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Sashiko Workshop: Experiential Geometry

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The objective for this workshop is to experientially understand the connection between textile and math by drafting and stitching simple underlying grids from which all sashiko patterns are derived. This demonstrates the intrinsic connection between textiles and math.

This hands-on presentation taught the essentials of sashiko pattern drafting and stitching to facilitate an experiential understanding of geometry and subdivision of the stitched plane. Each participant received a threaded needle and a fabric square prepared with a grid, the underlying structure for all traditional sashiko patterns. I guided the participants through the process of sewing and drawing stitches through the grid in the efficient sequence of parallel lines. A selection of traditional patterns that have the stitching orders and subdivisions identified was provided in the materials insert provided in the symposium packet.

The activities will illustrate the how math is a structural component of sashiko and how math defines the process for developing sashiko patterns.

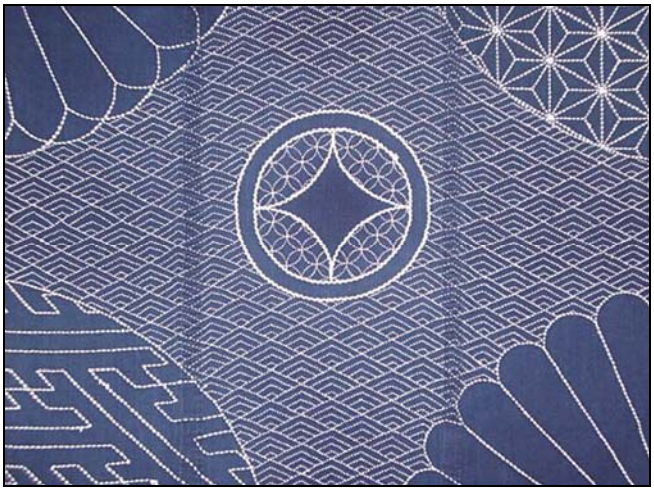


Figure 1. Furoshiki detail.

What is sashiko?

Sashiko is running-stitch embroidery and a quilting technique sewn with white thread into indigo dyed fabric, and is characteristically identified by complex geometric patterns.

Who sewed sashiko? When and where was it done?

Sashiko was developed and practiced by the farmers of Northern Japan. It flourished during the last feudal era of Japan under the Tokugawa Shogunate between 1615-1868, because the ruling classes retained the rights to silk, cotton and wool: the warm and durable fabrics. The farmers had to use the indigenous bast fibers of their region to make their clothing.


Figure 2 (left). Farmhouse-exterior.
Figure 3 (right). Farmhouse-interior.

Why did the farmers use bast fibers?

The farmers needed warm and durable clothing to withstand the wear and tear of their daily lives. The winters in this region of Japan are long, cold and snowy. Three or more layers of fabric were quilted together and layers of clothing were worn to protect the body from the cold.

They had to grow, process, weave and dye fibers, such as hemp and flax, to make into their clothing. Everything was done for function and no time or material was wasted.


Figure 4. Saki-ori vest (left); detail (right).

How were sashiko garments made?

The fabric was dyed in indigo for the pungent odor of the dye, which repelled pests that would destroy the garments. The sewing thread was not dyed and left natural in color, because the purpose of sashiko was to reinforce the fabric for repairs, strength and durability, and sew layers quilted together for warmth; hence, the distinctive appearance of sashiko.

The seasonal nature of farming life made it necessary to construct and repair the family's clothing only during the winter months around the household hearth.

The tradition was for grandmothers and granddaughters to work on the family clothing, which was how technique and patterns were transmitted between generations.

In this session we gather, not around an intimate hearth, but in a large meeting hall to transmit how sashiko patterns make a connection between textiles and math.

