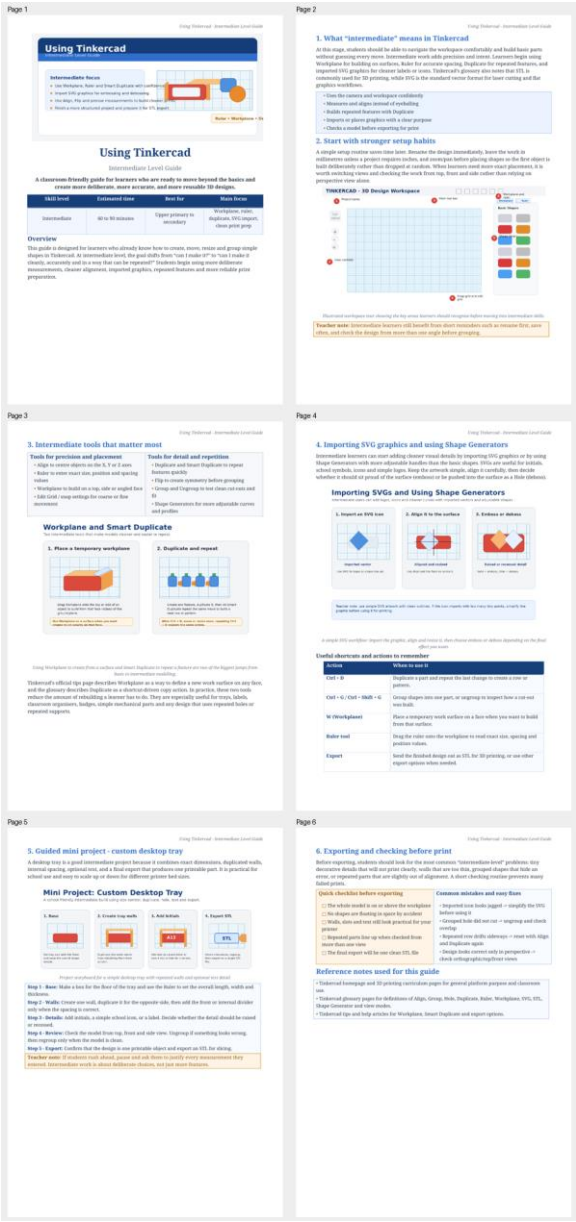


MAXXESHOP3D

Using Tinkercad

Advanced Level Guide



Designed for students and educators ready to move beyond simple shapes and begin using advanced layout, patterning, embossing, print tolerances and project planning techniques inside Tinkercad.

Skill level	Recommended project type	Best suited to
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Advanced

Containers, fixtures, organisers, embossed designs

Students already confident with align, group, hole and sizing

1. What “Advanced” Means in Tinkercad

At advanced level, Tinkercad becomes less about making a single object from simple primitives and more about building a repeatable, accurate design workflow. You begin planning parts in stages, controlling clearances, building on surfaces with the Workplane tool, using Smart Duplicate to create patterns, and importing SVG artwork to emboss or deboss finished parts.

This guide assumes you already know how to move shapes, resize them, align them and group solids with holes. The focus here is on designing parts that look cleaner, print more reliably and are easier to revise.

Learning goal: Design a tidy desk tray or organiser with repeated compartments, embossed graphics and print-ready wall thickness, while using advanced Tinkercad tools deliberately.

2. Key Advanced Tools and Ideas

Tool or concept	Why it matters
Workplane on a surface	Lets you place and size shapes directly on sloped or raised faces instead of guessing from the main floor grid.
Smart Duplicate	Repeats the last move, resize or rotation step so you can build evenly spaced patterns quickly.
Snap Grid	Allows rough moves at large increments or precise edits at small increments such as 0.1 mm.
SVG import	Brings vector logos, icons or labels into the design for embossing or debossing.
Tolerance and clearance	Makes moving lids, slots and fitted parts more likely to work after printing.
Model in stages	Build the outer body first, then internal cut-outs, then labels and finishing details.

