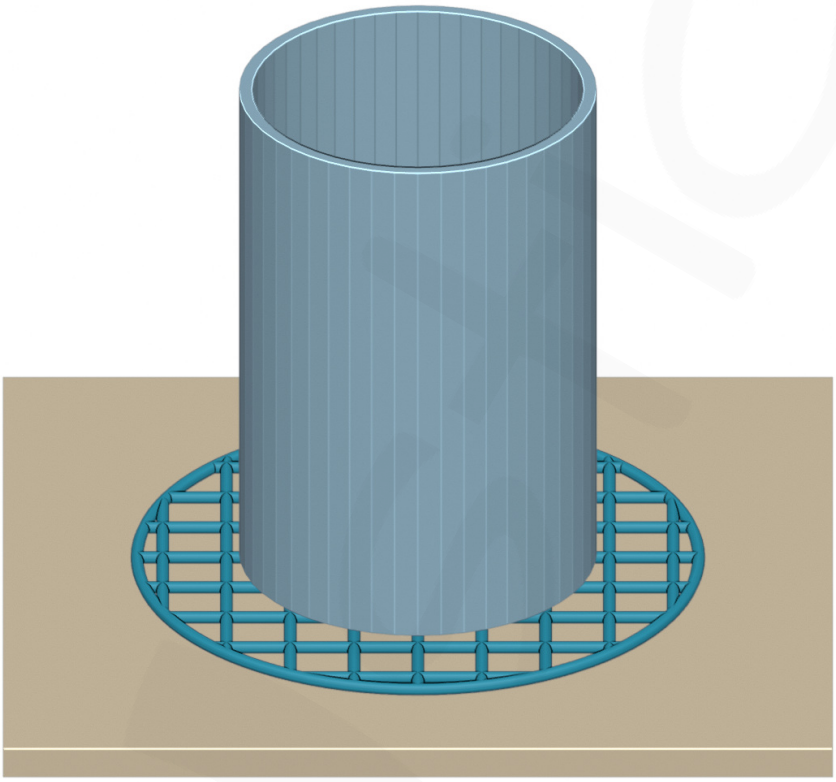
MAKE • DISCOVER • COLLECT

Geometric pattern coaster

Beginners of different ages; assistance matched to skills and device instructions. • 30–50 min total; pen 20–35 min — estimate



Create a round 90 mm coaster with your own PLA colour pattern. Join the short lines into an even grid and try it under a glass with a cold drink.

Your outcome

Make an even surface from a repeating motif.

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

What you need

Additional items are needed. Prepare the complete list below before starting.

base

- [ ] 3D pen for PLA, with power supply and pen stand — **1**
  per person working
- [ ] Transparent mat from the kit — **1**
  for using the PLA pen on a level worktop

template

- [ ] Full pattern printed on regular A4 paper — **1**
  in the selected language, under the work mat

tool

- [ ] Ruler — **1**
  for checking the 20 mm segment on the printout

extra

- [ ] Glass with a cold drink — **1**
  with a flat base that fits on the coaster

tool

- [ ] Scissors for small, cool PLA strands — **1**
  for a local correction; to be used by a person with suitable skills

Work area and support

- [ ] Level, clean worktop — **1**
  Work area, support, and stability test.

Filament — amounts include extra

- [ ] PLA 1.75 mm — Teal — **3.0 m · ≈ 9.0 g**

Total filament: 3.0 m · approximately 9.0 g

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

Before you start

1 Print W01 at 100% scale and use a ruler to check the 20 mm segment. Place the pattern on a level worktop, then put the transparent mat from the kit on top.

2 Set up the pen for PLA by following its instructions. Choose your colours and pattern: for example, alternate two colours in successive rows. You can also use just one colour.

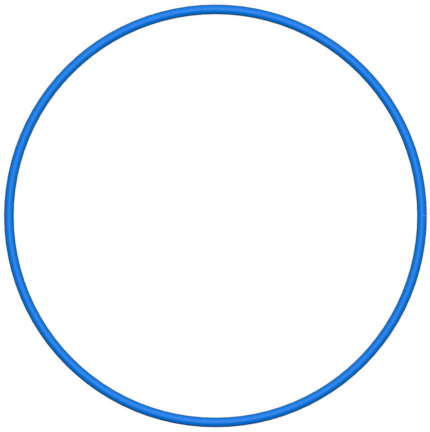
Estimate for one 90 mm coaster and a beginner. Owner's decision of 21.09.2026: at home and in a workshop, time is not a limit. No physical test has been performed.

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 / 04 • Session 1

Outline



Closed outline

NOW Round 90 mm coaster

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

PARTS FOR THIS STAGE

1 × Round 90 mm coaster · PLA | template W01

On the transparent mat, make the outline, the horizontal rows and then the short vertical lines, following W01. Join the ends of the strands and bring the vertical lines up to the sides of the horizontal lines. Keep everything in one even 2 mm layer. Finished cross-section [mm]: 2 × 2.

Support: The transparent mat from the kit, placed on a level worktop, supports the entire underside while you apply the PLA; this equipment is not a separate step or a model to make.

Strand direction: Make the horizontal segments from the outline to the marked positions of the future W01 intersections, butt-joining successive segments, row by row. Then join the vertical segments to the sides of the horizontal ones in the same layer. Cooling: Leave the piece flat on the mat until completely cool and rigid.

Do not move the fresh joints. Tip access: Open access from above for the nozzle to every segment.

Guide the PLA around the W01 circle on the mat and join the end to the start. Make an even outline about 2 mm wide in one layer. Choose its colour.

