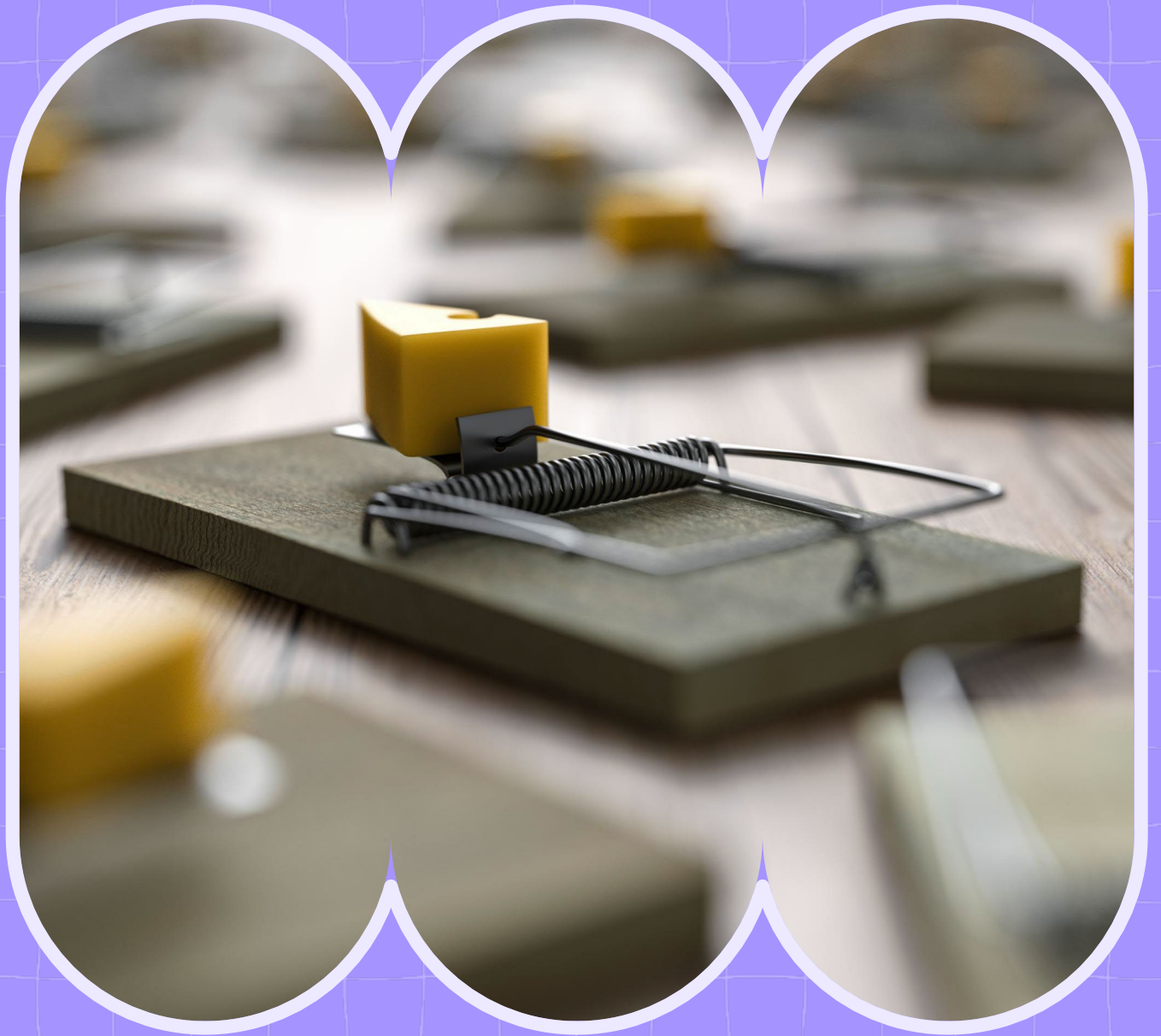


TINKERCAD KEYCHAIN WORKSHOP

Learn to create custom 3D
keychain designs easily





Introduction to the Keychain Project



Tinkercad Keychain Project Overview



Beginner-Friendly 3D Design

The project offers a simple introduction to 3D modeling, ideal for beginners and classroom teachers exploring spatial thinking.

Hands-On Learning Approach

Creating a personalized keychain provides a tangible result, motivating learners through practical design challenges.

Foundational 3D Skills

Participants learn to use tools like resizing, alignment, and grouping, building essential 3D modeling skills.

