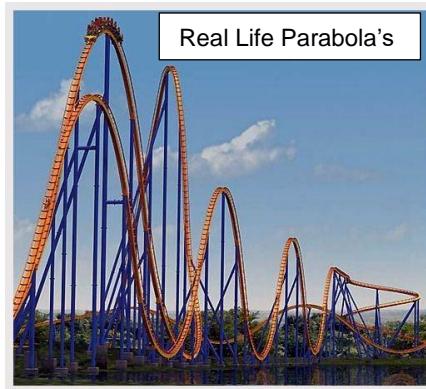
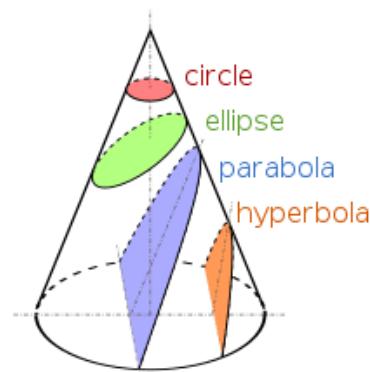


STEM, which stands for Science, Technology, Engineering and Mathematics do not seem to have much in common with ART, but ART and STEM work together all the time. As an example, ART makes it possible for STEM theories and ideas to be visible in the real world through drawings, plans, designs, and model building. The mathematical definition of a parabola is “the U-shaped curve made by the intersection of a cone and a plane!”



How could we understand the beauty of a parabola without a drawing or a model to look at? ART to the rescue! ART adds creativity to STEM ideas which leads to innovation and discovery.

IDEA DESIGN CREATE INNOVATE

Parabola Art Project



STEAM: Art

ART adds visibility to STEM ideas which leads to innovation and discovery.

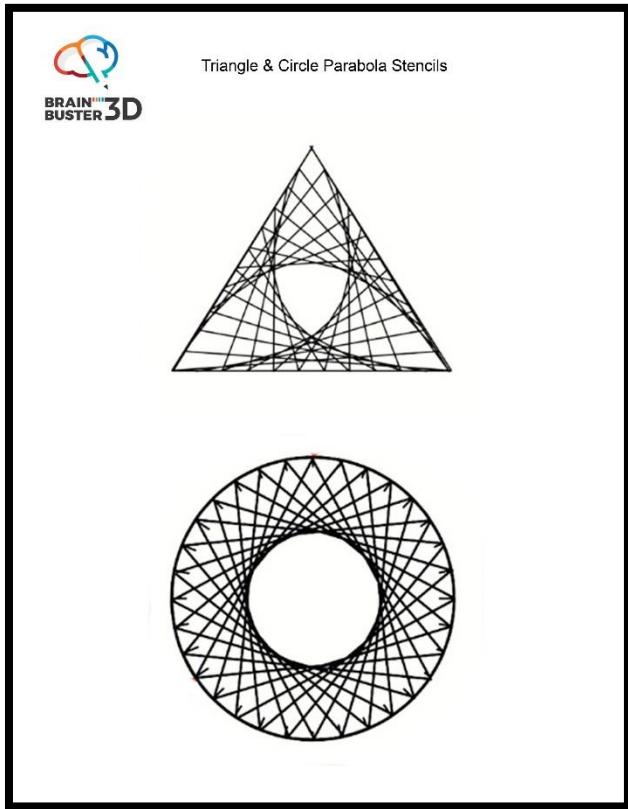
IDEA DESIGN CREATE INNOVATE

Creating triangle & circle parabola models will help your child learn how to apply Art Skills to STEM. How?

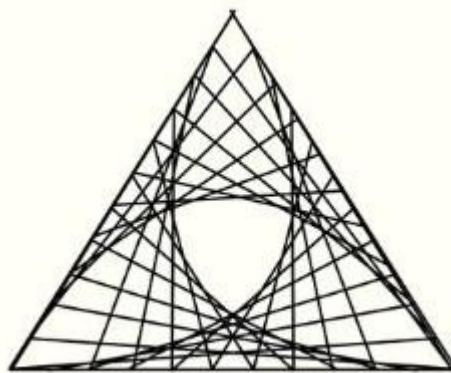
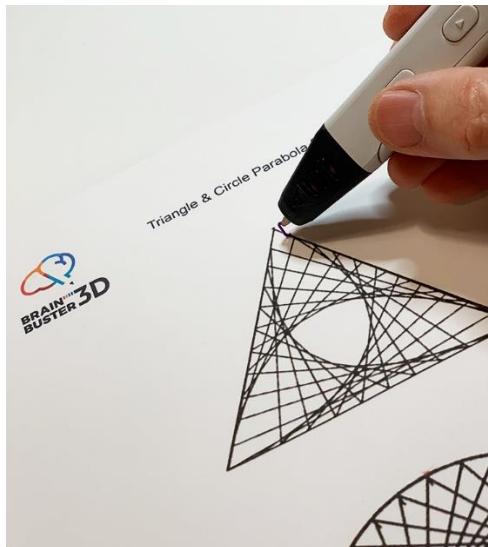
- They will be using the stencil to create the design elements of the two types of parabola, a triangle, and a circle.
- They will have the opportunity to design their own parabola.

