

# SCALLOP STRING ART

The string's the thing!

## Curriculum topics:

- Patterns
- Texture
- Describing and Forming Geometric Shapes
- Circles
- Angles and Triangles
- Chords

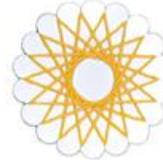
## Subjects:

Art, Math

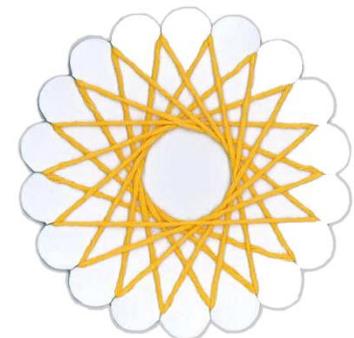
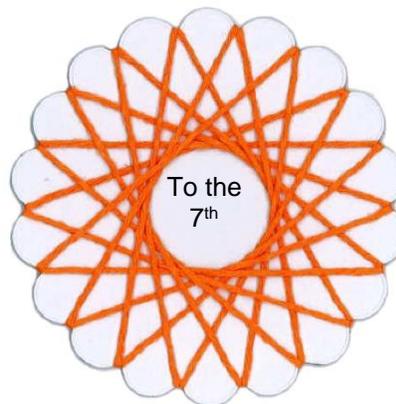
Grade range: K – 12

## Who we are:

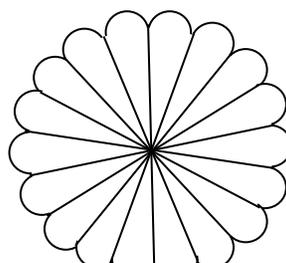
Resource Area for Teaching (RAFT) helps educators transform the learning experience by inspiring joy through hands-on learning.



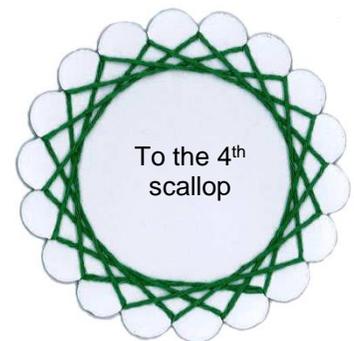
Use colored string and simple cardboard shapes to create artistic designs based on intriguing mathematical patterns. Every pattern has infinite possibilities! String art is fun for all ages - to fix a mistake or try a new approach, just unwind the string!



To the 7<sup>th</sup> scallop with slits



To the 9<sup>th</sup>

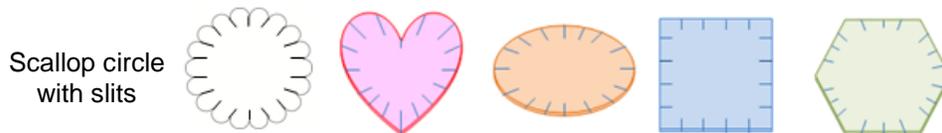


# Materials required

- Cardboard, matte board or equivalent (x1)
- Yarn, heavy thread, or string
- Tape
- Optional: Scallop circle template (page 4)

## Set-Up

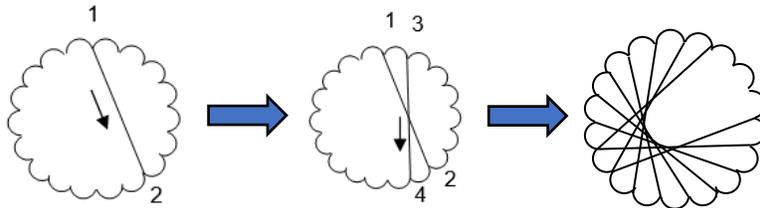
- 1 Cut a scallop circle or other shape using a template (see page 4) or by hand. Smooth or straight edge shapes can be also used. Cut evenly spaced notches into the edges and small slits to prevent the string from slipping out of place (see below).

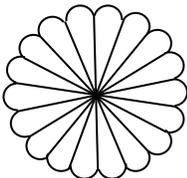


- 2 Tape one end of the string to the back of the scallop circle / shape.

## To do and notice

- 1 Bring the string around to the front of the scallop circle by passing over one of the notches on the edge of the shape (notch 1).
- 2 Pull the string toward a notch that is the selected number away from notch 1, moving either clockwise or counterclockwise as seen from the front of the shape. For example, if a person chooses a notch 7 spaces away from notch 1, notch 2 would be located as shown below (left).



- 3 Hook the string in the selected notch and wind the string around the back of the shape and then bring the string back to the front immediately to the right of notch 1 continuing in the same direction (see above right, notch 3). The basic movement is: 1) **come up** (back to front) one notch to the **right**, 2) **go down** (front to back) one notch to the **left**.
- 4 Stretch the string across the front and toward the notch that is next immediately to the left (notch 4 above). Repeat the pattern until all the notches have been filled twice, or, fill the notches only once if the string goes past the center of the circle (at right).
- 5 Cut the string and tape the end to the back of the circle. Alternatively, tie the ends, or glue them. For a layered design secure a second piece of string with a contrasting color to the back as before, bring to the front, and then stretch the string to a notch that is closer than the one used in the earlier pattern. For example, if the first pattern skipped 6 notches, then the second pattern might be made by skipping 4 notches. Add more colors as desired!

## Content Standards:

### CCSS MATH

Measurement & Data (understand and measure angles):  
[4.MD.C.5](#)

Geometry (reason with shapes and their attributes):  
[1.G.A.1-3](#)  
[2.G.A.1-3](#)  
[3.G.A.1-2](#)

Geometry (line segments & symmetry):  
[4.G.A.2-3](#)

Geometry (circles: inscribed angles, radii, and chords)  
[HSG.C.A.2](#)

### CA VISUAL ARTS:

Generate and conceptualize artistic ideas and work:  
[K-12.VA.Cr:1.1](#)

# The content behind the activity

Line designs like those in this activity are great for exploring basic geometric concepts. String art uses straight lines to create curved shapes such as circles, parabolas, ellipses, hyperbolas, and spirals. Each of the line segments is a chord of the circle.

String art originated in the “curve stitching” activities that were invented by a self-taught female mathematician named Mary Everest Boole at the end of the 19<sup>th</sup> century to make mathematics more accessible to children. In the 1960s and 1970s, string art became very popular as a decorative home craft depicting either abstract geometric patterns or representational designs. Today, string art continues to be a popular activity in both math and art classrooms.

## Learn more

- At equally spaced slots around the scalloped circle, string the following shapes:
  1. A right angle
  2. An acute angle
  3. An obtuse angle

Choose one of the above angles and create a circle string design on the scalloped circle starting each time at different locations by repeating the same angle four times.

- Use a compass, protractor, straightedge, and colored pencils to draw a string art pattern based on a circle, then recreate the pattern with string. Use the protractor to measure the angles, and then divide the circumference into equally spaced lengths.
- Draw patterns based on parallel and perpendicular lines. Create the patterns using string art and compare the patterns.

Visit <https://raft.net/resources-2/> to view the following related activities!

Pattern Blocks  
Patterning with Polygons  
Tangrams  
What are Penrose Tiles?  
Making 3D Shapes  
Shape Skeletons  
Stick Polyhedra

## Resources

- YouTube video (8:41), String Art Cards - <https://bit.ly/2JvcwVB>
- Teacher's Network, String Art - <https://bit.ly/3dRQLNJ>
- YouTube video (17:39), Mandala String Art - <https://bit.ly/2UVVQeS>

# Scalloped Circle Patterns

