



Tangram Puzzle

Topic Area:
Math (Geometry)

Duration:
40-60 minutes

Difficulty Level:
Intermediate

Materials:

- Device with Cricut Design Space Installed
- Cricut Maker 3
- Deep-point blade or knife blade
- StrongGrip mat
- Brayer
- Masking tape
- Paint
- Paintbrush
- Chipboard 2.0mm
- Scrap paper
- Ruler
- Pencil

Planning the Tangram:

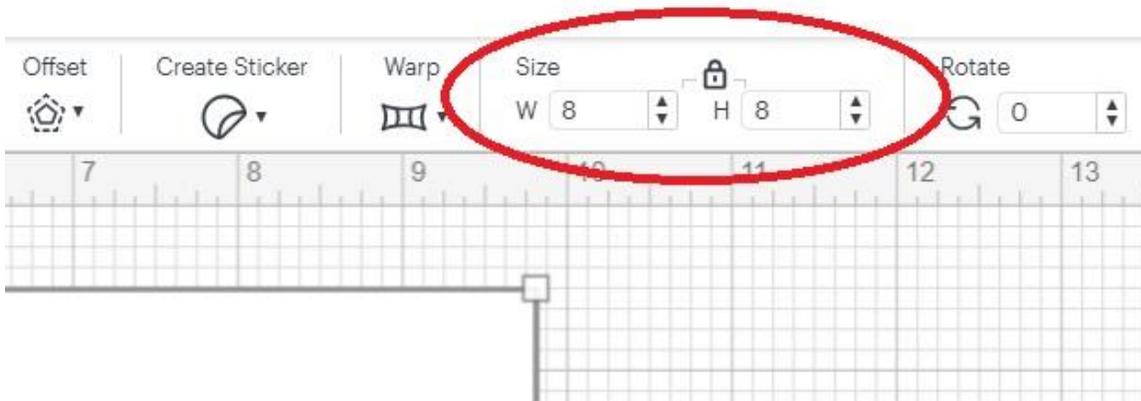
1. Determine the dimensions of the overall square that the tangram puzzle will be.
2. Calculate the diagonal of the square. This will be important as you design and plan out your puzzle. The formula for calculating the diagonal of a square is $d = a\sqrt{2}$. In this equation, a represents the side of the square and d represents the diagonal of the square. Use this to ensure the correct size and placement of the diagonal throughout the process.
3. A tangram puzzle consists of 5 triangles (two small, one medium, and two large), a square, and a parallelogram.



4. Draw out several different solutions to the tangram puzzle to test and see which one would work best. Use a ruler, so that you know exactly what size each shape should be.
5. When you have a design you like, it's time to head over to your Cricut Design space and bring the idea to life!

Designing the Tangram:

1. Begin with a blank canvas in Cricut Design Space
2. Under images, select and add the square (with the straight not rounded edges).
3. On the top menu bar, where it says size, click the lock image to unlock the dimensions. Since this will be creating a square, ensure that the width and height are the same. When you have inputted the dimensions, click the lock icon again.



4. Change the shape to white and ensure that the the operation type is set to “basic cut”
5. Add a diagonal scoring line across the square to set up the space for the two large triangles. Change the operation from scoring to “basic cut.” Ensure that dimensions of the line reflect the size of the diagonal calculated during the planning process.
6. Repeat the same process by adding lines to create all of the shapes. Use your measurements from the planning process to help you estimate the size of the line needed.
7. To help you ensure that the lines are placed correctly for a proper cut, zoom in as much as possible to get the closest fit, whenever necessary.



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8. Once you have created all the puzzle pieces, select all of the shapes. Right click and select attach. You can also do this from the layers bar. This will ensure that all of the lines are arranged and cut correctly when you go to make it.



Cutting Your Design

1. Once the design has been finalized, select “Make” and confirm that the design will be created on the mat.
2. Select the number of project copies you will need.



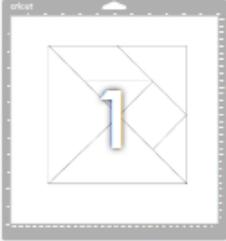
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3. Verify that your design will cut one project. You should see your design on one mat with the operation “basic cut”

Project copies: 

[Apply](#)