Spatial Reasoning Development

The activity fosters spatial thinking by encouraging visualization of designs in three dimensions and physical form.



Starting a New Design



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Participants navigate the platform and open a new blank design workspace for 3D modeling.

Renaming projects encourages organization and good digital workflow habits, especially in classrooms.

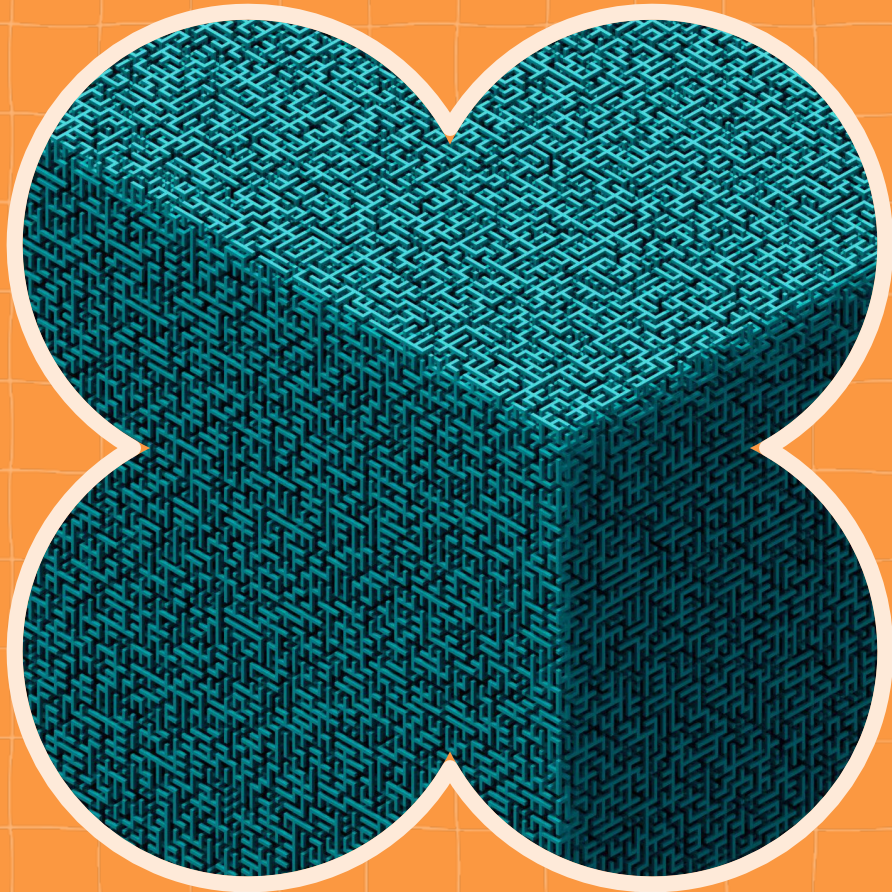
Users learn to rotate views and zoom to explore their design from multiple perspectives effectively.



BUILDING THE BASE SHAPE



Step 2: Create the Base



Using Primitive Shapes

Participants start by placing a box shape, learning about primitive shapes as foundational design elements.

Adjusting Dimensions Precisely

Learners adjust box dimensions to specified measurements, reinforcing precision and measurement skills.

Understanding the Z-Axis

The height dimension introduces the Z-axis concept, different from length and width on the XY plane.

Building a Reference Base

The base acts as a reference point for future additions, aiding spatial reasoning and design assembly.

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Refining the Shape

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Step 3: Round Corners



Customizing Shape Appearance

Adjusting the radius softens box edges, transforming sharp rectangles into smooth, polished shapes.

Enhancing Curve Smoothness

Increasing the number of steps enhances curve smoothness, demonstrating the effect of digital resolution.

Design and Safety Benefits

Rounding edges improves appearance and safety, linking digital design to real-world object functionality.

