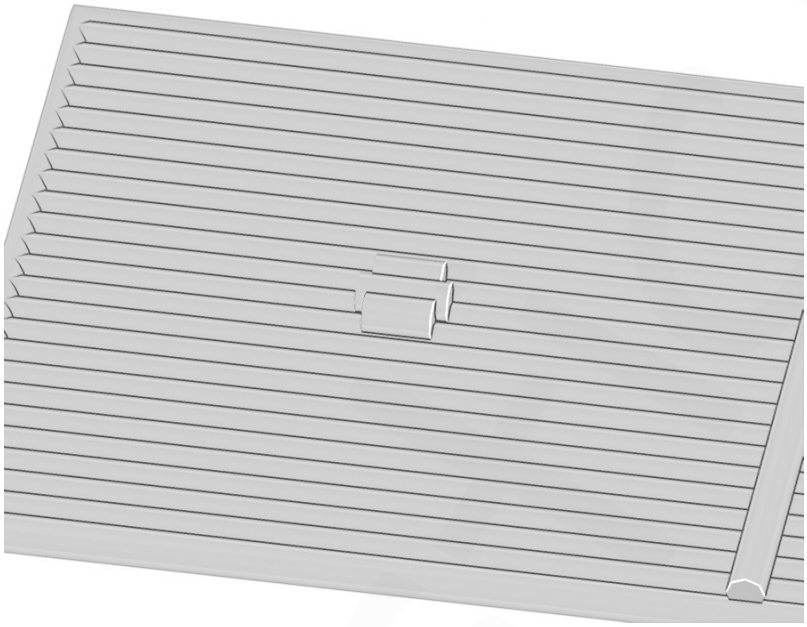
3. Full fill — D12

4. Center divider — D12

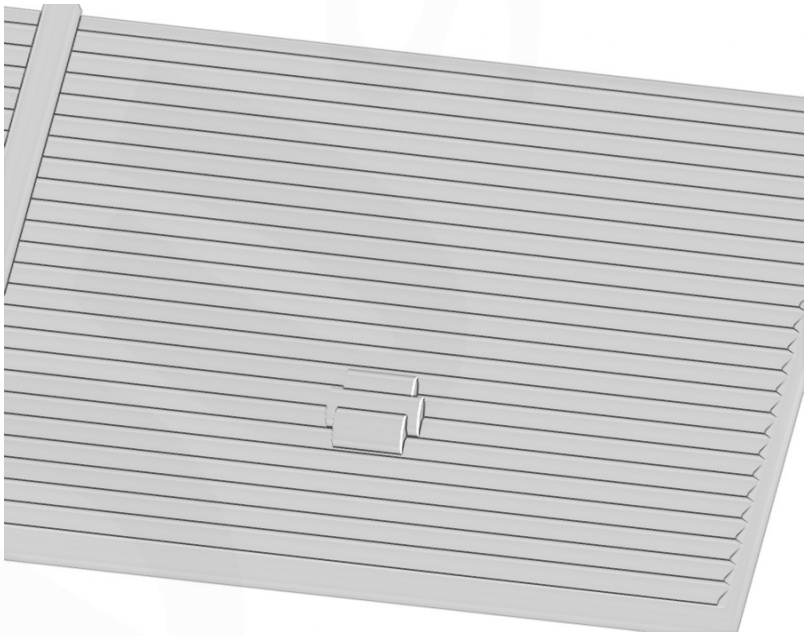


Tile 1–2 · D12 — construction details

5. Pip 1 joined to the base — D12

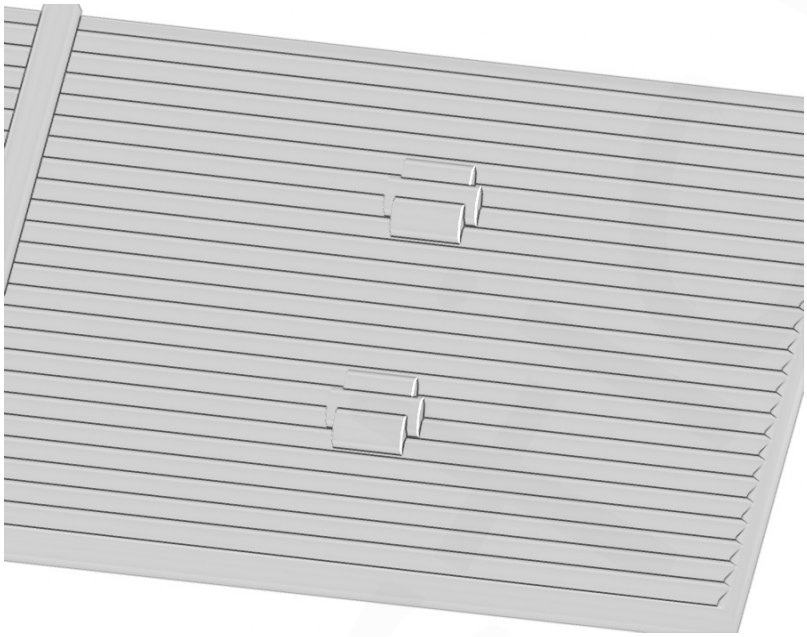


6. Pip 2 joined to the base — D12



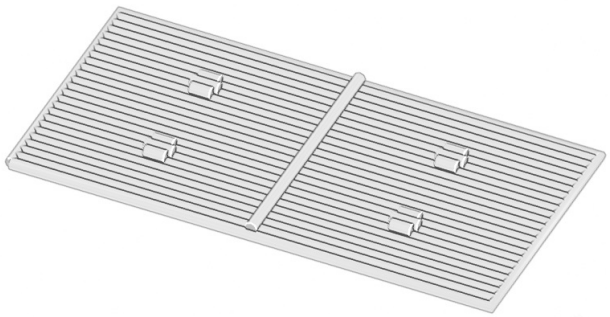
Tile 1–2 · D12 — construction details

7. Pip 3 joined to the base — D12



STAGE 06 / 09 • Session 1

Tile 2–2 · D22



Entire finished D22 tile

1. Closed outline — D22

2. First half filled — D22

NOW Tile 2–2

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

PARTS FOR THIS STAGE

1 × Tile 2–2 · PLA | template W06

Card 6; W06 → D22. Outline, full fill, divider, and the correct number of pips. Check and repair if needed: card 7.