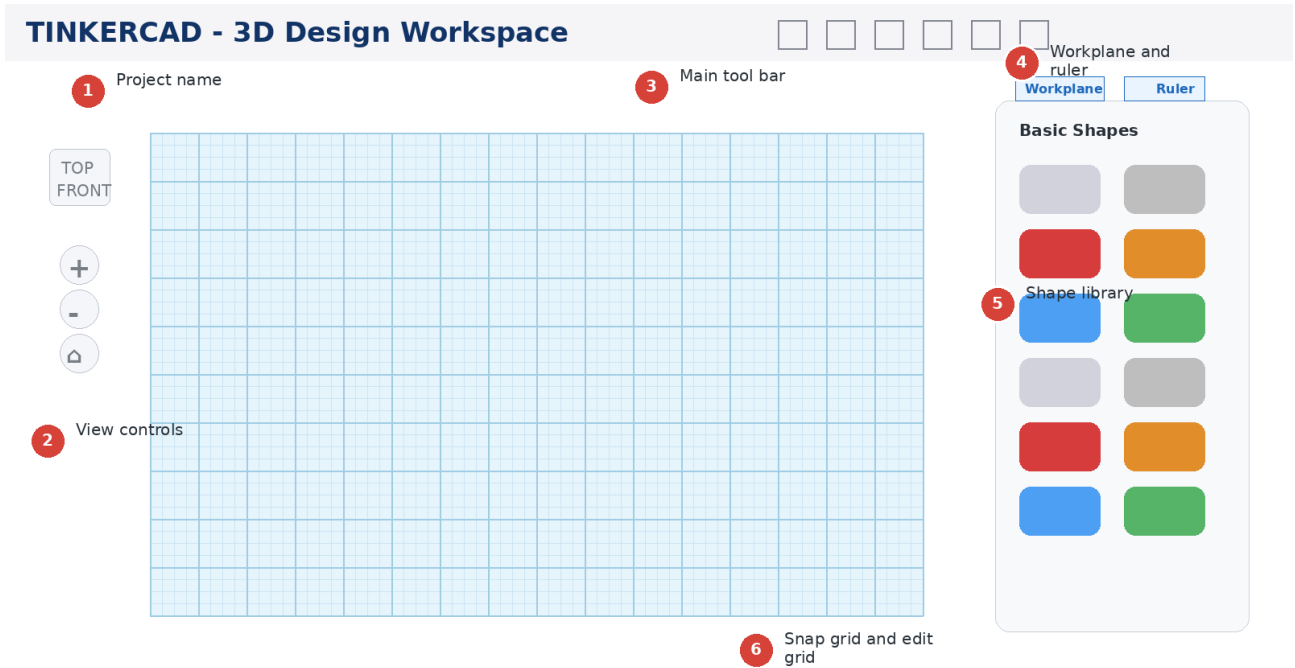


Figure 1. Tinkercad workspace overview – a useful reminder before moving into advanced layout and measurement work.

3. Advanced Workflow for Better Models

- Start with the outside size first. Set the total length, width and height of the part before cutting interior features.
- Keep one version as a 'master' copy before heavy grouping. Duplicate it and continue working on the copy so you can go back if needed.
- Use named stages in your own process: base body, cut-outs, patterning, labels, final export.
- When using holes, make them taller than the solid they are cutting through so the subtraction is complete and easy to check.
- Reduce the snap grid when finishing details, but use a larger snap grid early so you do not waste time on tiny nudges.

Common mistake: Students often start by decorating too early. On advanced projects, structure and fit should be solved first; surface detail comes later.

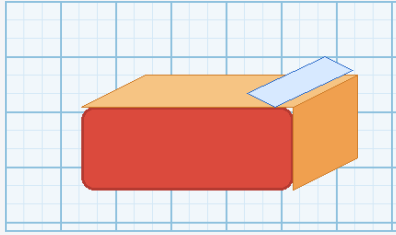
4. Using Workplane + Smart Duplicate Together

These two tools are powerful when used together. Place the Workplane on the face where the feature belongs, add the first rib, divider or recess, then use Duplicate and Smart Duplicate to repeat the feature with equal spacing. This is much faster and more accurate than dragging each copy into place by eye.

Workplane and Smart Duplicate

Two intermediate tools that make models cleaner and easier to repeat.

