Karsyz Dice Tower DIY Project

Thank You for Buying our Project Kit!

Hey there, DIY superstar! Thank you for picking up one of our project kits—we're so excited you're here! You're about to dive into a hands-on adventure that's all about creating something amazing from scratch. Whether you're a total beginner or a seasoned builder, this kit is your ticket to a good time and some serious skills.

With this kit, you'll be crafting something unique and awesome—think of it as your own little masterpiece! It's not just about the finished product (though you'll be proud to show it off). The real magic happens along the way as you learn cool new things, like how to connect pieces, solve challenges, and bring your ideas to life. Every moment is a chance to discover, experiment, and grow— all while having a blast.

So, grab your tools, find a cozy spot, and let's get building—you're in for an unforgettable, rewarding ride!

Overview

A dice tower adds a dash of controlled chaos to your dice rolls. Drop your dice into the top, and watch them tumble out the bottom onto the base—perfectly randomized, every time.

There's an optional metal fabrication component that lowers the center of mass making the tower more tip-over proof.

DIY Skill Level

'I know a few things already'

Processes

- 3D Printing
- Metal Fabrication: Cutting, grinding, drilling, countersink, deburring
- Sanding and painting of the tower and the steel mass (to prevent rusting)

Approximate Completion Times

- Printing: 18 hours
- Metal Fabrication: 30mins
- Sanding and Painting (tower): Get comfortable, sanding takes a while
- Sanding and Painting (steel mass): 10 mins

Parts List

1 – Tower - PLA approx. 440g
https://amzn.to/4l6bQXb

1 - Steel Mass Grade 1018 - 3" [76.2mm] x ¼" [6.35mm] Cold Rolled Flat Bar x 4"[101.6mm] long
Try to source locally if you can, this is a very common stock size
Metal Supermarkets

2 - #8 x 5/8" [M4 x 16] Flat Head Square Drive steel Wood Screws
https://amzn.to/41Oorqs

4 – 3/8" [10mm] Rubber Feet
https://amzn.to/3FITECO

1 – High Gloss Anti Rust Paint (black)
https://amzn.to/423hVLg

1 – Primer
https://amzn.to/428ZNQ4

Required Tools

3D Printing

3D Printer with a print volume of 8" x 8" x 12" (200mm x 200mm x 300mm)
https://amzn.to/4hKhPhj

Deburring Tool
https://amzn.to/4l7yWwB

Needle Nose Pliers + Side cutters / Flush cutters
https://amzn.to/4j5HMsL

Metal Fabrication

Metal File Set (optional)
https://amzn.to/3FK2noh

Grinder + Cut-off disc + flap disk (80 grit)
https://amzn.to/3XAal9F

Drill + drill bit: Ø11/64" [4.5mm]
https://amzn.to/3DWLTbP

Countersink bit + Center punch
https://amzn.to/3QQCNQT

Random Orbit Sander (nice to have)
https://amzn.to/42wgBB1

5" 8-Hole Hook and Loop Sanding Discs 40-320 grits1 (nice to have)
https://amzn.to/3QPLcnA

Workspace Nice-To-Haves

Work bench + Vice or Sawhorse + Clamp

Painting

Sandpaper + Sanding block (Optional)
https://amzn.to/3DUwd92

Some of the links are Affiliate links where I get a small commission when you purchase at no additional cost to you.

3D Printing Safety

Do:

- Use your printer in a well-ventilated room, especially with ABS or resin.
- Keep your printer on a sturdy, fire-resistant surface.
- Let the printer cool down before touching the nozzle or heated bed.
- Wear gloves when handling liquid resin to avoid skin contact.
- Use safety glasses when cutting or sanding prints.

Don't:

- Don't leave your printer running unattended for long periods.
- Don't touch the hot nozzle or heated bed while printing.
- Don't inhale fumes from melting plastic—use ventilation!
- Don't use cheap extension cords or overload power outlets.

Instructions – 3D Printing

Successfully slicing and printing a 3D model involves several steps. While 3D printing has a lot of nuances to master, the following instructions will get you started on the right path. If you need more detail on any step or run into trouble, you can search YouTube for explainer videos or ask an AI for an in-depth breakdown. Feel free to post questions in the [Karsyz Discord](#) 'Help Desk' channels too—I'll do my best to assist you there!

1. **Set Up Your 3D Printer**

   - Ensure your 3D printer is powered on, the bed is leveled, and it's in good working condition.
   - Load the appropriate filament you would like to use(e.g., PLA, ABS, PETG) matching the model's requirements.
   - Clean and prepare the print bed (e.g., with tape, glue, or heat if needed).

2. **Install and Open Slicing Software**

   - Use a slicer program compatible with your printer (e.g., Cura, PrusaSlicer, or Simplify3D).
   - Open the software and import the provided STL file by dragging it in or selecting "Import."