W06 → D22. Close the outline. First fill half, then fill the entire inside with parallel strands from edge to edge, with their sides touching. After it cools, measure the center: 25 mm from the short edge. Move the ruler away and make the divider across the width of the tile.

First add two pips on the left, then two on the right: 12,5 mm from the matching short edge and 7,5 and 17,5 mm from the bottom edge. Measure positions on the cool base, then move the ruler away. Make each pip from three touching strands, forming a 4 × 3 mm foot joined to the base. Let it cool before use.

✓ **Check**

About 50 × 25 mm; full fill and a divider. Number of pips: 2 on the left, 2 on the right; the marks are joined to the base.

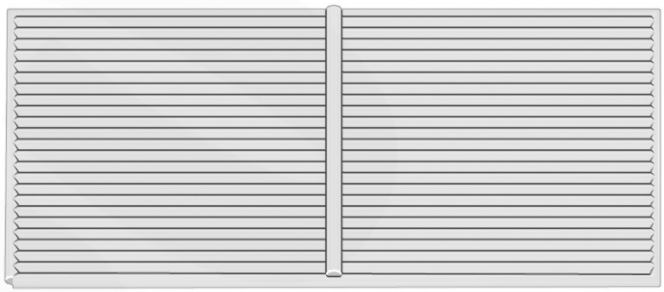
If it does not work

Bridge a gap in the outline or fill with a fresh PLA strand on the mat. Fix a weak pip as shown on card 7.

