

— CASE STUDY // PRINT-IN-PLACE DESIGN

Ten joints. Two colors. Zero assembly.

Wiggle Toys are print-in-place desk buddies for the shop, the office or the kids. Every joint prints already assembled, the arms ball-joint, the base takes a magnet, and the face is its own part so it prints in any color. One body, 85 toys, all free.

TOYS

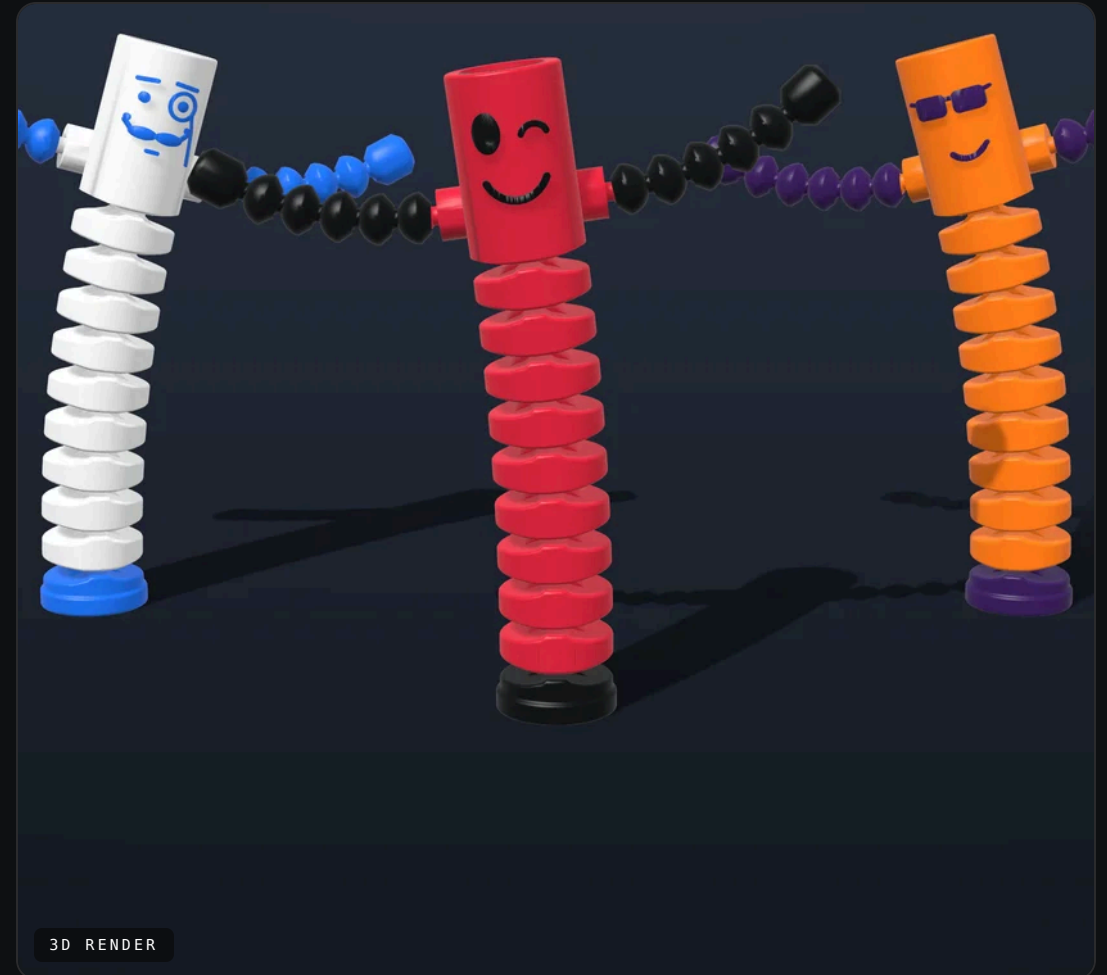
85 across 10 collections

PRINT PROFILES

18, one toy per plate

STATUS

Test prints running,
MakerWorld listing in draft



3D RENDER

— THE IDEA

A toy is a good place to show your joints

The idea

A desk toy that shows what print-in-place can do. Ten stacked joints that swing about 22 degrees each, ball-joint arms, a magnet base, and a face that prints in its own color. One file, no assembly, no supports.

