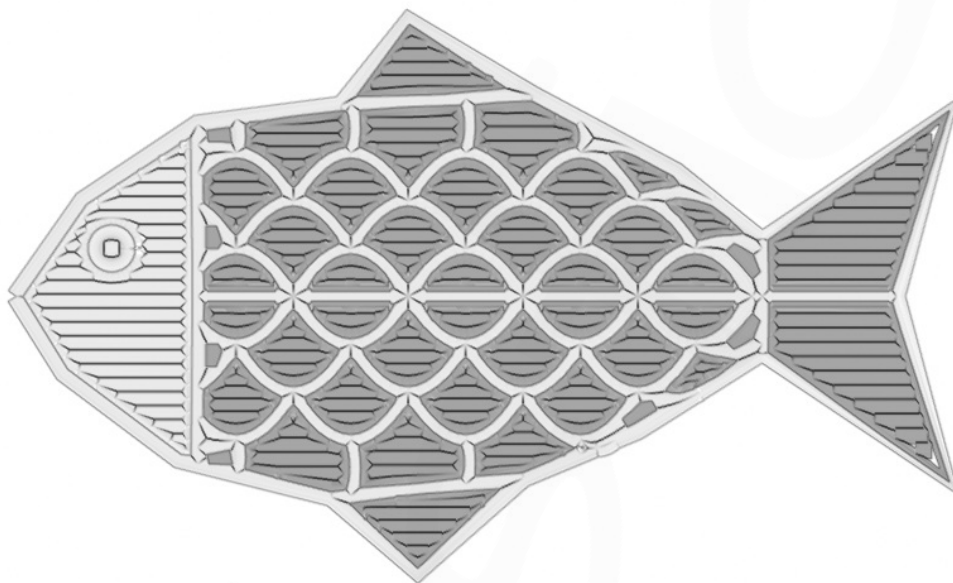


MAKE • DISCOVER • COLLECT

Fish with a scale rhythm

Beginners aged 8+, with adult help suited to their skill level • Pen: 40-60 min; total: 50-80 min (estimate)



A colorful, flat fish with a head, an eye, and scales in your chosen PLA colors. Fill the areas with adjoining strands and create your own color rhythm.



Your outcome

Repeat short arcs and fill the scales with adjoining PLA strands. Choose your own colors and their rhythm on one connected fish.

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.

Basic set

☐	3D pen for 1.75 mm PLA Settings and supervision according to the device instructions.	1 pc.
☐	Pen stand Place the device down as instructed.	1 pc.
☐	Transparent mat included in the kit A mat for use with this pen; the entire fish pattern lies underneath it.	1 pc.
☐	W01 printout on A4 paper Print at 100%; check 20 mm before use.	1 sheet
☐	Ruler Checking the scale and strand width.	1 pc.

Filament — amounts include extra

☐	PLA 1.75 mm — turquoise	1.9 m · ≈ 5.7 g
☐	PLA 1.75 mm — yellow	2.4 m · ≈ 7.2 g
☐	PLA 1.75 mm — dark	0.1 m · ≈ 0.3 g
☐	PLA 1.75 mm — coral	1.1 m · ≈ 3.3 g
☐	PLA 1.75 mm — purple	0.9 m · ≈ 2.7 g

Total filament: 6.4 m · approximately 19.2 g

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

Before you start

Hot nozzle

Do not touch the hot nozzle or fresh PLA. Ask an adult for help with the settings and changing colors; use the pen and mat according to the device instructions.

- 1 Print W01 at 100%, without fitting it to the page. Use a ruler to check the 20 mm segment.
- 2 Slide the pattern under the transparent mat included in the kit and lay it flat on the table: snout on the left, tail on the right.
- 3 Choose PLA colors for the outline, head, eye, and scales. An adult helps change the PLA according to the pen instructions.
- 4 In the test area, make a strand about 2 mm wide, in one layer. Adjust your speed to suit the PLA and the device.

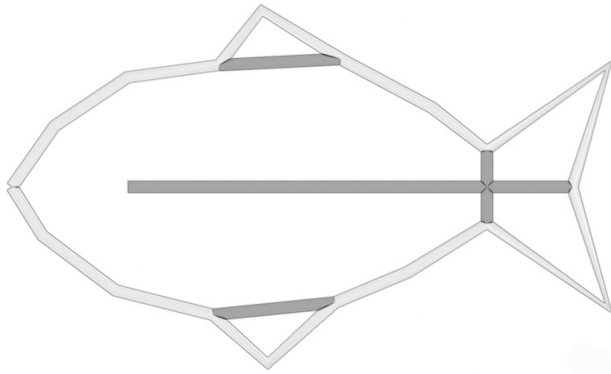
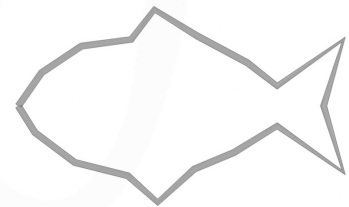


How to read the instructions

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 / 05 • Session 1

Fish outline



Outline with fins and tail

Axis and bases

NOW Outline and connected scales

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

PARTS FOR THIS STAGE

1 × Outline and connected scales · PLA | template W01

→ T001 • Techniques — reference appendix

Trace the outline on W01: start at the snout, go past the fins and tail, and return to the start. Add the axis from the head boundary to the tail, the fin bases, and the tail crossbar.

