

String Art

By Andrea Ervin, Clark County 4-H Alumna and Owner of Nailed It! String Art Designs.

Reviewed by Jane Keyser, Extension Educator, 4-H Youth Development, Ohio State University Extension..

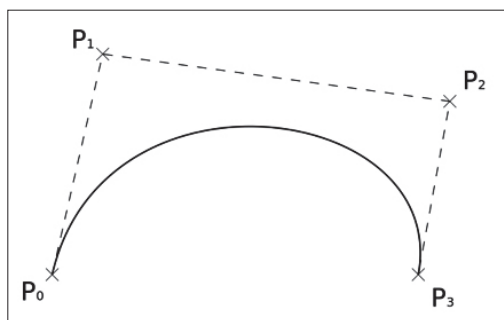
String art, also known as pin and thread art, is a creative, unique, and beautiful way to create personalized décor. The process consists of stringing thread between nails to form a design of your choosing, usually on a wooden board. String art designs can be small or large, simple or complex, and white or multi-colored.

History

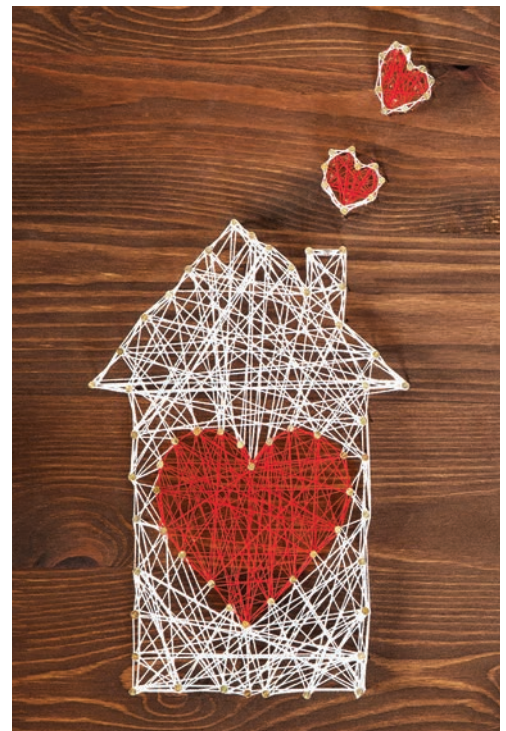
String art started as a way to demonstrate math and engineering principles. It was created by Englishwoman and teacher, Mary Everest Boole. She used curve stitching to make math fun for her young students.

Pierre Bézier, a French mathematician and engineer, developed a curve formula known as the Bézier curve. Bézier worked for an automobile company in the 1960s and used the curve in the design of cars.

Bézier's curve is said to have inspired a number of artists, one of whom was American artist, John Eichinger. Eichinger created geometric string designs called mandalas, which is a Hindu word meaning circle within a circle. By using the Bézier curve in string art design, Eichinger created an optical illusion of curves within a circle. Today the Bézier curve is used in animation and in the design of computer fonts.