The engineering

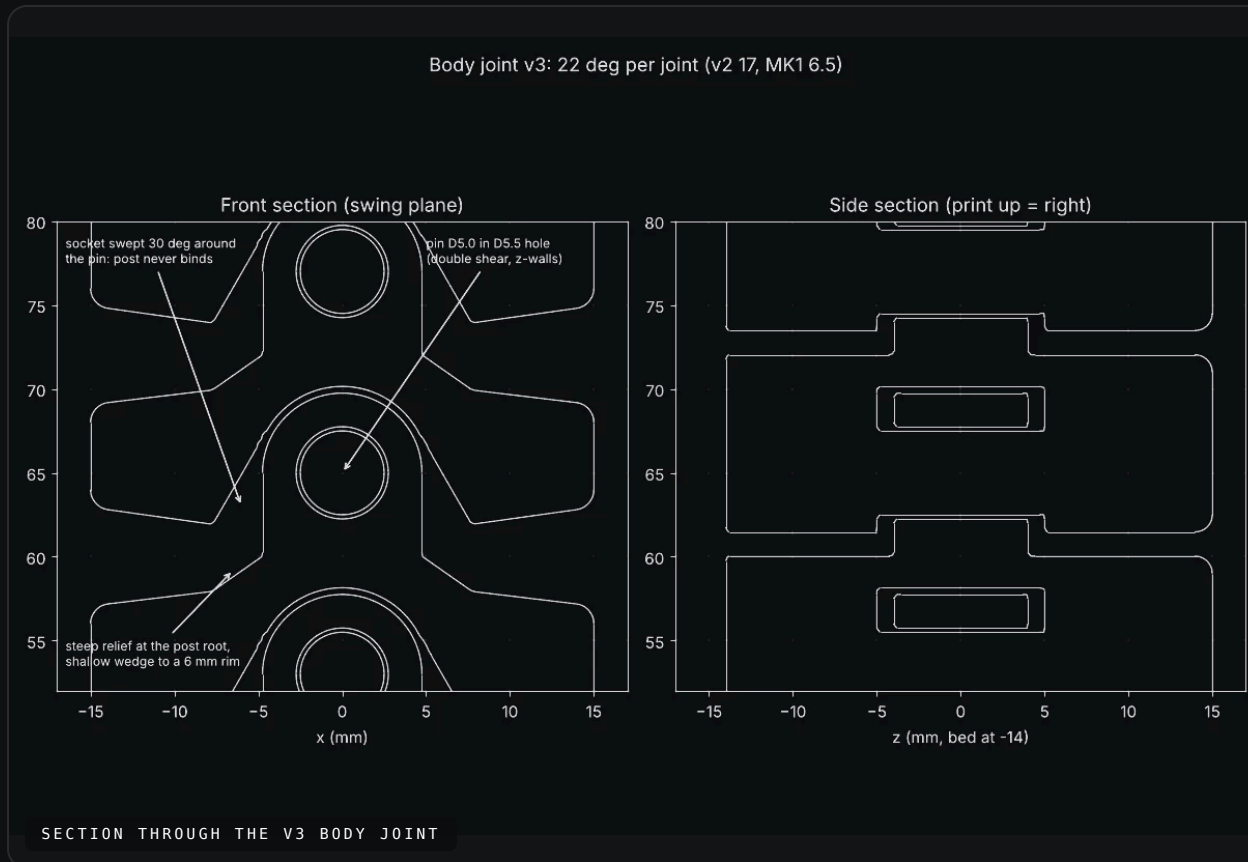
Every joint is a pin in a hole with a swept socket, so the post never binds and the pin sits in double shear. Clearances were set for a 0.4 mm nozzle and checked on the mesh, not guessed.