✓ Check

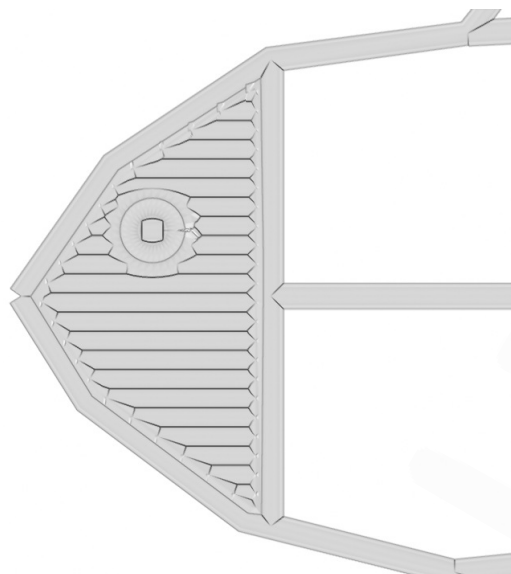
The outline is closed, and the axis and bases reach the edges.

If it does not work

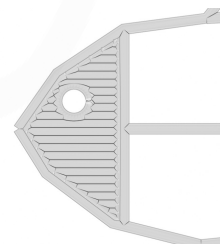
Bridge the gap with a short strand of the same PLA.

STAGE 02 / 05 • Session 1

Head and eye



Head boundary and first strands



Filled head with space for the eye

Eye joined to the head

NOW Head fill · Outline and connected scales · Eye in the head

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

PARTS FOR THIS STAGE

1 × Head fill · PLA | template follow the written method

1 × Eye in the head · PLA | template follow the written method

→ T002, T003 • Techniques — reference appendix

At the mouth, draw the head boundary. Fill it with adjacent strands and a pass along the edge. Go around the eye opening, then fill it with dark PLA. Join the strands side-to-side in a single layer.



Check

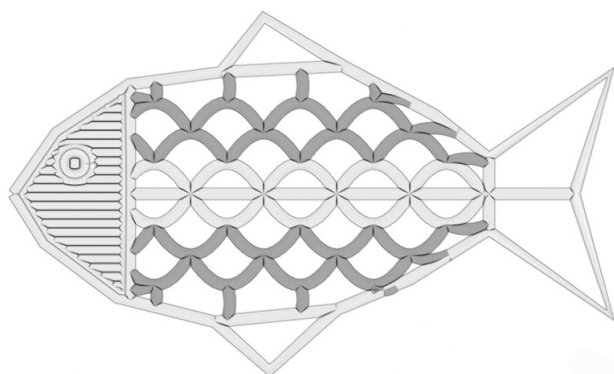
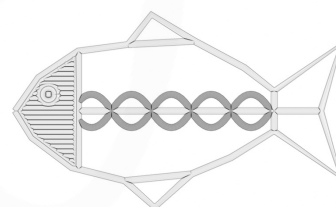
The head is fully filled and the eye is visible; the strands join side-to-side.

If it does not work

Close the gap with a short strand joined to the surrounding fill.

STAGE 03 / 05 • Session 1

Draw the scales



First rows of arcs

Connected scales behind the head

NOW Outline and connected scales

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

Behind the head, draw arcs on both sides of the axis. Add the next rows by following W01, and join the ends at the edge to the outline.



Check

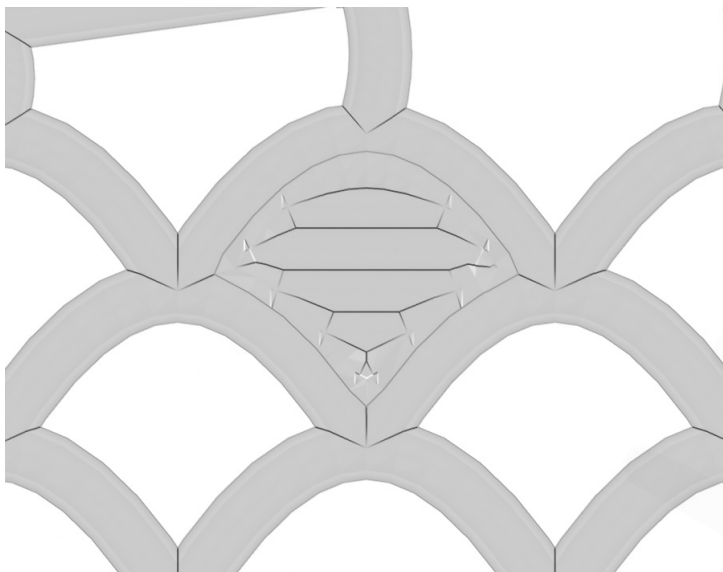
The scales are visible, and the arc ends connect to other strands.