Bezier curve, en.wikipedia.org/wiki/B%C3%A9zier_curve



PLAN YOUR PROJECT

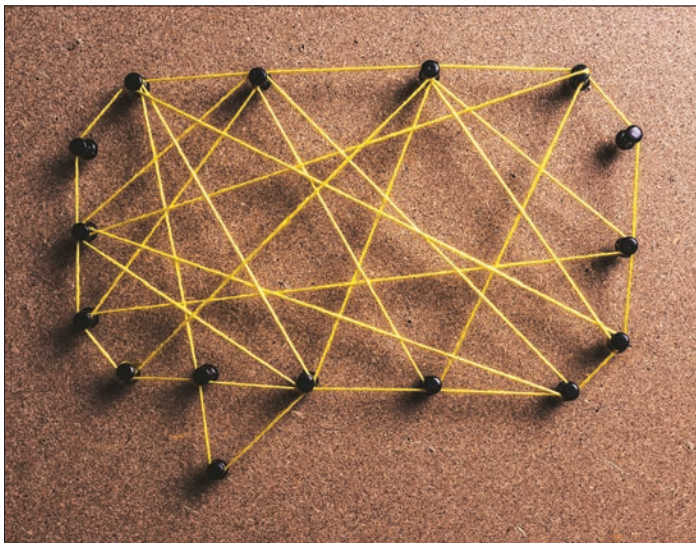
Use this idea starter AND publication 4-H 365 *Self-Determined Project Guide* as the starting place for your 4-H self-determined project. The *Self-Determined Project Guide* is available from your county OSU Extension office or on the Web at ohio4h.org/selfdetermined. You may choose to do a little or a lot depending on your level of interest. Be sure to register your project with your county OSU Extension office.



Planning

When planning your string art project, choose a design that is practical for your level of experience. If you are making string art for the first time, choose something simple, such as a geometric shape, a letter of the alphabet, the 4-H clover, or a smiley emoji, and use no more than three colors.

After your first project is complete and you have a good understanding of the technique and design, you can create anything you like. The possibilities are endless! Keep in mind that simple is often beautiful. Complex does not necessarily mean better.



Start with a simple shape and one color of thread so you can learn the basic techniques for nailing the nails and stringing the thread.

Supplies

String art can be created with these five common items: hammer, scissors, wooden board, nails, and thread. Researching these items online or in a store can be very helpful, especially when setting up a budget for your project.

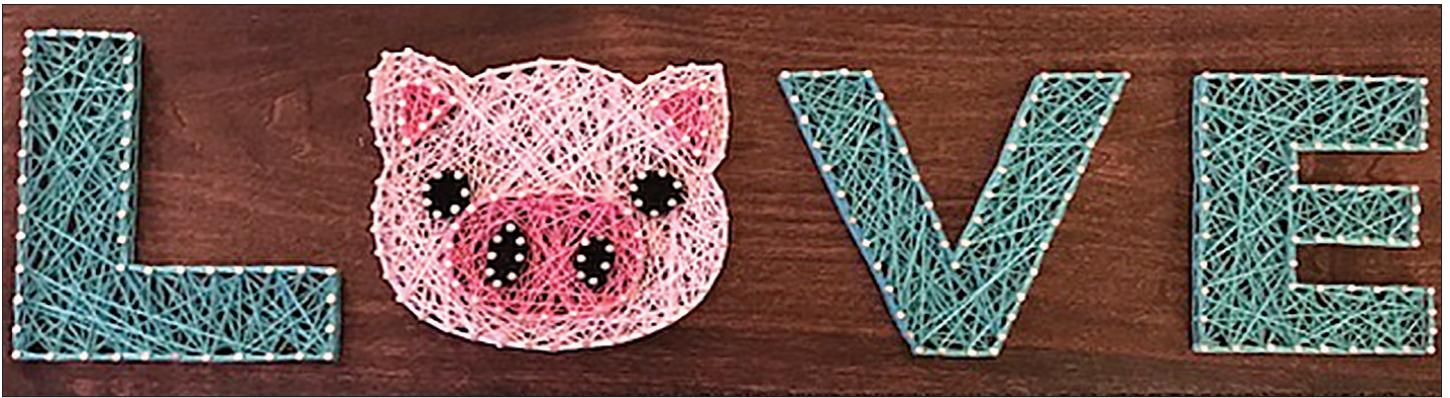
- **Hammer.** Choose a hammer that is small and lightweight to prevent injury to your wrist and arm.
- **Scissors.** Choose scissors that are appropriate for you. Always ask an adult for help if needed.
- **Wooden board.** Choose a piece of wood that is the right size for your design. You can always have an adult cut the wood to the right dimensions. You want the wood to be lightweight

enough to be able to hang up, but thick enough that the nails do not go through the other side of the board. Poplar is a good choice. To prevent injury from splinters, sand any rough edges of the wood with sandpaper. Craft stores and lumber yards are good sources.