Encouraging Experimentation

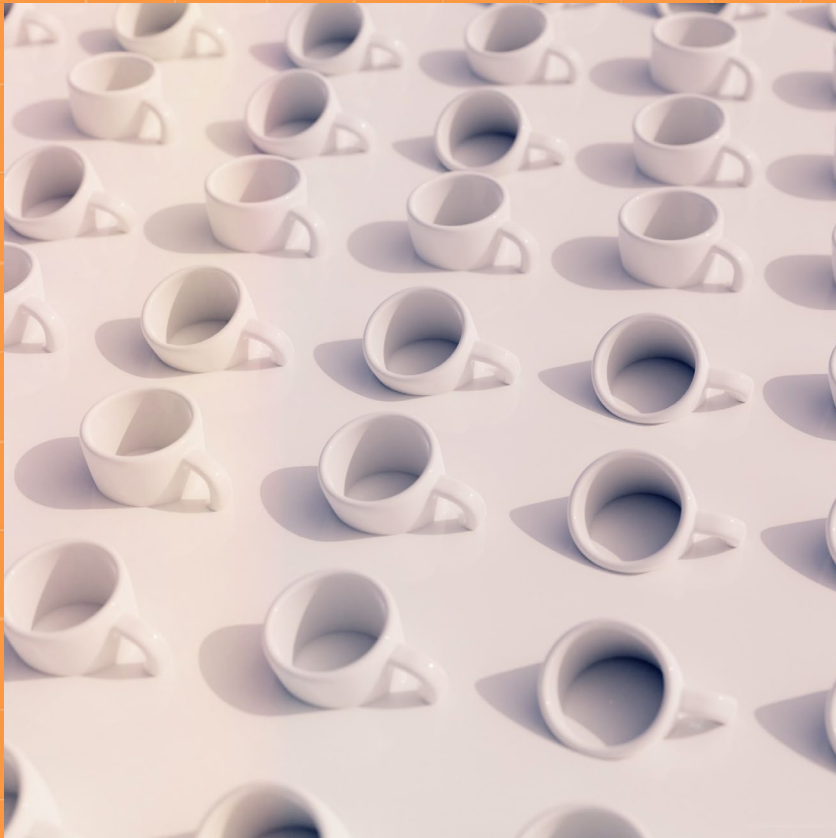
Users can vary radius values to observe changes, fostering creativity and spatial understanding.

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Creating Functional Features

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Step 4: Add Keyring Hole



- Creating Hole with Cylinder
 - Drag a cylinder shape and convert it into a hole to introduce subtractive design concepts in 3D modeling.
- Precise Alignment
 - Resize and align the hole precisely near the base edge using the align tool to ensure accurate placement.
- Grouping Shapes Permanently
 - Group the hole with the base to permanently cut material and alter the object's geometry.
- Spatial Reasoning Application
 - Apply spatial reasoning to position and anticipate how alignment affects the final 3D printed structure.

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Adding Personalization

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Step 5: Add Text

Personalization Through Text

Adding text allows users to create unique, meaningful keychains personalized with names or chosen words.

Spatial Planning and Scaling

Users adjust text size and proportions to fit the base, reinforcing spatial planning and legibility.

3D Layering and Engraving

Modifying text height demonstrates layering in three dimensions with options for raised or engraved text.

Creative and Technical Skills

This step encourages experimentation with fonts and sizes while maintaining alignment and functional design.