The result

85 toys built from one parametric body: faces, characters, 21 textures, lattice and topo structures, 15 holiday versions and four sampler display pieces. All free, with print profiles ready to go.

— THE JOINT

Three features that do the work



① Stacked swept-socket joints

Each segment carries a pin that prints inside the next segment's socket. The socket is swept around the pin so the toy can lean a full 22 degrees per joint without the post hitting a wall.

② Ball-joint arms that print standing up

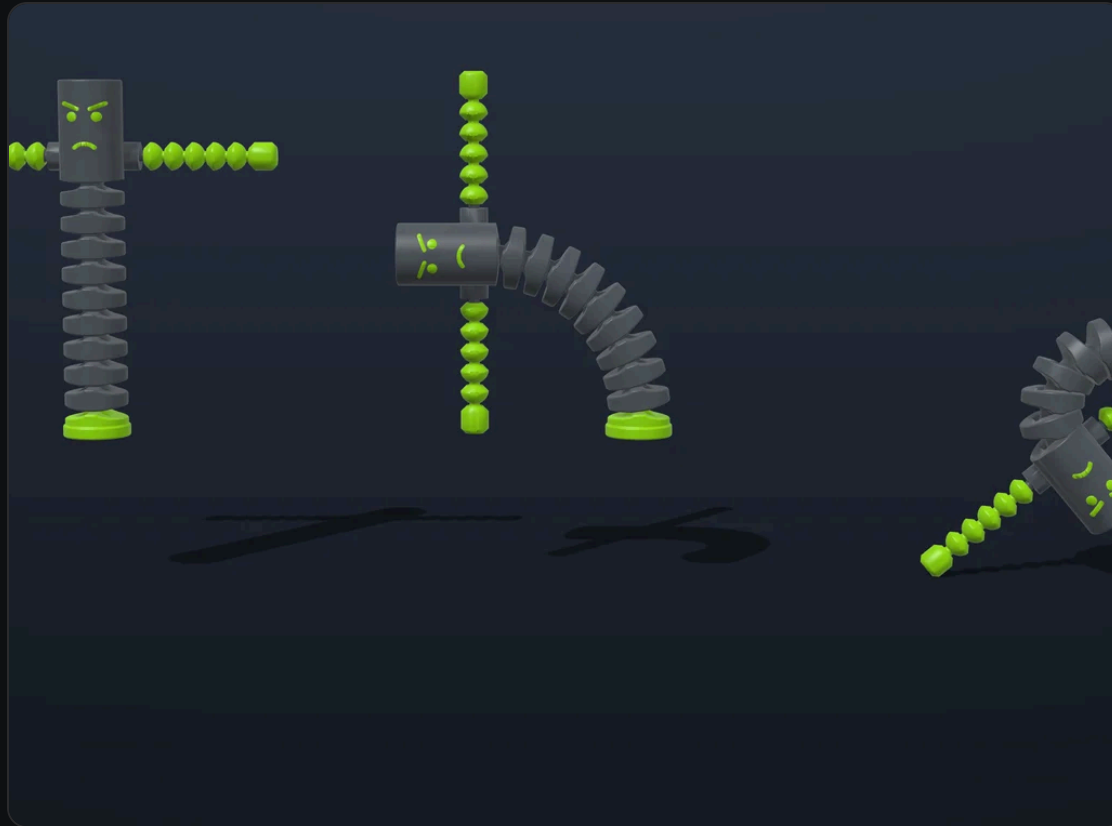
Each arm link is a ball in a socket with a 50 degree mouth. The first version had only 62 mm² of arm touching the bed. A flat foot on every link took that to 521 mm² with no loss of swing.