- **Nails.** Choose nails that are thick enough not to bend easily and thin enough not to split the wood; wire nails that are 17 gauge and $\frac{3}{4}$ inches long are preferred. The nail also should have at least a small head on it. The head is what holds the threads on. As you gain experience, you can experiment with shorter nails and nails with larger or smaller heads. Most hardware stores, home improvement stores, and lumber yards offer a wide variety.
- **Thread.** Crochet thread is a good option because it is thick and shows up nicely against your board. Yarn that is not too thick works well too. Both are available in many colors.

Other Helpful Items Include These:

- **Transparent tape.** Use tape to secure your design on to the wood.
- **Paper and pencil.** Create and sketch your design with paper and pencil first. If the board you are using is bigger than your paper, use tape and add paper to it until you get the right size. Notebook or graph paper is a good way to keep your design straight and proportioned to your board.
- **Tweezers.** After you nail your design and pull the paper off the board, small pieces of paper might be stuck around the nails. This is normal. Use the tweezers to get the excess paper off the nail as best you can.
- **Wood stain.** This is optional. You may also want to stain the wood. Stains come in all shades. Some wood stains make the thread colors really stand out. Use good judgment, though. You do not want a dark wood stain for a design with dark colored thread. Always ask an adult for assistance when applying the wood stain.
- **Clear nail polish.** This is also optional. Use a tiny drop of clear nail polish to secure beginning, ending, and other knots.



Andrea Ervin, [facebook.com/nailedstringartdesigns](https://www.facebook.com/nailedstringartdesigns)

This project seems complex, but is really a series of shapes strung in a random pattern. Because it has shapes within the main shape, the hardest part is the pig.

Creating

1. Draw your design. Computer printouts are readily available, but to avoid copyright infringement, you are encouraged to simply draw your own. If you find designs online that are clearly labeled public domain, you are free to use them.
2. Place your board on a sturdy surface.
3. Gather all your supplies.
4. Center your design on your board. Once it is in the right spot, tape it to the board.



Nails are in place and ready for the next step.

5. Start nailing! Place the nails on the lines of the drawing. Be mindful of the space between the nails. They should not be too far apart nor too close together. If you make a mistake, simply pull the nail out and try again. Also be mindful of how far the nail is put in the board. If it is too far into the board, there may not be enough room for stringing. If it is not in far enough, the string is likely to pull it out. As much as possible, the nails should be nailed to the same depth.
6. Carefully pull the paper off your board. Use tweezers to remove any small pieces.
7. Choose your thread colors.
8. Make a tight double knot around the starting nail. Start stringing your design by pulling the thread to a different nail, wrapping it once around the nail, and going to another nail. Repeat this process until you are satisfied with the thickness of string on your design. There are many ways to string a design. It can be done randomly or by pattern. This is your design. Make it your own!
9. When finished, double knot the string on the nail and cut off any excess string. A tiny drop of clear nail polish is a good way to secure your knots too.

COMMON QUESTIONS

Q. Does it matter how many nails I use?

No, it does not matter how many nails you use. However, you want the nails to be placed evenly. You can use a ruler to place them a certain distance apart or you can simply estimate it. Whether you use eight or 16 nails to make a square, for example, be consistent and place the nails evenly.