Tile 2–2 · D22 — construction details

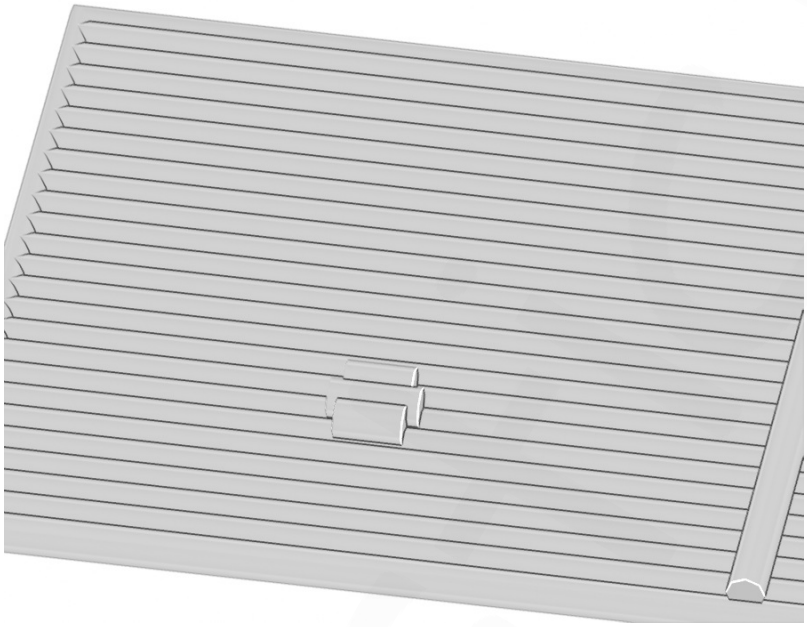
3. Full fill — D22

4. Center divider — D22

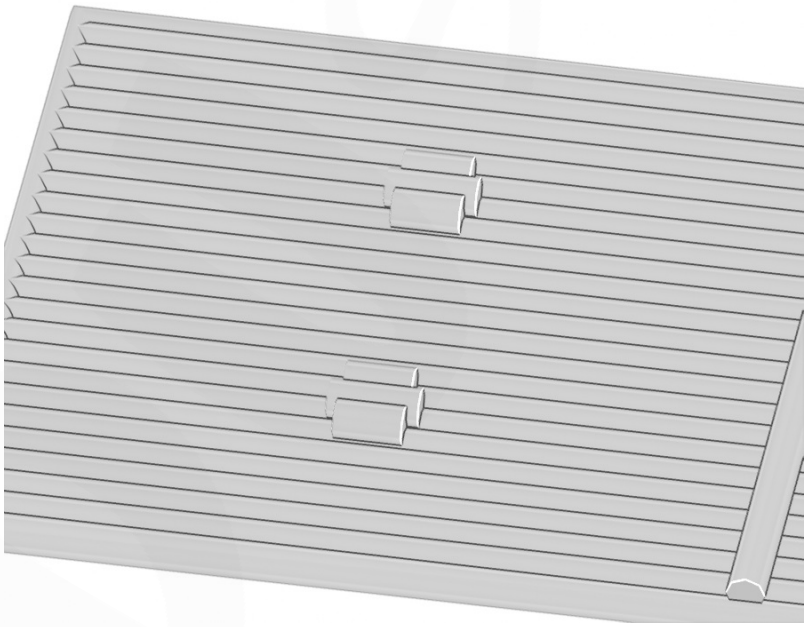


Tile 2–2 · D22 — construction details

5. Pip 1 joined to the base — D22

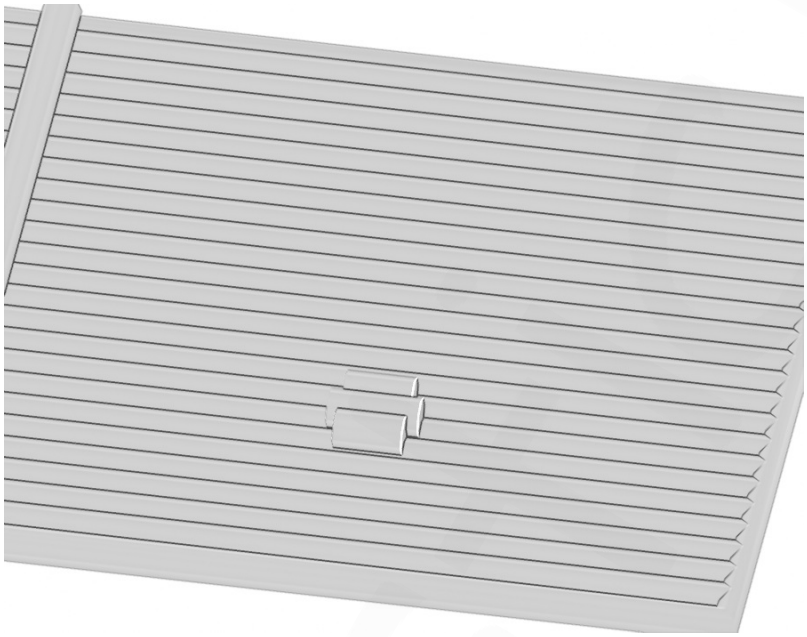


6. Pip 2 joined to the base — D22

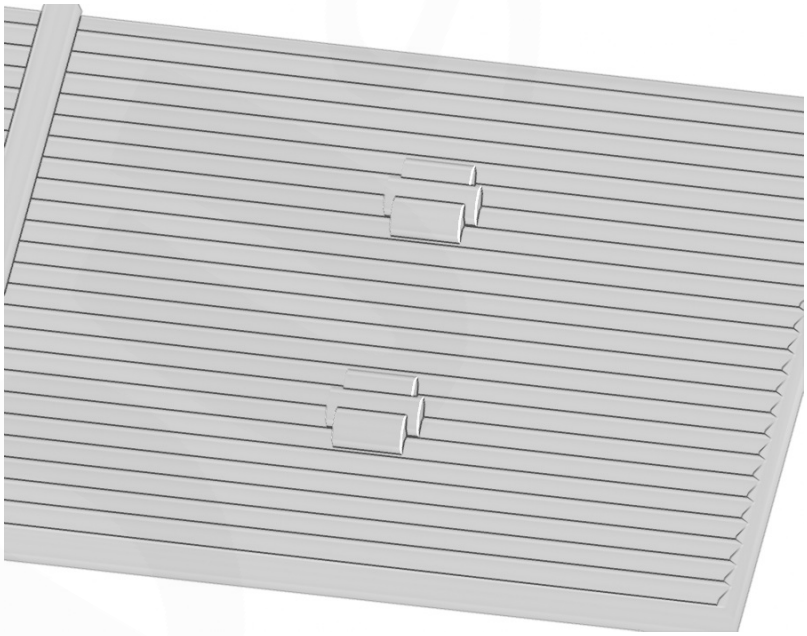


Tile 2–2 · D22 — construction details

7. Pip 3 joined to the base — D22

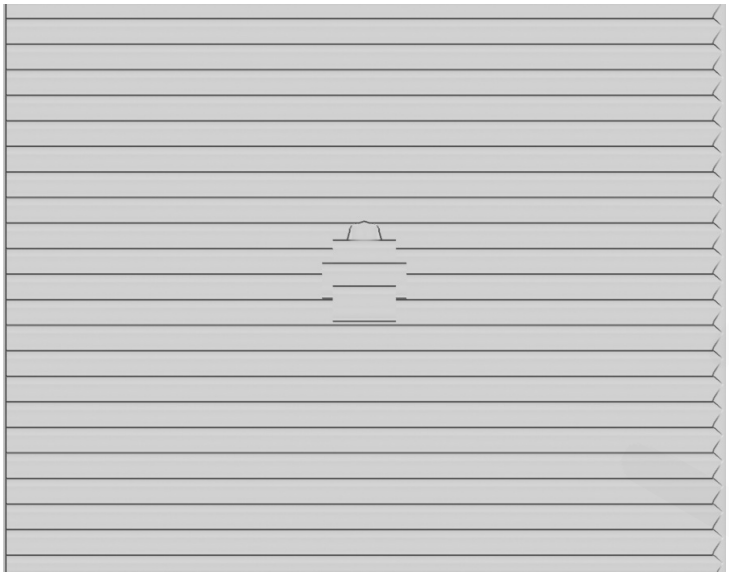


8. Pip 4 joined to the base — D22

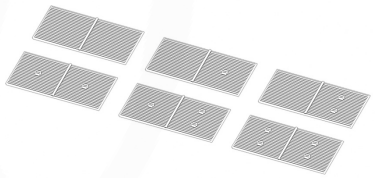


STAGE 07 / 09 • Session 1

Check the set; strengthen a pip if needed



2. Example: strengthened D01 pip foot



1. Complete set: 00, 01, 02, 11, 12, 22

NOW Complete model — all previously made parts

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

After the tiles cool, count six different pairs: 00, 01, 02, 11, 12, 22; six dividers and 12 pips in total. Check that the bases are continuous and sit firmly on the table. If a pip is weakly joined, place the tile on the mat and join its foot to the base with a short strand of the same PLA. The example shows D01.

Repair only where needed, then let the tile cool.