3. **Configure Print Settings**

   - Choose your printer model in the slicer if prompted.
   - Adjust these settings:
     - Layer Height: 0.1–0.3 mm (lower for detail, higher for speed).

- Infill: 10–20% for lightweight prints, 50–100% for strength.
    - Supports: Enable if the model has overhangs steeper than 45°.
    - Bed Adhesion: Add a brim or raft if needed for stability if desired.
    - Temperature: Set nozzle and bed temperatures for your filament (e.g., PLA: 190–220°C nozzle, 50–60°C bed).
- Position the model on the virtual print bed, ensuring it fits the printer's build volume.

4. **Slice the Model**

- Click "Slice" or "Generate G-code" in the software.
- Check the preview for layer paths, supports, and estimated print time. Adjust settings if needed and re-slice.

5. **Export and Transfer the File**

- Save the G-code file (e.g., "model.gcode") to an SD card, USB drive, or send it directly to your printer if connected via Wi-Fi or USB.

6. **Start the Print**

- Load the G-code file into your printer via SD card/USB or software.
- Select the file from the printer's menu and begin printing.
- Watch the first layer to confirm good adhesion, tweaking bed leveling or flow if necessary.

7. **Monitor and Finish**

- Periodically check the print for issues like warping or filament jams.
- After completion, let the model cool before removing it from the bed.
- Remove any supports with pliers or a craft knife or deburr tool and clean up the model as needed.

8. **Troubleshooting Tips**

- If the print fails (e.g., poor adhesion, stringing), verify bed leveling, temperature, or filament condition.
- Consult your printer's manual or online resources for specific solutions.

Painting Safety

Do:

- Work outside or in a well-ventilated area—fumes can be toxic.

- Wear a mask or respirator when spray painting or using strong chemicals.

- Keep paint away from open flames or heat sources (many are flammable).

- Wear gloves and old clothes to protect your skin.

- Clean up spills immediately and dispose of used materials safely.

Don't:

- Don't spray paint indoors without proper ventilation.

- Don't use paint near sparks, fire, or electrical equipment.

- Don't wash paint-covered hands in the sink—use disposable wipes first.

- Don't store paint cans in hot places—they can explode!

Instructions – 3D Print Sanding and Painting

Sanding Preparation

1. **Gather Materials:**

   o Sandpaper (various grits: start with 120-150 grit for rough sanding, then 220-400 grit for smoothing, and 600-800 grit for finishing).

   o Sanding block or sponge (for flat surfaces or curves).

   o Dust mask and safety glasses (to protect against plastic dust).

   o Soft brush or compressed air (to remove dust).

2. **Inspect the Model:**

   o Examine the plastic model for visible layer lines, support marks, or imperfections from the 3D printing process. Identify areas that need more aggressive sanding.

3. **Clean the Surface:**

   o Wash the model with warm water and mild dish soap to remove oils, fingerprints, or release agents (common with resin prints). Use a soft brush for crevices.

   o Rinse thoroughly and let it air dry completely, or use a lint-free cloth to dry it.

4. **Secure the Model:**

o   Place the model on a stable, non-slip surface or hold it with a clamp or painter's pyramid to keep it steady while sanding. Avoid gripping too tightly to prevent damage.

5. **Start Rough Sanding:**

    o   Begin with 120-150 grit sandpaper to remove major layer lines, support remnants, or sharp edges. Sand lightly in a circular motion or along the grain of the print lines to avoid scratching.

    o   Wipe away dust frequently with a brush or compressed air to check progress.

6. **Progress to Smoother Grits:**

    o   Move to 220-400 grit sandpaper to smooth the surface further, focusing on evening out the roughness left from the initial sanding.

    o   Finish with 600-800 grit for a polished, paint-ready surface. Wet sanding (using water) at this stage can reduce dust and achieve an even finer finish.

7. **Final Cleaning:**

    o   After sanding, clean the model again with soap and water or wipe it with isopropyl alcohol (70-90%) to remove all dust and residue. Let it dry fully.

Painting Preparation

1. **Gather Materials:**

    o   Primer (plastic-compatible, e.g., automotive or model-specific primer).

    o   Paint (acrylics for hand-painting or spray paint designed for plastic).

    o   Masking tape (for protecting areas you don't want painted).

    o   Paintbrushes or an airbrush (if not using spray paint).

    o   A well-ventilated workspace and drop cloth.

2. **Check the Surface:**

    o   Ensure the sanded surface is smooth and free of scratches or dust. Run your finger lightly over it—any roughness means more sanding is needed.