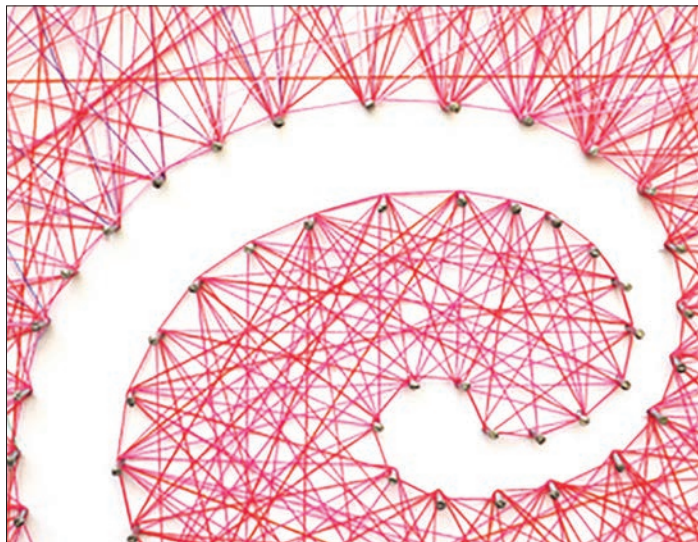
To make a straight line, the nails can be close together or far apart. It is up to the designer. To make a tight curve, the nails should be closer together to show the curve. If your design has intersecting lines, make sure to put the nails where they intersect.

Q. What is the effect of the pattern of the nails being strung across from each other?

The placement of the nails is important to ensure the outline of the design is intact and complete. If even one nail is off in the outline it can change the picture. How the string is strung within those nails can be in a pattern or completely random. That is up to the artist.

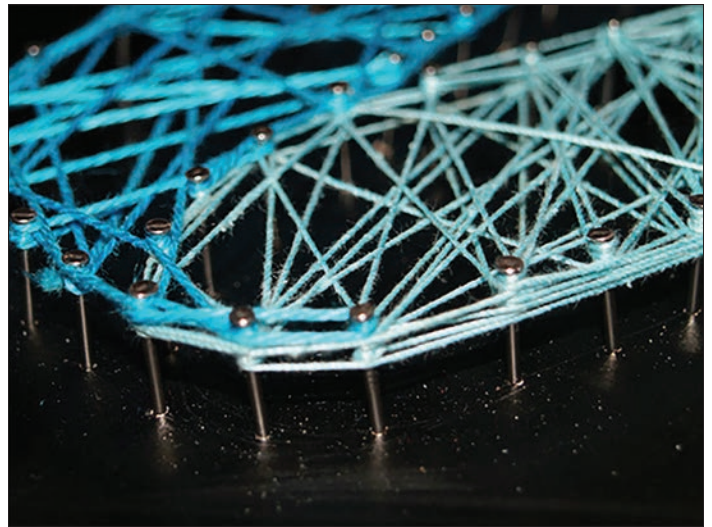
Q. What if my thread is too short?

If you think the piece of thread you are using is too short to complete the design, before it gets too short, attach another length of thread to the original using a few overhand knots. A square knot is most secure. The knot may end up in the middle of your design, but you should be able to bury it under other threads. Another approach is to simply tie it to a nail and start a new thread in the same place. Be careful though! You may end up with too many knots on a nail.



Source: "Destiny Protect me from the World" by Dominique Falla. CC BY-ND 4.0.

These nails are close enough to show a nice curve.



"String Art" by Anthony McCann, CC BY-NC 4.0.

AREAS OF INTEREST AND THINGS TO DO

Every self-determined 4-H project can be broken down into areas of interest. These are the specific things members want to address during their project adventures. Using 4-H 365 *Self-Determined Project Guide*, identify at least three areas of interest with at least three activities per area to explore. Take your ideas from the following lists, or make up your own.

Explore Different Tools and Supplies

- List all the tools needed to complete your project. Make a supply box to hold them and present it at 4-H judging along with your art.
- Select a small simple design and make samples of it using different nails, thread, or backgrounds.
- Develop a notebook of designs. Search coloring books, go online, or draw your own.
- Study the color wheel to see how thread and background colors can enhance each other.

Document the Process

- Make a scrapbook of your string art journey to present at 4-H judging.
- Use a web or mobile app to make a stop motion movie of your project being created. Apple and Android devices can use the free version of Stop Motion Studio. (The special effects, which are

not free, are not necessary.) If you do not have a smartphone, upload your images to a computer and use an online gif maker to make the stop motion video.