Check

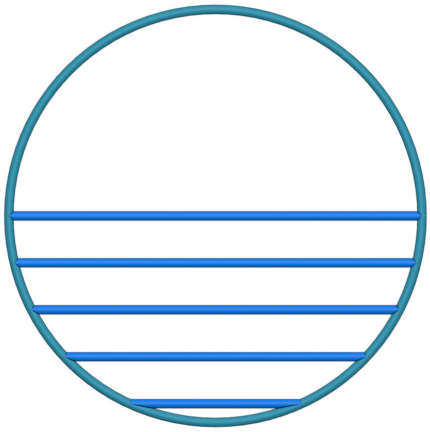
The outline is closed and even.

If it does not work

Join the gap with a short strand of PLA on the mat.

STAGE 02 / 04 • Session 1

First rows of the pattern



First five rows joined to the outline

NOW Round 90 mm coaster

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

Start with the bottom row of W01. Draw short segments from the outline to each marked crossing until you reach the opposite edge. Start each new segment at the end of the previous one and continue straight away, without making a bump. Make the first five rows this way.

Choose a colour pattern, such as alternating two colours, and follow it in each row.

✓ **Check**

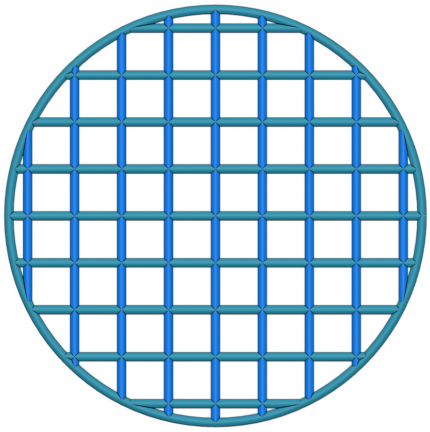
Each row joins the outline at both ends, and the segments meet end to end.

If it does not work

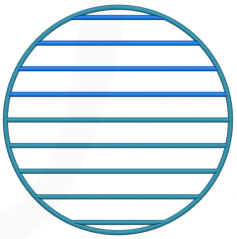
Fill in the missing joint on the mat without adding a second layer.

STAGE 03 / 04 • Session 1

Finish your chosen colour pattern



Complete grid with short vertical lines



Completed horizontal rows

NOW Round 90 mm coaster

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

Finish the remaining horizontal rows in your colour pattern. Then add short vertical lines following W01: use them to join neighbouring horizontal lines and connect the pattern to the outline. Bring them up to the sides of the finished strands without passing over the top. Make every line on the mat in one even layer.

Wait until the piece is completely cool.

✓ **Check**

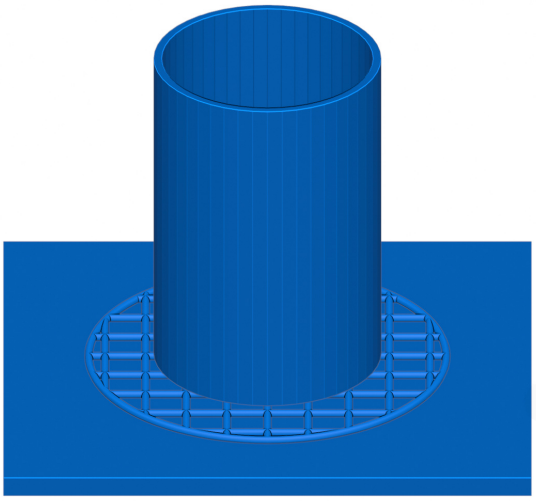
The whole pattern is joined, with no loose ends or tall bumps.

If it does not work

Fill in only the missing segment or joint. Keep the pattern at an even height.

STAGE 04 / 04 • Session 1

Use under a cold drink



Test under a glass with a cold drink

NOW Complete model — all previously made parts

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

Place the cold coaster on a level worktop. Put a glass with a cold drink in the centre, making sure its flat base fits on the coaster. Gently touch the glass from two sides without tilting it. Check that it stands steadily and look at your pattern under the glass.

✓ **Check**

The glass stands without wobbling. Write down or say what you notice in your test.

If it does not work

Set the glass aside and check the worktop and the bottom of the glass. Ask an adult to help with any cooled strand that sticks out. Repair a loose joint with PLA on the mat, let the whole piece cool and repeat the test. If the coaster is warped or has tall joints, make it again.

Finished — check the outcome

Check

All the pattern lines are joined to one another and to the outline, with no loose ends.

Check

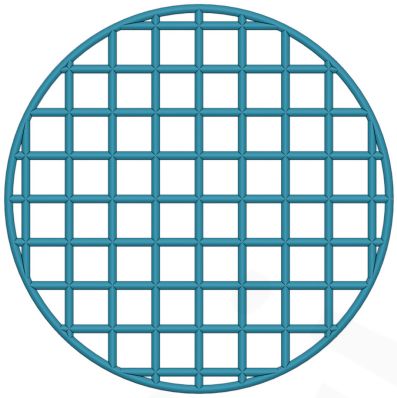
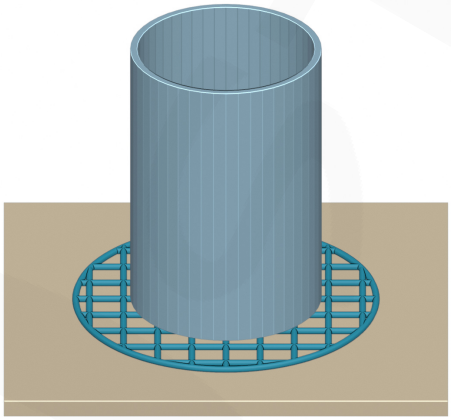
A glass with a cold drink stands on the coaster without wobbling.

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