

Try these challenges

Remember, no loose ends!

What is the longest kolam you can make?
What is the shortest? Can you make a kolam with ALL of the tiles?

How many letters of the alphabet can you write in kolams? Can you write a message?

How many kolams can you make with only one dot? With two dots? With three dots? How do you know you have them all? How long can you keep going?

Can you make a kolam with just diamonds or just circles? Or with just doors or just eyes or just fans? Can these kolams be different sizes? Are you sure you made a kolam?

How many 2 x 2 kolams can you make? 3 x 3 kolams? 4 x 4 kolams? Can you keep going?

What if you try to make kolams with 4-fold rotational symmetry (meaning if you rotate it four times you always have the same kolam)? Try making kolams with different kinds of symmetry – like diagonal mirror symmetry.

Can you design a kolam challenge and give it to someone else?

What is the most beautiful kolam you can make? Why is it beautiful?

About Us

Amy Alznauer is a mathematics lecturer at Northwestern University and author of *The Boy Who Dreamed of Infinity: The Life of the Genius Ramanujan*,

Venkat Gopalan is a materials physicist at Penn State University and a symmetry and kolam expert. For example, www.youtube.com/watch?v=WpILrnoKREs

We are so excited to bring the beauty and possibility of kolams to children and to people of all ages.

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Find out more:
www.kolamtiles.com
Instagram: @kolamtiles

Play with Kolam Tiles digitally
mathigon.org/polypad

Order more Kolam Tiles from
talkingmathwithkids.com/shop/

kolam tiles

a tiny guide

kolam:

a traditional geometric art form from South India mostly practiced by women who use rice or chalk dust to draw a pattern of curves and lines around a grid of dots.

These lines and dots form **six basic shapes** or tiles:



diamond

fan

door

eye

drop

circle

What name would *you* give each shape?

You can make ∞ kolams by following just **one rule:**

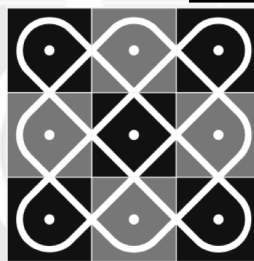
No loose ends!



Loose end! →

Can you find the loose ends in the kolam to the right?

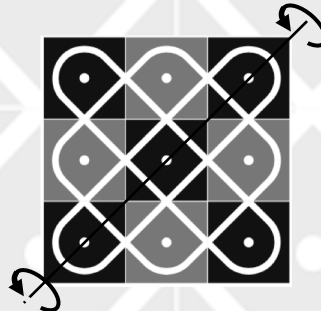
Some kolams have **rotational symmetry:** They look the same when rotated a quarter or a half turn.



If you make a quarter turn, is it still the same kolam? What if you keep turning?

If a kolam looks the same every quarter turn, it is said to have a *4-fold* rotation axis. What would a *2-fold* rotation axis mean?

Some kolams have **reflectional** or **mirror symmetry:** They look the same when you flip them across a line.



Does this kolam have other mirror symmetries? (Think diagonals, vertical or horizontal lines)

Try making these kolams

... and find the loose ends. Can you fix them?