3. **Apply Primer:**

    o   In a well-ventilated area, apply a thin, even coat of primer to the model. Hold spray cans 8-12 inches away and use sweeping motions to avoid drips.

    o   Let the primer dry fully (check the can for drying time, usually 15-30 minutes), then inspect for uneven spots. Sand lightly with 600 grit if needed and apply a second coat if coverage is thin.

4. **Mask Off Areas (Optional):**

- Use masking tape or liquid mask to cover sections of the model you don't want painted (e.g., for multi-color designs).

5. **Test Your Paint:**

- Before painting the model, test your paint on a scrap piece of plastic or a hidden area to ensure it adheres well and the color is what you expect.

6. **Final Setup:**

- Suspend the model (e.g., on a bent coat hanger or stand) to allow painting all sides without touching it. Ensure your workspace is dust-free and well-lit.

Metal Fabrication Safety

Do:

- Always wear safety glasses and gloves when working with metal.

- Use ear protection if cutting, grinding, or hammering metal.

- Clamp metal down before cutting or drilling to prevent slipping.

- Keep a fire extinguisher nearby—metalwork can create sparks.

- Check tools for damage before using them.

- Metal fabrication is dirty and should be done outside or in a controlled environment.

Don't:

- Don't wear loose clothing, jewelry, or anything that can get caught in machines.

- Don't touch metal right after cutting or welding—it stays hot!

- Don't grind or weld near flammable items like sawdust or cloth.

- Don't rush—take your time to set up properly before cutting or drilling.

Instructions - Metal Fabrication

1. **Prepare the Template:**

   o Print the provided template.

   o Verify that the template dimensions match the dimensions specified on the drawing using a ruler or caliper.

2. **Attach the Template:**

   o Secure the template to the steel using double-sided tape or a light adhesive paste, ensuring it is flat and aligned with the steel edges.

3. **Mark Hole Locations:**

   o Use a center punch to mark the locations of all holes as indicated on the template. Ensure the punch marks are clear and precise.

4. **Cut the Steel:**

   o Use a workbench vice or a sawhorse and a c-clamp to hold the steel firmly in place.

   o If the steel needs to be cut to length, use a cutoff disk to trim it according to the drawing specifications.

   o Use the cutoff disk and grinder to rough-cut most of the rounded corners, leaving some material for final shaping.

5. **Shape the Edges:**

   o   Use a flap disc and grinder to refine the rounded edges and corners, following the template lines closely for accuracy.

6. **Drill the Holes:**

   o   Drill a 1/8" pilot hole at each marked location.

   o   Enlarge each hole to the size specified on the drawing using the appropriate drill bit.

7. **Countersink the Holes:**

   o   Countersink the holes on one side of the plate to match the screws you have. Test with a screw to ensure it sits flush or slightly below the surface of the plate.

8. **Deburr the Edges:**

   o   Remove all burrs and sharp edges from the drilled holes and cut edges using a deburring tool or file.

9. **Prepare for Painting:**

   o   If the template was glued, use a grinder to remove any remaining adhesive.

   o   Grind off the steel mill scale, rust, or surface imperfections.

   o   Use a sanding block with 80-grit sandpaper to smooth the steel, progressing to 220-grit for a paint-ready finish.

   o   Wash the steel with soap and water, or use a solvent like brake cleaner or paint thinner to remove grease and debris.

   o   Allow the steel to fully dry. Optionally, use a heat gun to warm the steel slightly (ensure it's not cold to the touch).

10. **Paint the Steel:**

   o   Bend a coat hanger or other piece of wire into a hook and hang the part.

   o   Apply paint evenly to all surfaces, ensuring full coverage. Let dry according to the paint manufacturer's instructions.

   o   Let the paint fully dry.

Instructions - Project Assembly

Now that you have your parts made, lets put it all together.

Inspect the Parts

- Check the tower for any damage or rough spots.

- Confirm the paint is fully dry and evenly applied.

- Ensure the metal plate's holes line up with the base.

- Verify the adhesive rubber feet and #8x5/8" screws are all present and correct.

Attach the Metal Plate

- Take the #8x5/8" screws from your parts list.

- Align the metal plate's holes with the tower's base.

- Screw them in gently with a screwdriver until they're seated and snug.

- Avoid overtightening, as the plastic can strip if you're not careful.

Install the Rubber Feet

- Peel off the backing from each adhesive rubber foot.

- Press them firmly into place on the bottom of the tower.

- Ensure they're evenly spaced for stability.

Test the Tower

- Flip the tower over to stand it upright.

- Drop a few dice through the top.

- Watch them roll out to confirm your tower's ready to use!

Summary

Congratulations! You've made it to the end of the project! If this was your first time through a build like this, you've picked up some impressive skills—3D printing, metal fabrication, sanding, and painting. Well done! Ready to roll the dice on your next project? How about designing a custom dice tray to match your new tower? Check out that project and others at https://karsyzrobotics.com.