If it does not work

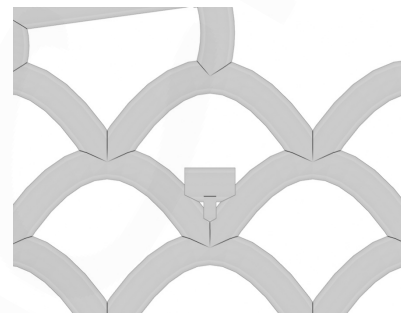
Join a loose end to the nearest line in the pattern.

STAGE 04 / 05 • Session 1

Fill one scale



The whole first scale



Two adjoining strands in one scale

NOW First scale and yellow example areas

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

PARTS FOR THIS STAGE

1 × First scale and yellow example areas · PLA | template follow the written method

→ T004 • Techniques — reference appendix

Choose a PLA. Start with two strands along W01 in one scale. Add more strands side by side and a pass along the edge, joining them side-to-side. Fill the area in the same layer.



Check

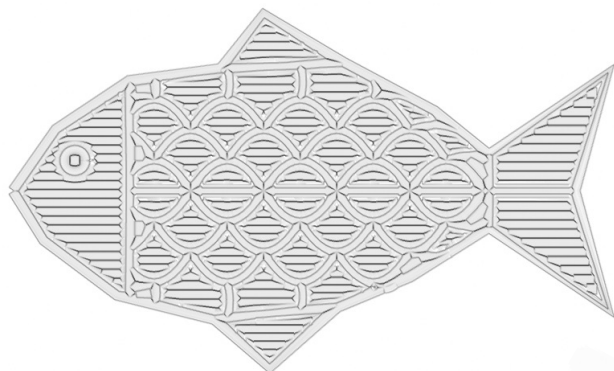
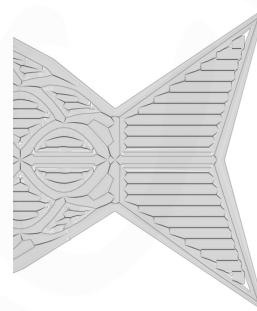
One scale is full, and its strands join the edge and one another.

If it does not work

Add a short strand in the gap, joining it to the neighboring strands.

STAGE 05 / 05 • Session 1

Your colors and pattern



Close-up of the joins at the tail

Example of a finished fish — choose your own colors

NOW Coral example areas · Purple example areas · First scale and yellow example areas

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

PARTS FOR THIS STAGE

1 × Coral example areas · PLA | template follow the written method

1 × Purple example areas · PLA | template follow the written method

→ T005, T006 • Techniques — reference appendix

Fill the remaining scales in the same way. Choose your own pattern: alternate two colors or make a rainbow. Choose colors for the fins and tail too. The fish in the picture is an example; yours can have different colors. Wait until the fish has cooled completely.



Check

The head, eye, and colorful scales are visible. Show your color rhythm; all the areas connect to the fish.

If it does not work

If you see a gap, fill it with a strand joined to the edge of the area.

Finished — check the outcome



Check

The head, eye, and colorful scales are visible. Show your color rhythm; all the areas connect to the fish.



Check

The filled areas form one flat piece; there are no loose scales or separate eye.



Check

The fish outline, fins, tail, and dimensions match W01.

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.

Techniques — reference appendix

T001 • Stage 1

1 × Outline and connected scales · PLA | template W01

Trace the outline, axis, and bases on W01. Add the head boundary, then the rows of arcs. Join the ends to the existing strands.

T002 • Stage 2

1 × Head fill · PLA | template follow the written method

Start with strands side by side. Complete the head and connect the fill with a pass along the edge and around the eye opening, in the same layer.

T003 • Stage 2

1 × Eye in the head · PLA | template follow the written method

With dark PLA, draw and fill a small circle in the space you left. Join its edge to the yellow fill, in the same layer.

T004 • Stage 4

1 × First scale and yellow example areas · PLA | template follow the written method

Start with two strands along W01. Add adjacent strands and a pass along the scale edge. Fill the selected areas this way.

T005 • Stage 5

1 × Coral example areas · PLA | template follow the written method

Fill your chosen areas with adjoining strands connected to the edge. Coral is only an example: you can choose your own PLA color.

T006 • Stage 5

1 × Purple example areas · PLA | template follow the written method

Fill more areas in the same way, including the fin and tail areas. Purple is an example; keep your chosen color rhythm.