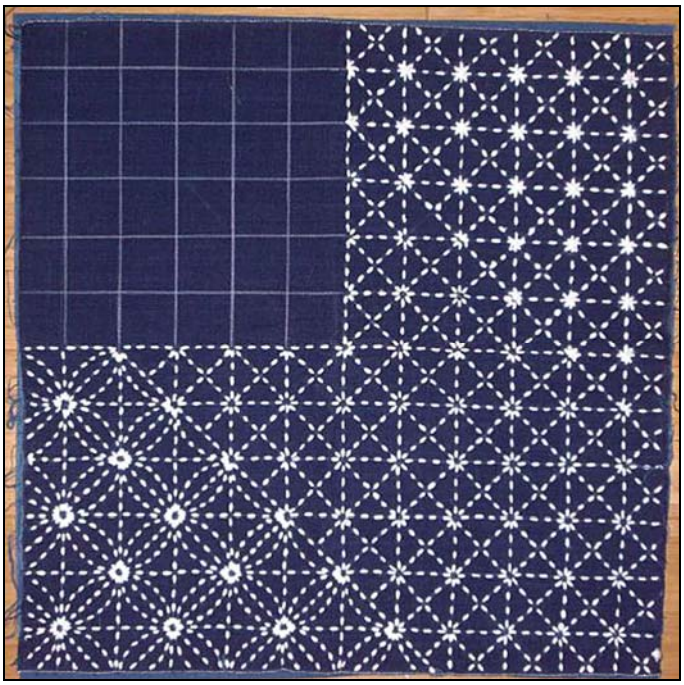


Figure 5(left). Chan-chan vest.
Figure 6 (right). Sampler.

Sashiko was practiced by the farmers, because sewing the parallel lines in crossing directions was a fast and efficient use of time; it was an effective means of reinforcing garments; and it was the most economic use of materials. In addition, the location of the stitching is determined by where the garment gets the greatest wear and tear.

The padded vest (fig. 5) would have been worn in the farmhouse sitting at the kotatsu, a quilt-covered table placed over a hibachi. The wear and tear of the vest would occur in the lap and sides as handwork was done throughout the winter months spent repairing small farming tools and implements.

The math in sashiko begins with the basic geometry of an underlying grid of parallel lines. The grid, in turn, determines how the patterns are sewn. The longest, most continuous parallel lines are sewn before shorter, connecting lines. The variations are innumerable. The more directions the lines cross each other the stronger fabric reinforcement becomes (fig. 6).

Examine intersections of stitches and note that some stop just before intersecting lines and begins just after the intersection. Also, notice in the top right corner how the stitches cross over the intersections. The number and placement of the stitches creates secondary patterns: holes or circles where the stitches yield to the intersection, and dots or flower-like motifs where the stitches cross over each other.

The handout (fig. 7) is provided to give you a visual explanation for how the underlying grid is sewn and the where the stitches are placed. Each segment of the grid has the same number of stitches, which are straight and even (fig. 8).