③ The face is a separate body

Faces, hat trim and accents are their own part in the file. On a dual-nozzle printer the whole toy prints in two colors with no filament swaps. Single nozzle gets a filament change at one layer.

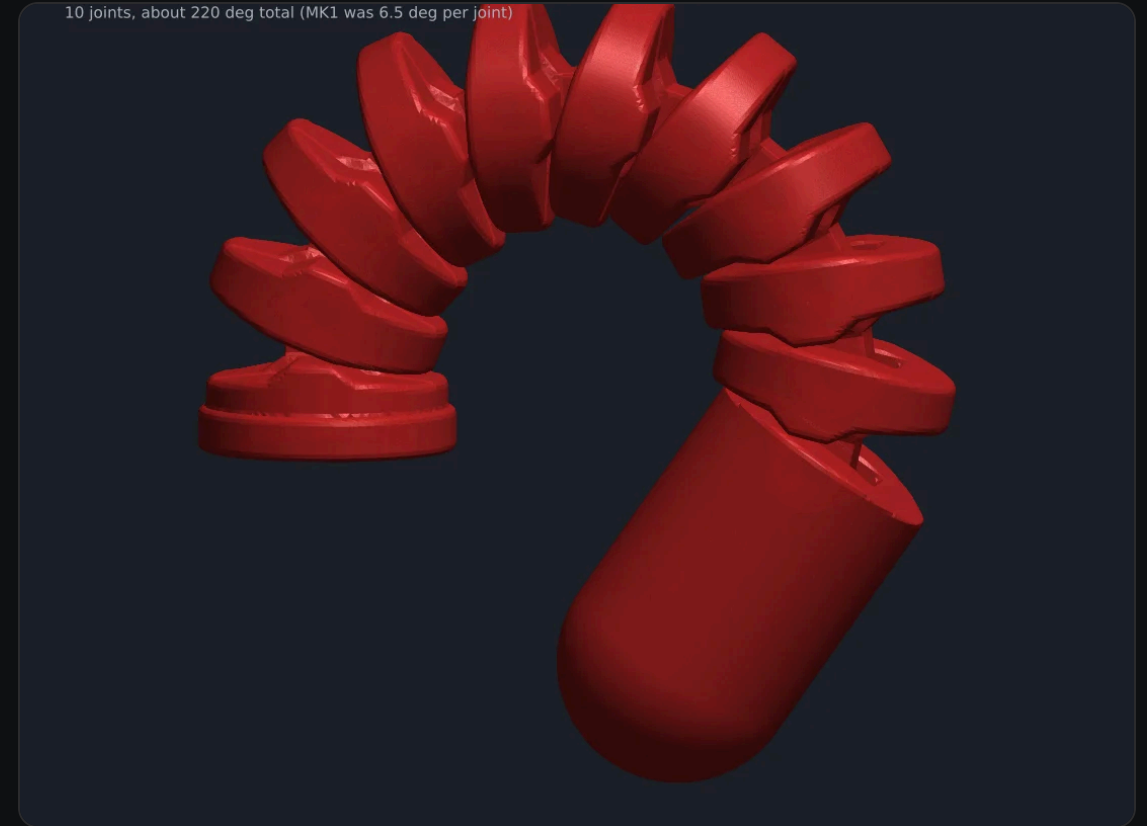
— ARTICULATION

About 220 degrees of lean, straight off the bed



Straight, a lean and a full curl

Ten joints at about 22 degrees each. 3D render.



The body at the stops

The swing was measured on the mesh, not estimated. 3D render.