Basic Cut

Material Load Type



Material Size



Mirror 

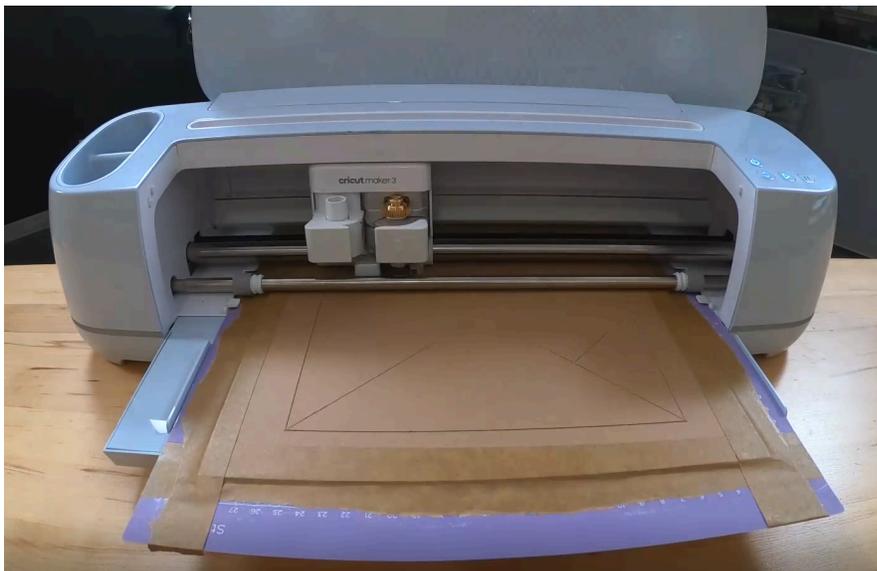
4. Move the design to the center of the mat.
5. Gather your StrongGrip mats, chipboard, tape, and brayer.
6. Place the chipboard on the center of the mat. Roll the brayer over the chipboard to firmly adhere it to the mat. Then, take the masking tape and secure all 4 edges of the chipboard to the mat. Don't make the tape cover too much of the board so it is not covering the area where the blade will be cutting.
7. When materials are ready to go and all details have been confirmed, click “Continue.”



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8. Select the material type. You will need to search for “chipboard 2.0mm” and select it. Ensure that you are selecting the correct material type and thickness size, as erroneously doing so can cause damage to your machine.
9. As instructed by the on-screen prompts, carefully move the star wheels all the way to both sides. This will help the mat move seamlessly through the machine and not alter the look of your material. Then insert the knife blade and proceed according to the on screen prompts.
10. Place the mat with the chipboard material onto the machine, within the material guides, and press the flashing load/unload button. The machine will take up the material and measure the mat length.
11. After the scanning process is complete, the go button will flash. Press the go button. The machine will first scan the material and detect the correct blade. Once the scanning and detection process is complete, the blade will begin making the cuts. Please note, this process will take a longer than average time to complete as the machine is making numerous passes of the cut to ensure the pieces cut all the way through. In order to conserve time and materials, it is recommended to do a test cut using medium cardstock and your fine point blade prior to completing these steps.



12. Once the machine has finished cutting all of the project pieces on one material sheet, you will be prompted to verify that the pieces have been cut all the way through.



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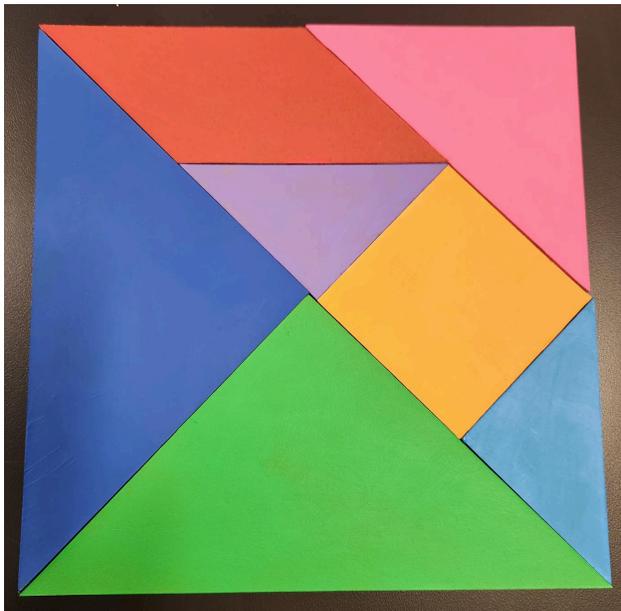
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Gently try to lift part of the design from the mat. If this is sufficient, press the flashing load/unload button.

13. Remove all of the pieces carefully. Then, remove the remaining material and tape from the mat. You may need to use the scraper tool to get all of the tape off.

Painting the puzzle pieces:

1. Take each piece and paint it a different color. Alternatively, you can use Cricut Smart Sticker Cardstock and repeat the cut to get sticker cardstock pieces that are exactly the same size.



Template Links

Tangram Puzzle:

- <https://design.cricut.com/landing/project-detail/65df57afc861e82677052d7f>