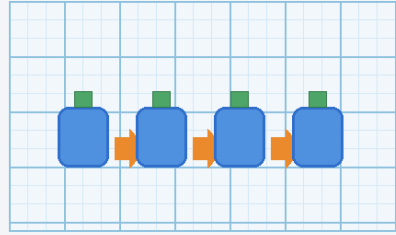
1. Place a temporary workplane



Drag Workplane onto the top or side of an object to build from that face instead of the ground plane.

Use Workplane on a surface when you want shapes to sit ex

2. Duplicate and repeat



Create one feature, duplicate it, then let Smart Duplicate repeat the same move to build a neat row or pattern.

After Ctrl + D, move or resize once; repeating Ctrl + D repe

Figure 2. Use Workplane to target the correct surface, then Smart Duplicate to build repeating geometry.

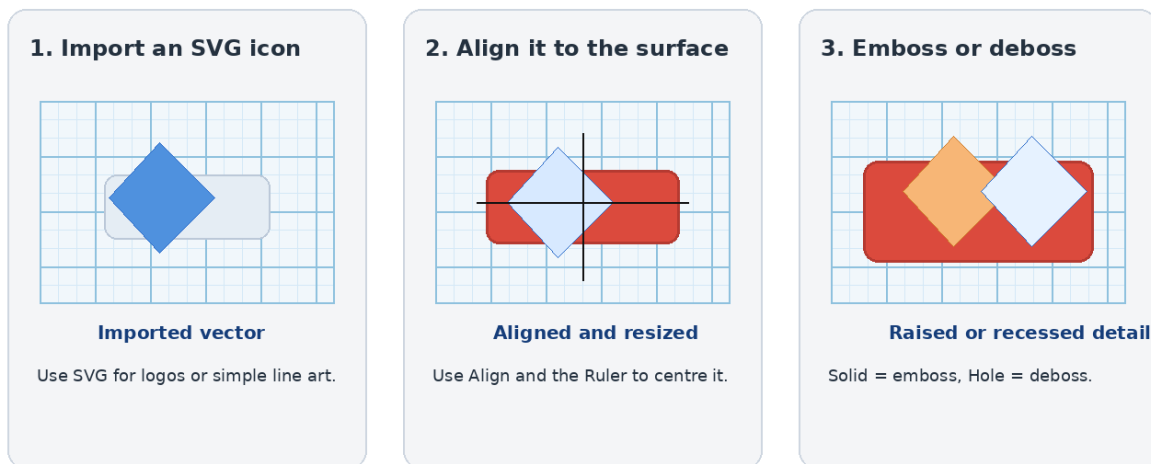
5. Embossing, Debossing and SVG Imports

Advanced Tinkercad projects often need names, icons or visual guidance. Importing an SVG lets you turn simple vector artwork into a 3D feature. If the SVG remains a solid and is grouped with the part, it becomes an emboss. If the SVG is changed to a hole and slightly sunk into the surface, it becomes a deboss.

- Choose simple SVG artwork with clean outlines. Fine details may not print well at small size.
- Scale the SVG carefully and align it before grouping.
- Use shallow emboss or deboss depths first. Around 0.6–1.2 mm is often easier to print cleanly than very deep details.
- Always preview the grouped result to make sure letters and enclosed spaces have not collapsed.

Importing SVGs and Using Shape Generators

Intermediate users can add logos, icons and cleaner curves with imported vectors and adjustable shapes.



Teacher note: use simple SVG artwork with clean outlines. If the icon imports with too many tiny points, simplify the gr

Figure 3. Embossing and debossing with imported SVG artwork adds identification and polish to finished parts.

6. Designing for 3D Printing Success

Check	Advanced print-ready advice
Wall thickness	Avoid overly thin walls on containers and trays. Stronger walls and floor thickness improve classroom print success.
Clearances	If one part needs to fit inside another, leave a small gap rather than modelling both at exactly the same size.
Bridging and overhangs	Ask whether decorative details create hard-to-print overhangs. Simplify where needed.
Orientation	Rotate the model before export if a different face on the bed will reduce supports or improve strength.
Pattern repeats	Check that repeated features have enough spacing so the print does not merge into one mass.

