



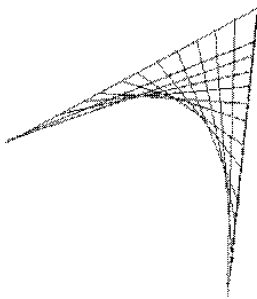
Description:

Who says you cannot create curves with line segments? It is fascinating to discover a curve formed from a series of straight line segments. Line designs utilize basic geometric forms, making curves out of segments. Order and symmetry are the basis of string art's appeal. Elaborate designs can be created with geometric shapes, points, and colored string.

Line designs form a basis for mathematical understanding of geometric shapes and relationship of points, segments, and angles. Each of the line segments is really a tangent for each of the curves being formed. But because of what we focus on, we often see the curves.

Attractive and sophisticated line designs can be produced and created using only a ruler, compass, protractor, pencil, and paper. Computers can be used to imitate this procedure. Geometer's Sketchpad is a software that can be used. Symmetry— line symmetry, rotational symmetry, and point symmetry bring interest and charm to your string art.

Start with this:



You can use nails, wood, foam core or cork with strong pins, or a stiff piece of cardboard or thin wood with holes in it to provide your working surface. You can paint or cover the working surface. String, embroidery thread or thin yarn can be used to stitch your piece of mathematical art. The original placement of the nails/holes help to determine the shape of your final project. For instance, if you construct the diagonals of a regular 24-gon (icosikaitetragon) you will be able to see many concentric circles. By adding layers, different colors, and/or varying the way you connect the nails/holes, the design gets more interesting. Sometimes the empty spaces in the design are as important as the placement of the string.

Requirements for this project:

** All materials will be supplied for you. You will be given a square board, nails, spray paint and string.

** First you will select a design online. Next you will use Geometer's Sketchpad to create the design. You should spray paint your board prior to placing nails in the board. Once dry, then you will use your Geometer's Sketchpad design to locate the points for each nail. Finally, you can use the string to finish your project.

** Your project must have a way to hang on the wall.

** You will make a brief video explaining the symmetry that exists in your String Art Design. Please watch the video on my website ("[Click here for a Symmetry Video](#)"). You should take a picture of your string art and then create a video (maximum 1 minute) explaining the symmetry in your project. You may also highlight any Geometric terms (i.e. same side interior angles, etc..) that exist in your design. You should use iMovie for the final production of the video. I suggest you use Explain Everything to record and talk about the symmetry of your design. When your video is complete, I will download your video the MacBook (please do email it).

FOUR things are to be turned in:

(1) Your 3 designs on sketchpad. Please do not print these. Show me Mrs. Gagnon in class.

(2) Your **original design** on paper.

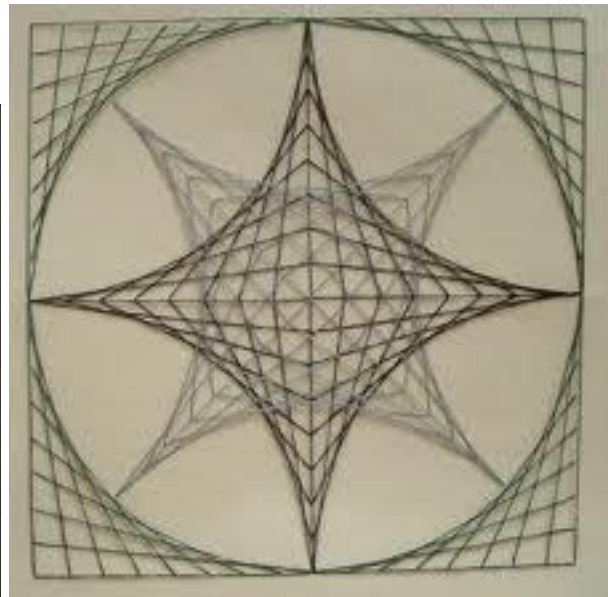
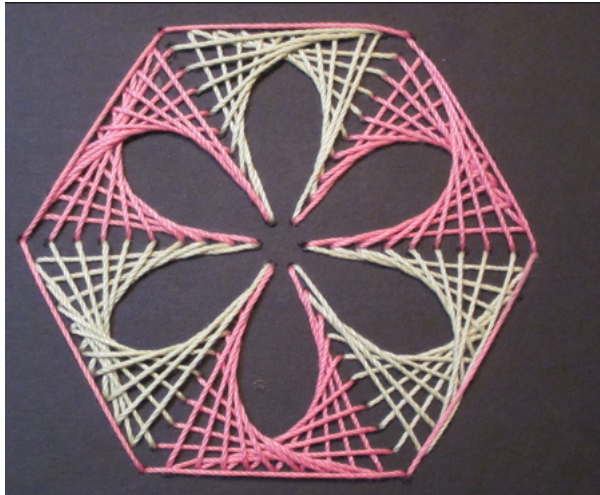
The plan should be constructed on Geometer's Sketchpad. The plan should include colors and the exact design to be used on the project. (20 points)

(Suggestion: make two copies so that one can be turned in and one (photo copied) to aid in nail/pin/hole placement.)