Materials Needed: Parabola Stencil (page 6), 3D Pen, 2-3 colors of PLA filament, scissors, silicon thumb & finger protectors, a paper towel or napkin. “Make Your Own” Parabola Stencil (page 7)

Optional: To keep the stencil intact, place it in a plastic sheet protector.



STEP ONE:



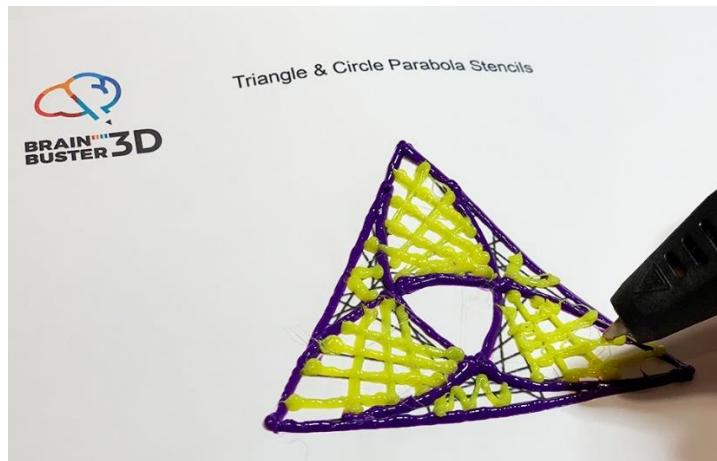
Make a copy of the Triangle & Circle Parabola stencil. If you need directions about how to operate a 3D pen, please refer to the Parent Guide for Operating a 3D Pen. Once the 3D pen is heated and loaded with filament, help your child find a starting point on the stencil to anchor the filament. Have your child move the 3D pen along the exterior of the triangle.

STEP TWO:

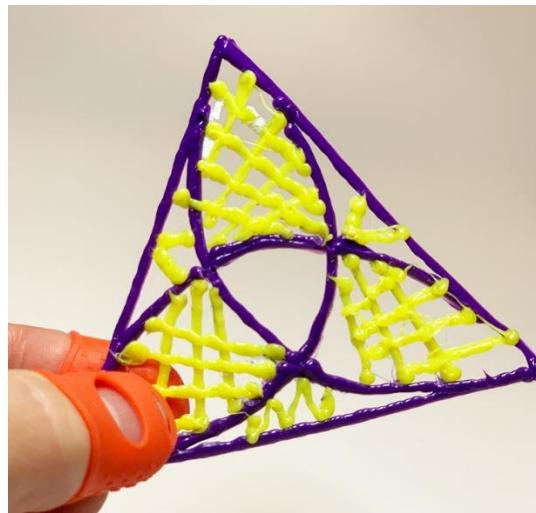


Have your child outline the triquetra inside the Triangle.

STEP THREE:

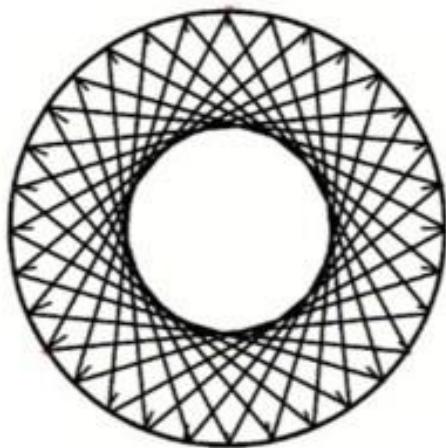


Next, trace the lines within each section of the triquetra to create an interesting design.