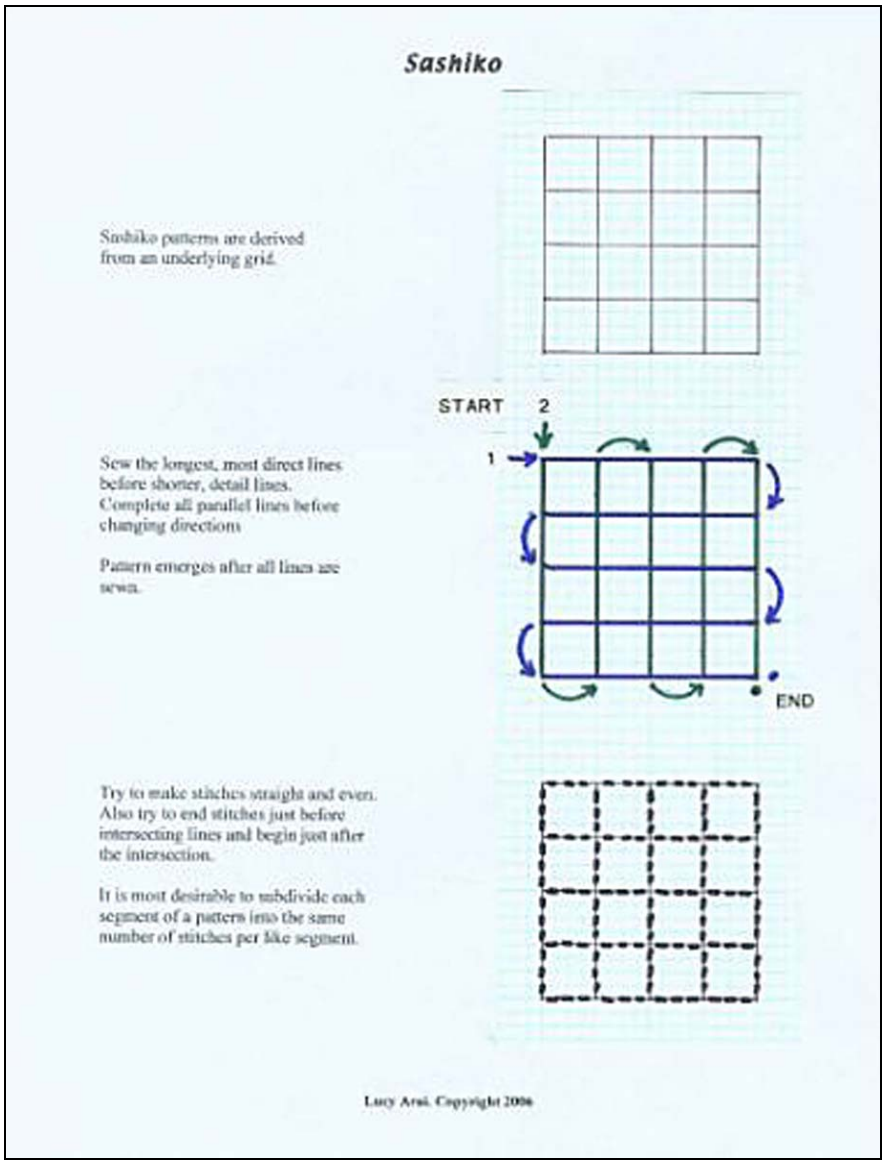
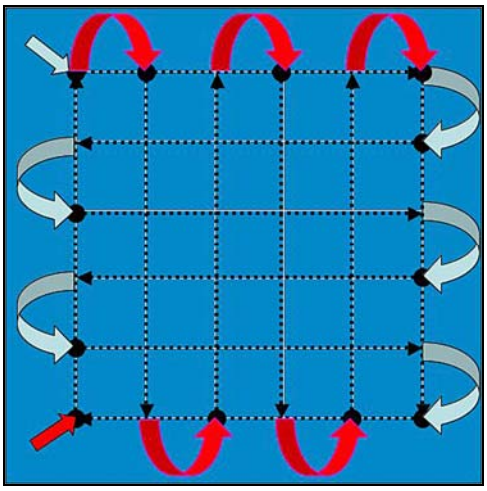


Figure 7. Sashiko workshop handout.

Working through the grid is done sequentially by sewing one direction of parallel lines first; then sewing the crossing set of parallel lines. The pattern emerges only after all the directions have been sewn.



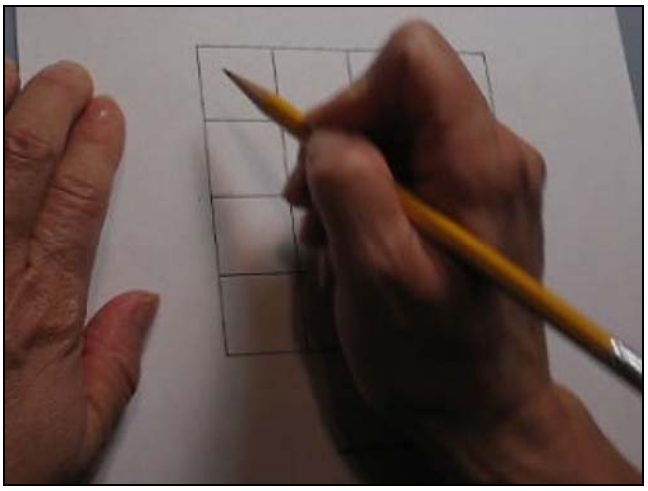
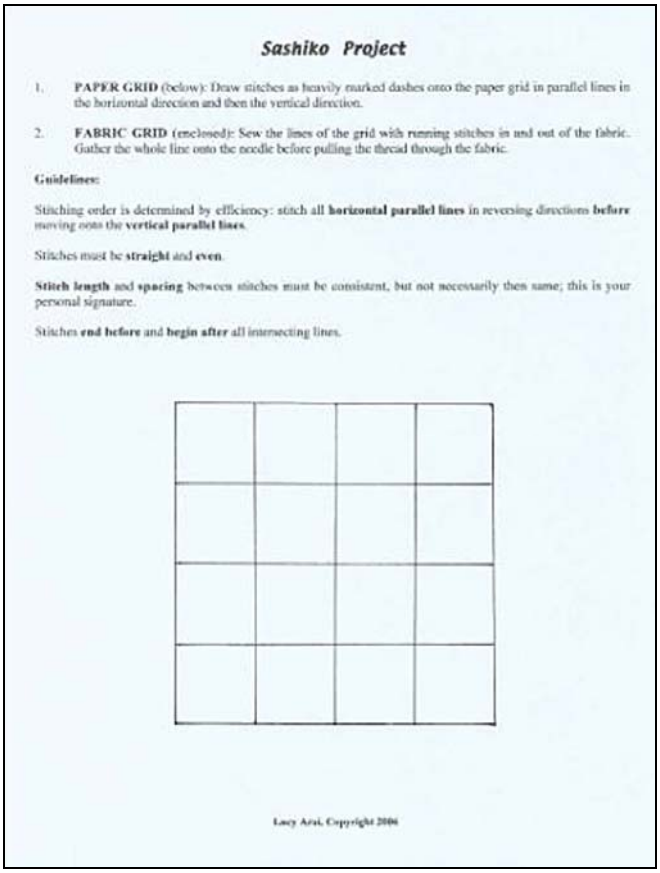