— ONE BODY, 85 TOYS

Faces, textures, structures and seasons



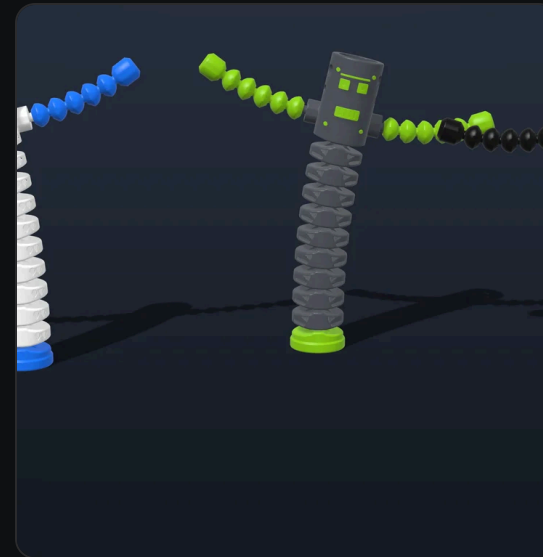
Face kits and characters

The face is a separate body, so it prints in its own color.



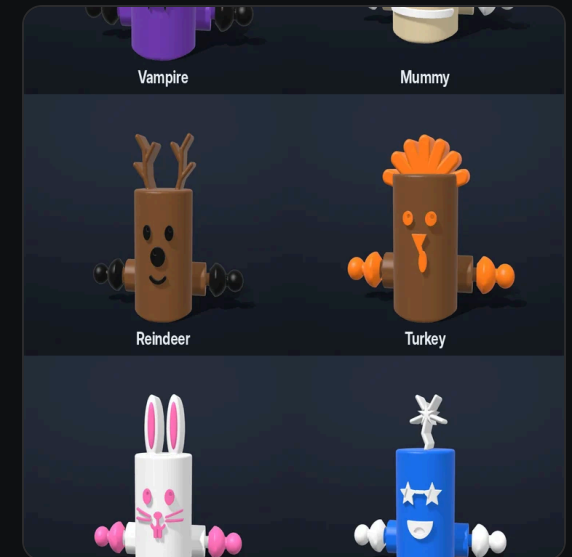
21 textures

Cut into the segments as height fields. Yes, one is a pickle.



Lattice and topo

Curved struts and hollow heads, stop faces left solid.



15 holiday toys

Halloween to the Fourth of July, still two colors.

All images are 3D renders. Real print photos replace them as the test prints finish.

— PRINT IT

Flat on its back, no supports, add a magnet



Print notes

Size	170 mm tall, about 174 mm across the arms
Material	PLA for the desk, PETG or ASA outside
Supports	None. No brim either
Magnet	20 mm disc glued into the base

Flex every joint once after printing to break the skin. Then it moves for good.

— PROCESS

How 85 toys came out of one model

01

Parametric body

One Inventor body with named parameters for segment count, joint clearances, rim and post. The variants are inputs, not remodels.

02

Rule-driven builds

An iLogic builder reads a recipe file and writes the part, STEP and STL for each toy. Three Inventor sessions built a batch of 12 in about six minutes.

03

Mesh checks

Every STL checked for closed shells, non-manifold edges, floating parts and volume against the CAD before it went in a print file.

04

Textures as math

Groove and relief skins are height fields cut 0.6 mm into the segments, so a texture can never reach a joint or change the swing.

05

Rendered, then photographed

A WebGL renderer in headless Chromium turned out the gallery in nine colorways. Real print photos replace the renders as the test prints finish.

06

Packaged for MakerWorld

18 sliced profiles, one toy per plate, a print and play guide, and a license that keeps the files free but not for resale.



— YOUR PRODUCT

What this means for your project

Print-in-place and moving parts

Hinges, snaps, ball joints and captive pins all come down to a few tenths of a millimeter and the right orientation. I design them for the printer you have and check the mesh before it ships.

Branded giveaways and product families

Your logo, your colors, your mascot. A rule-driven CAD model turns a family of variants into a list of inputs, with print files and renders that come out of the same pipeline.

Want a toy, a giveaway or a product family of your own?

kindofabigdill.com/quote



READ THE CASE STUDY

Tell me what it needs to do and who it is for. I reply within 2 business days.