Final export

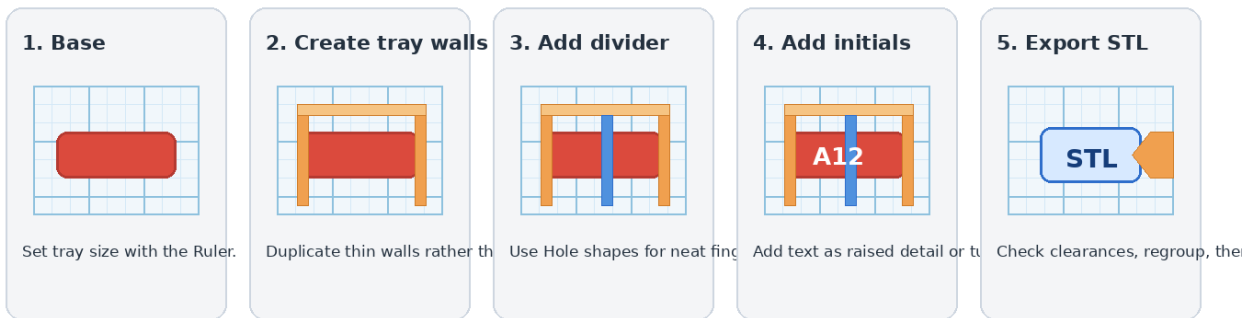
Export the latest grouped version to STL after checking there are no hidden spare shapes left nearby.

7. Advanced Practice Project – Modular Desk Tray

This project uses advanced Tinkercad methods to build a print-ready organiser tray with repeated compartments and a front label panel. It is an excellent stepping-stone from intermediate work into more thoughtful design planning.

Mini Project: Custom Desktop Tray

A school-friendly intermediate build using size control, duplicate, hole, text and export.



Intermediate quality check

- Walls are thick enough for school printers
- No floating parts remain after grouping
- Text or icons are large enough to print cleanly
- Tray fits the printer bed and exports as one STL

Figure 4. Example advanced tray project combining outer sizing, internal cut-outs, repetition and surface detail.

1. Create the tray body as one large box and set the exact outer size.
2. Duplicate the box, convert the duplicate to a hole and shrink it to form the inner cavity. Raise the floor thickness by leaving material underneath.
3. Create one divider or one internal recess on the correct surface using Workplane.
4. Use Duplicate and Smart Duplicate to repeat the divider pattern at equal spacing.
5. Add a front panel or recess for a label. Import an SVG or text feature and emboss/deboss it carefully.
6. Check wall thickness, corner strength and spacing before the final group.
7. Export to STL and review the slicer preview to confirm the tray is solid and printable.

Teacher extension: Ask students to create two tray versions: one optimised for fastest printing and another optimised for visual presentation. Comparing both encourages thoughtful engineering trade-offs.

8. Troubleshooting Advanced Builds

Problem	Likely fix
Grouped result looks wrong	Undo and check whether a hole was left as a solid, or whether a part was not aligned before grouping.
Pattern spacing is inconsistent	Delete the uneven copies, create one correct move, then use Smart Duplicate again from the first good copy.
Imported logo is messy	Simplify the SVG artwork before import or use larger, bolder shapes.
Text or icons disappear after grouping	The feature may be too shallow, too thin or buried inside the solid.
Model prints weakly	Increase floor or wall thickness and reduce fragile decorative cut-outs.
Parts do not fit together	Add clearance and test a small section before printing the full design.

9. What to Practise Next

- Build the same object twice: once quickly, then again with better measurement and cleaner patterning.
- Design a set of matching parts that share the same spacing, wall thickness and label style.
- Experiment with embossing versus debossing and compare which reads better after printing.
- Review your export in a slicer and compare the digital plan with the way the part will actually be printed.

10. Final Advice

Advanced Tinkercad work is not about making the most complicated model possible. It is about using a deliberate process so your design is accurate, repeatable and ready to print. If your model is easy to edit, clearly laid out and prints successfully, you are using Tinkercad at an advanced level.

As you improve, keep asking three questions: Is it aligned? Is it repeatable? Will it print reliably? Those questions turn a good-looking model into a well-designed one.