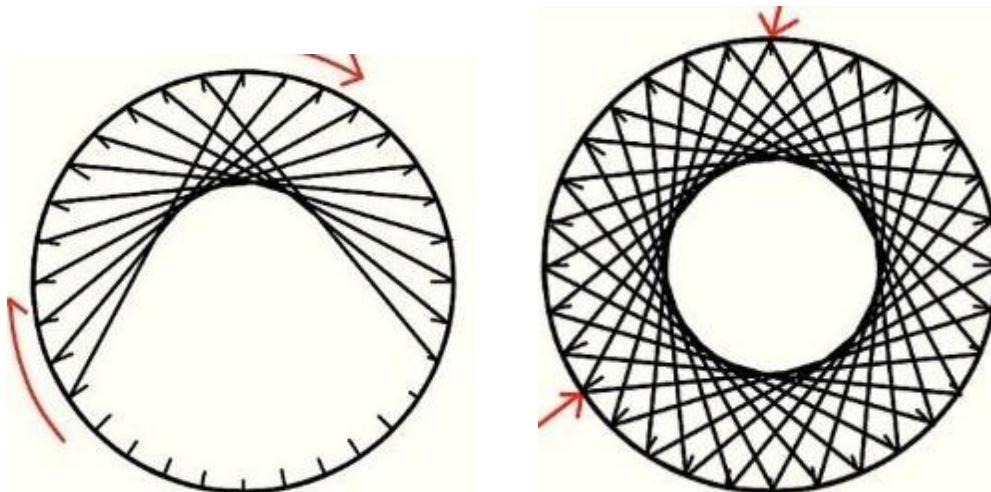


If they use a plastic sheet protector, the triangle parabola should peel off the stencil easily. If they made it by extruding the filament directly on the paper stencil, some of the paper will stick to the back. To remove the paper, rinse it with warm water and dry with a paper towel.

STEP FOUR:

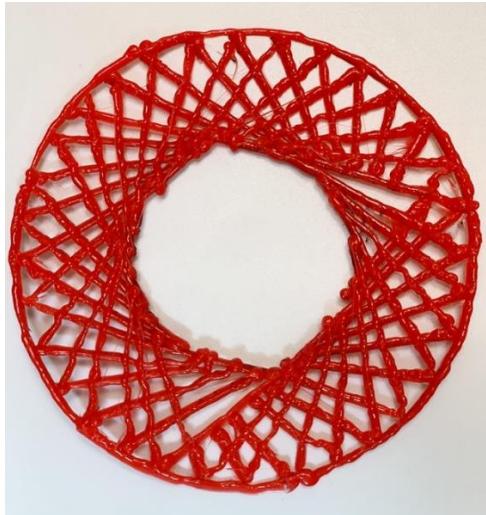


The circle parabola creates an optical illusion. The lines appear curved when they are straight lines.

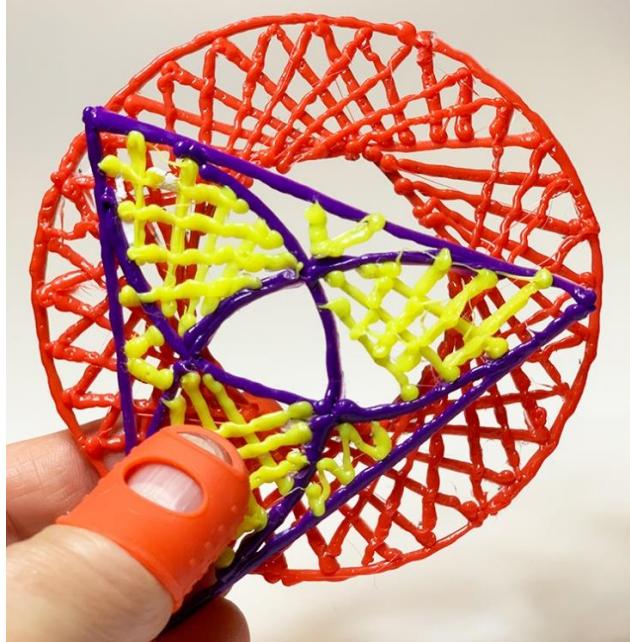


To start, your child will find a point on the outside of the circle. Next, they will draw the lines in the interior of the circle with the 3D pen by finding a start and end point as pictured. They will draw straight lines inside the circle clockwise until they return to the starting point.