✓ **Check**

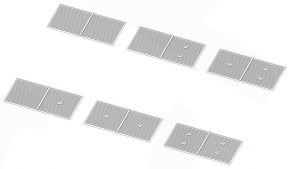
A complete set of six tiles; the pips are clear, firmly joined, and their counts have not changed.

If it does not work

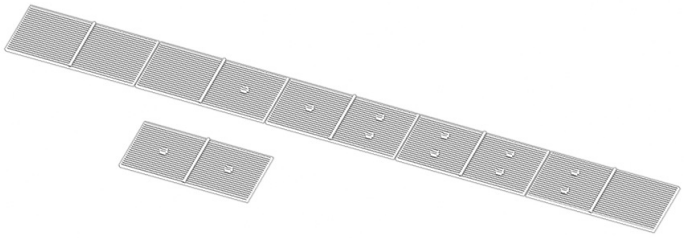
Fill the gap with fresh PLA on a flat mat. Check again after it cools; do not use a weakly joined tile yet.

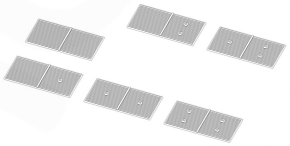
STAGE 08 / 09 • Session 1

Play the matching game



1. Example deal: A at the top, B at the bottom; three tiles each





2. A starts: 00

6. A rotates 02 to make 20 and wins; B keeps 11

NOW Complete model — all previously made parts

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

Two players shuffle the tiles face down and take three each. Do not draw more tiles. Decide who starts. Take turns adding one tile to an open end, matching equal numbers; zero matches only zero. Place doubles in line with the other tiles. If you can play, you must; otherwise, pass. The first player with no tiles wins.

After two passes in a row, the player with the lower total number of pips in hand wins; equal totals are a draw. Change the starting player in the next round. Example: A has 00, 02, 12; B has 01, 11, 22. To the right: A plays 00, B plays 01, A plays 12, B plays 22, then A rotates 02 by 180° and plays it as 20. A wins; B has 11.

✓ **Check**

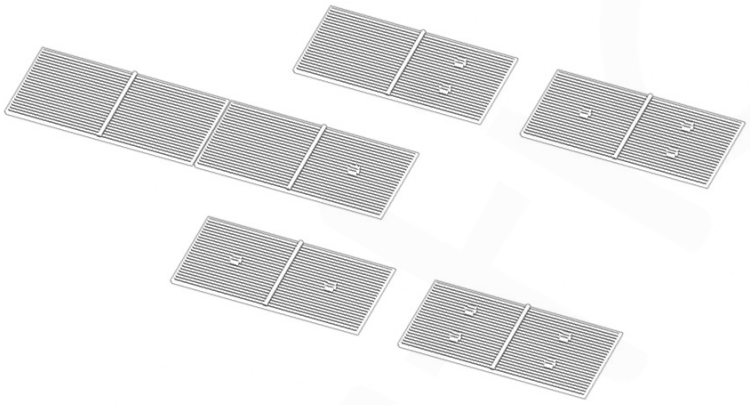
Matches: 0=0, 1=1, 2=2, 2=2. The chain has five tiles; the last one is 2–0.

If it does not work

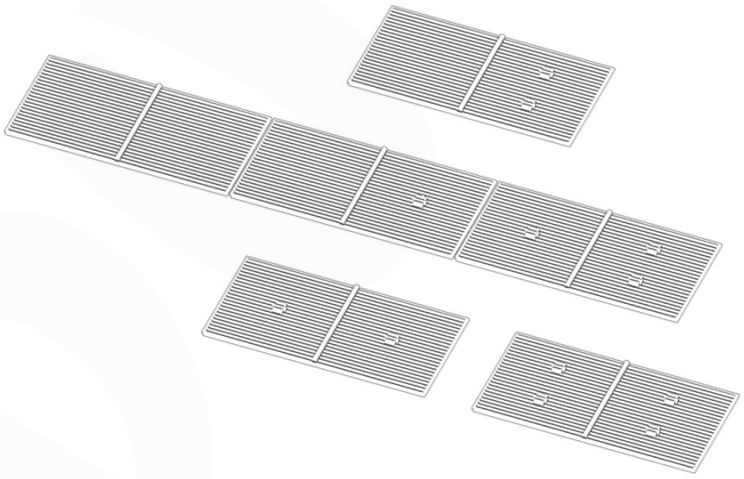
Undo a move that does not match; rotate the tile on the table or choose the other end. Do not change the pips.