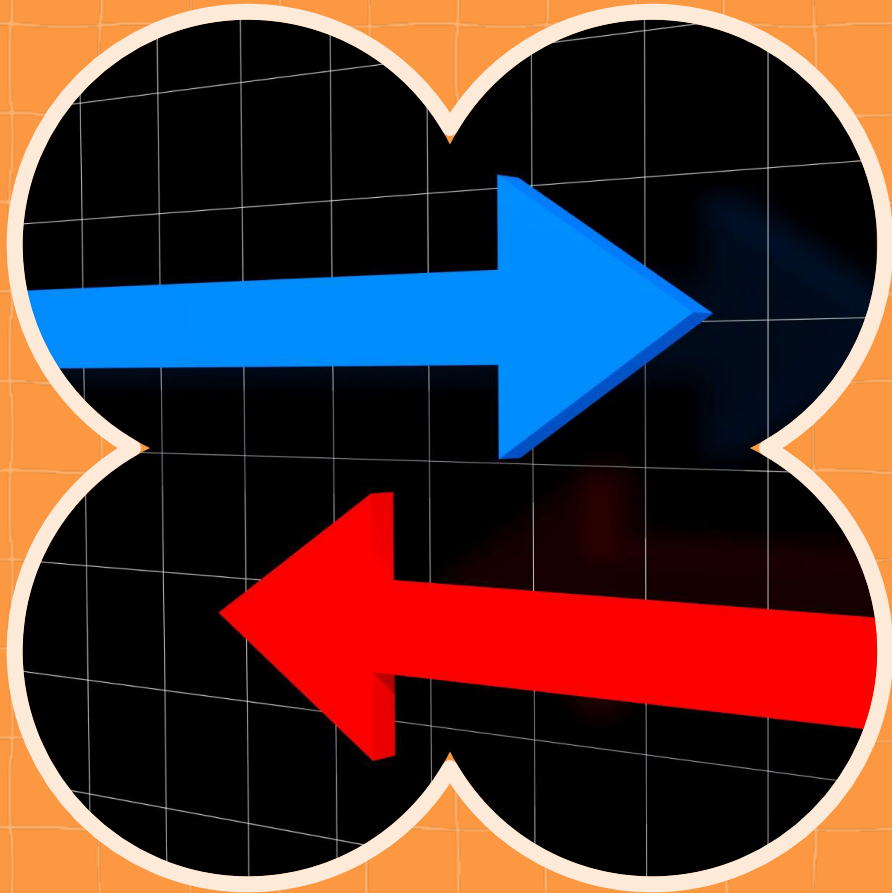




POSITIONING ELEMENTS



Step 6: Align Text



Using the Align Tool

The align tool positions text precisely on the base, centering it horizontally and vertically for balanced layout.

Spatial Relationship Understanding

Aligning text improves comprehension of object positioning and spatial relationships in 3D environments.

Symmetry and Visual Organization

This step reinforces design principles of symmetry and organization for visually appealing models.

Verification from Multiple Perspectives

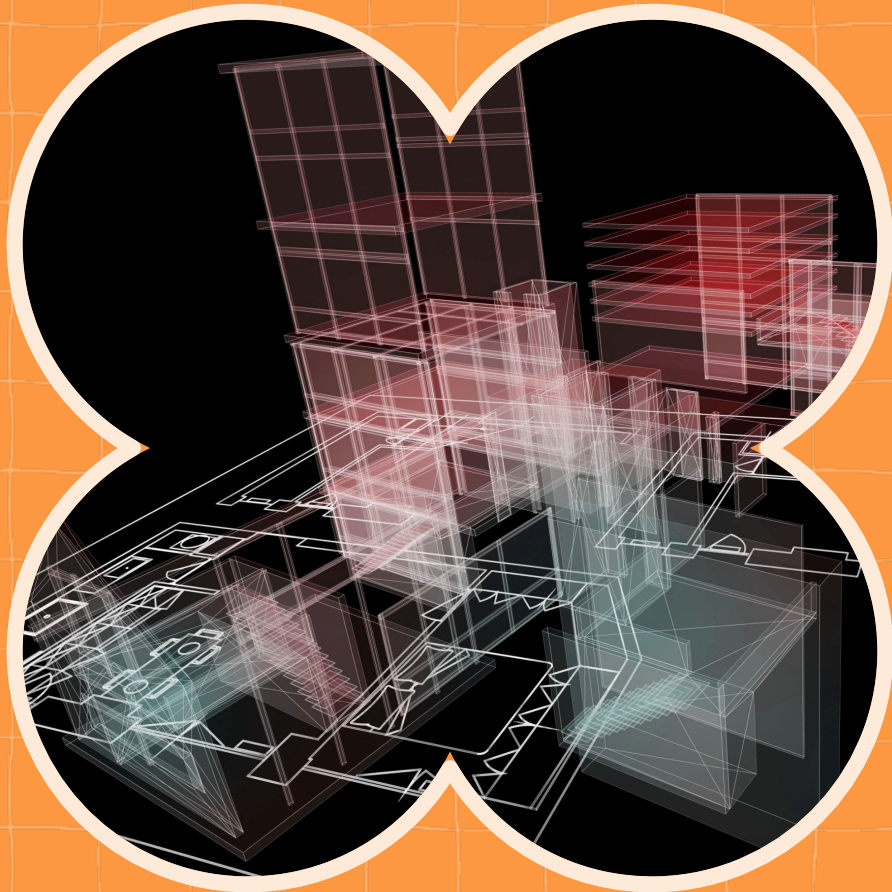
Rotating the view confirms text is positioned correctly without floating or embedding errors.



COMPLETING THE DESIGN



Step 7: Final Design



Grouping Components

Grouping merges multiple design elements into a single cohesive object essential for export or 3D printing.

Design Review

Review design carefully for thickness, alignment, and placement to ensure production readiness.

Iterative Improvement

Design iteration allows adjustments before final grouping, improving functionality and appearance.

Spatial Understanding

Combining multiple objects enhances spatial thinking and understanding of object interactions in space.

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Extending the Activity

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