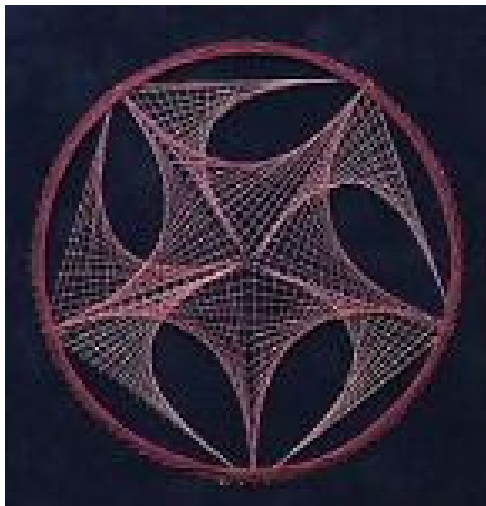
(3) Your **completed string art** project. The final project cannot be longer than 15" x 15" if it mounted on a flat surface or it should fit into a 15"x15"x15" cube it is 3-dimensional. Place a hanger on the back of the flat string art (the tab on a soda can nailed to the back works well and can should not cost you anything) or a string hanger on 3 dimensional projects. Put your name, on the back of your project.

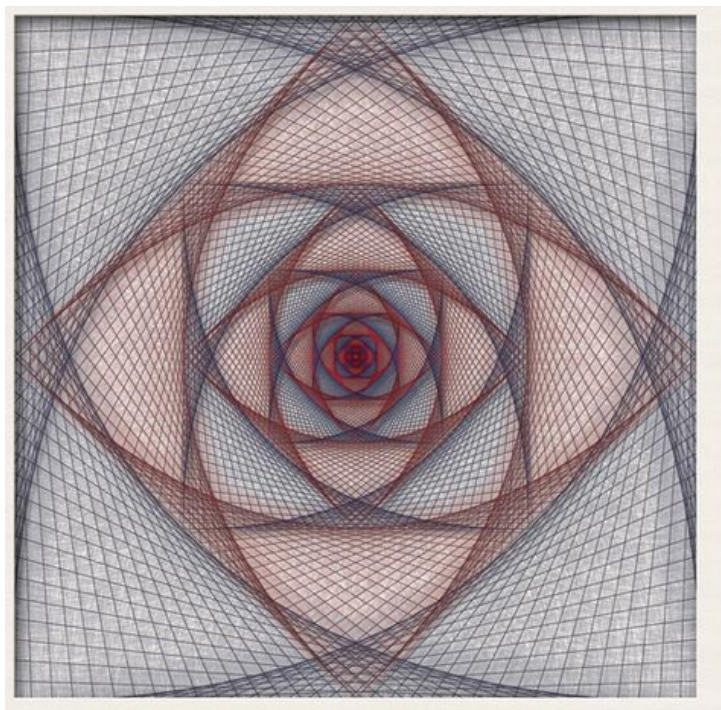
(4) A **video** with examples of symmetry. The video should be created on the iPad using Explain Everything and iMovie.

Design #1 and #2:



Pick one of these designs on Sketchpad (extra credit for both)





PLEASE DO NOT PRINT – SHOW MRS. GAGNON WHEN COMPLETE.

Category	Points Available	Points Awarded
Design: Create design #1 and 2 using Geometer's Sketchpad	20	
Design: Pick one of the challenging designs (10 bonus points for additional design)	10	
Your Design: Creative & Challenging design (must be approved by Mrs. Gagnon first)	5	
Design: Design is created using postulates, theorems and definitions used in this class, used the program to insure symmetry (for example: perpendicular lines were constructed instead of drawing lines that appeared to be perpendicular)	20	
String Art: Neatly and accurately constructed according to initial design	5	
String Art: has a way to hang the project	5	
String Art: Lines are used effectively in the design to accentuate and illustrate curves	5	
String Art: use of color in the final project	5	

Video: video has smooth transitions, can read all text, nice overall presentation, 1 minute or less	5	
Video: Recognize correct type of symmetry in your design, present and explain the type of symmetry	20	
Optional Extra Credit: Three dimensional string art project		
TOTAL	75	

*10 points off for each day the project is late