Play the matching game — construction details

3. B adds 01 to the zero on the right

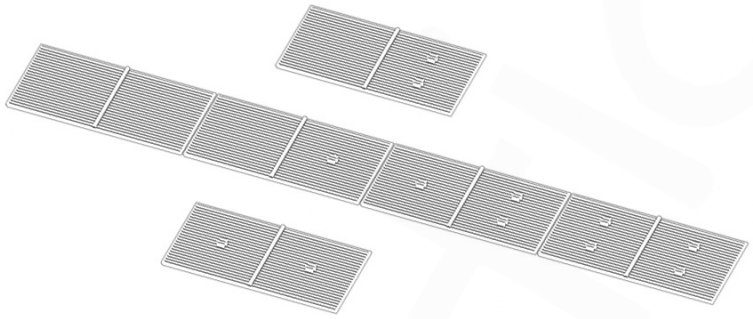


4. A adds 12 to the one on the right



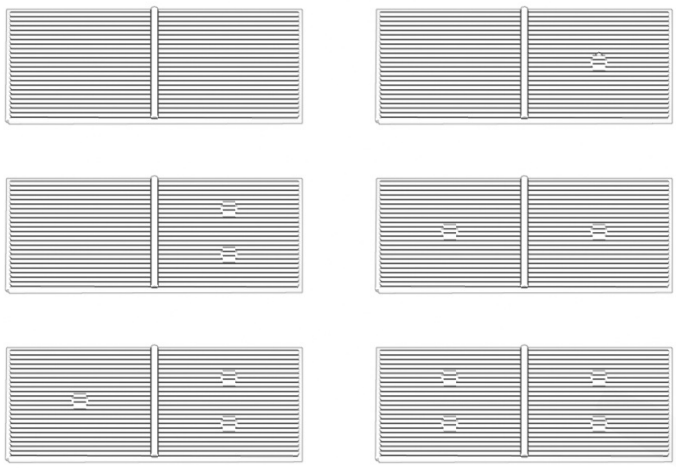
Play the matching game — construction details

5. B adds 22 to the two on the right



STAGE 09 / 09 • Session 1

Lay out the set after the game



Set laid out after the game

NOW Complete model — all previously made parts

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

After the game, move the cooled tiles one at a time to a clear space on the table. Place them dots up in three rows of two: 00 and 01, 02 and 11, 12 and 22. Leave about 12 mm between the tiles.

✓ **Check**

The six tiles lie separately. Each has two halves. The pairs are 0–0, 0–1, 0–2, 1–1, 1–2, and 2–2; 12 raised dots in total.

If it does not work

Move apart any tiles that are touching. Turn a cooled tile around if its halves are in reverse order.

Finished — check the outcome

✓ **Check**

Each pair 00, 01, 02, 11, 12, 22 appears exactly once; the tiles are approximately 50 × 25 mm.

✓ **Check**

Each base has full coverage, an integral divider, and legible halves. There are 12 firmly bonded pips in total.

✓ **Check**

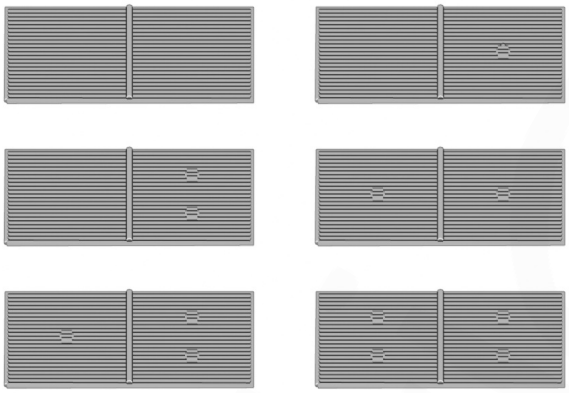
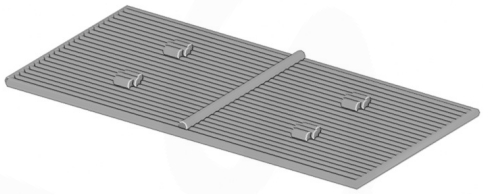
The cooled tiles lie flat, have no cracks or loose strands, and can be used for a valid game.

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