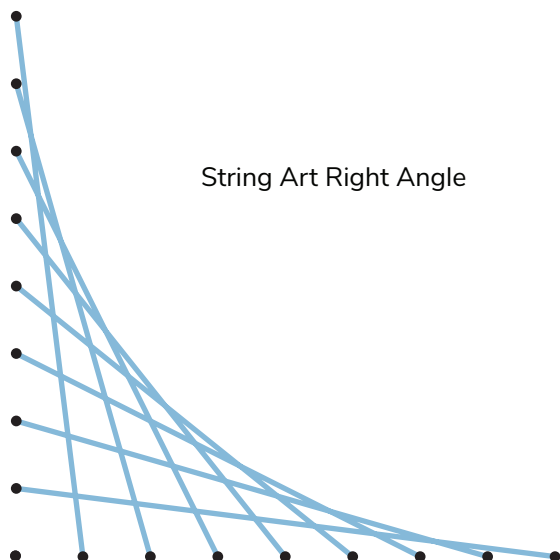
- Make a poster to teach others how to get started with a simple string art design.
- Make a short series of designs that show how the same shape can be simple or complex.
- Learn more about mandalas. Share what you learn with your project helper.

Practice Makes Perfect

- Practice tying a secure knot around a nail with thread. Once you are good at it, teach someone else.
- Practice hammering nails into a piece of scrap wood. Keep practicing until the nails are straight and secure without going through the board.
- Demonstrate your craft to your friends, family, or club or group members.
- Find at least one other string art artist, perhaps at a local craft show. Interview them about their experiences with string art. Write a brief summary of the interview.

String Art and Mathematics

- Use evenly spaced nails to make a square on a piece of board. Attach a long string and use it to make temporary simple shapes like a triangle, star, rectangle, and hexagon. Share your board with someone who is learning about basic shapes.



- Use evenly spaced nails to make a square on a piece of board. Attach a long string and use it to divide the square into equal portions that illustrate fractions— $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, etc. Share your board with someone who is learning about fractions.
- Use evenly spaced nails to make a circle on a piece of board. Start with any nail and make the shape of a triangle within the circle. Make another triangle beginning with the nail to the left of your starting nail. Continue to do this until all the nails are used. The more nails you use to create the original circle, the more complex your design. Try using color changing string for a beautiful effect.
- Use evenly spaced nails to make a square or rectangle on a piece of board. Use a different color for each corner and create curves by overlapping straight lines as shown here. This is a parabolic curve.
- Learn about and use the curve-stitching patterns from the team that was recognized at the American Mathematical Society's activity at the USA Science and Engineering Festival: ams.org/publicoutreach/curve-stitching.

More Ways to Do String Art

- Another kind of string art uses white string on black cardstock, without the nails. On an 8-inch square piece of graph paper, draw points to make a symmetrical pattern. Transfer the pattern to the cardstock and use a large needle and string to make your design. For step-by-step instructions, go online and search for "United Art Project #107."
- Demonstrate how straight lines can create curves with a series of increasingly complex string art pieces. You can use the same pattern with more connections between the nails, or you can use a pattern with more nails. You decide.
- Create a pattern that showcases all the colors of the visible light spectrum, also known as ROYGBIV, or red, orange, yellow, green, blue, indigo, and violet.
- Use your skills to make something functional, such as a picture holder or key hooks.
- Create a shape in negative space by filling in the space around it with thread.
- Make a picture of something—a sailboat on water, the moon over a forest, a cat's face—by using a combination of smaller shapes on one board.

RELATED RESOURCES

Pinterest, Etsy, and Google are great ways to find ideas and inspiration for designs and patterns. You can find the supplies you need at hardware stores, hobby and craft stores, and some department stores.



Andrea Ervin, facebook.com/naileditstringartdesigns

The heart in this design is created with negative space.

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