STEP FIVE:

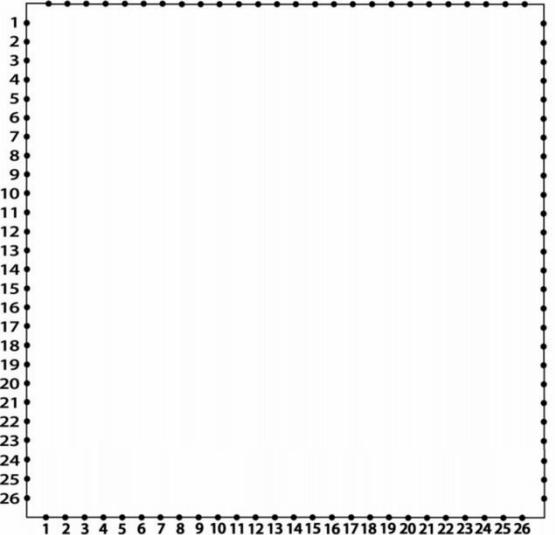


If a plastic sheet protector was used, the circle parabola should peel off the stencil easily. If made by extruding the filament directly on the paper stencil, some of the paper will stick to the back. To remove the paper, rinse it with warm water and dry with a paper towel.



 Make Your Own Parabola Stencil

Using a ruler, draw your own parabola stencil. Use your 3D pen to complete your design.



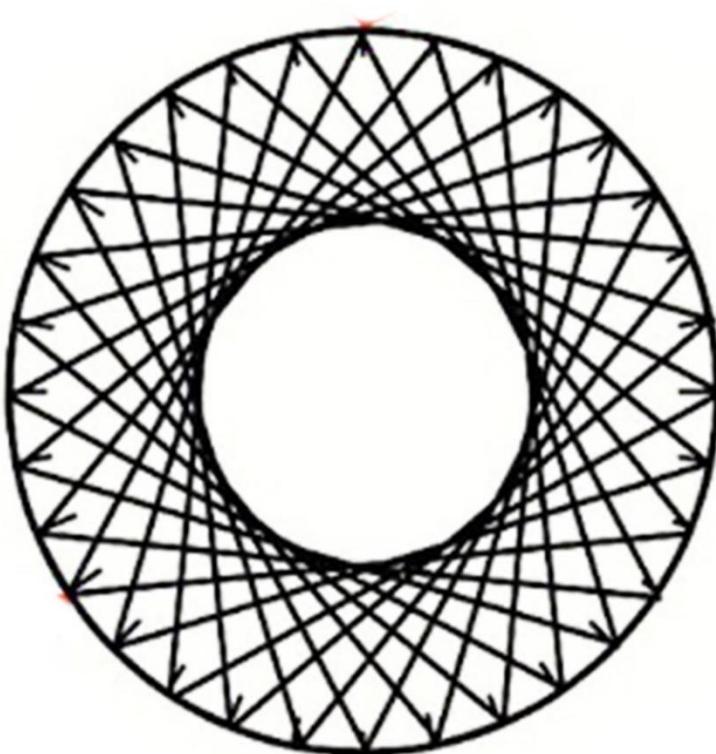
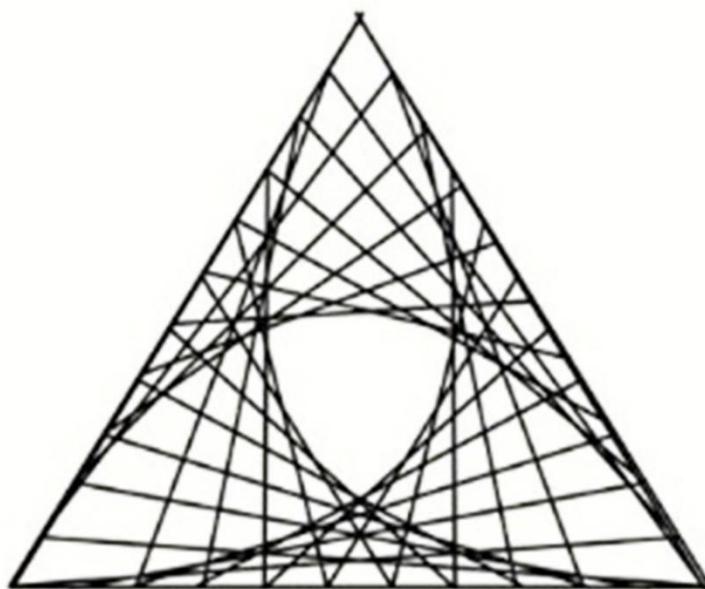
The triangle and circle parabola designs are now complete!

A second stencil is provided for your child to create their own parabola design.



BRAIN^{!!!}
BUSTER 3D

Triangle & Circle Parabola Stencils





**BRAIN
BUSTER** **3D**

Make Your Own Parabola Stencil

Using a ruler, draw your own parabola stencil. Use your 3D pen to complete your design.