Figure 8 (left). Working through the grid.
Figure 9 (right). Drawing the dashes

There are two activities for this workshop:

1. Drawing the stitches into the paper grid.

2. Using the threaded needle, sewing the stitches into the grid marked on the cotton square.



Sashiko Project

1. **PAPER GRID** (below): Draw stitches as heavily marked dashes onto the paper grid in parallel lines in the horizontal direction and then the vertical direction.

2. **FABRIC GRID** (enclosed): Sew the lines of the grid with running stitches in and out of the fabric. Gather the whole line onto the needle before pulling the thread through the fabric.

Guidelines:

Stitching order is determined by efficiency: stitch all **horizontal parallel lines** in reversing directions **before** moving onto the **vertical parallel lines**.

Stitches must be **straight** and **even**.

Stitch length and **spacing** between stitches must be consistent, but not necessarily then same; this is your personal signature.

Stitches **end before** and **begin after** all intersecting lines.

Figure 10. Sashiko project.

You are not expected to complete the two activities during this session, however, you are asked to start them so that you can have an experiential appreciation for the relationship between math as a concept and math as a constructive part of textile production.

In the handouts, there is a page that looks like the one in figure 10. It describes each activity.

When you draw the stitches onto the grid (fig. 9), try to get a rhythmic cadence to the placement of your dashes as you work through the parallel lines.

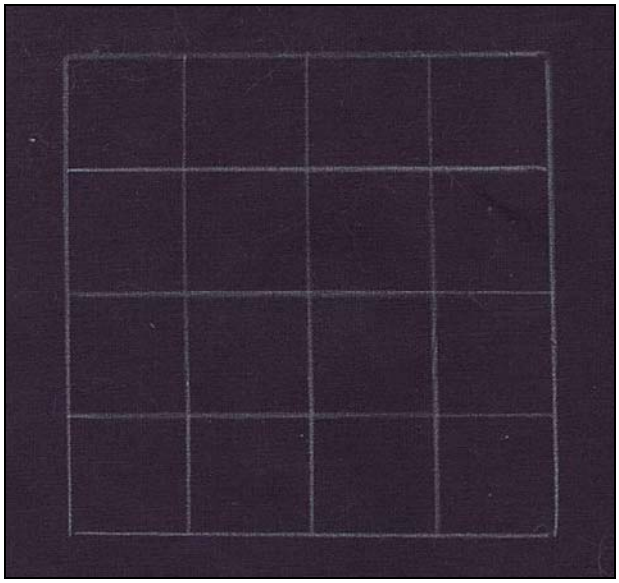


Figure 11 (left). Blue fabric with chalk grid.
Figure 12 (right). Sewing lines of stitches.

Figure 11 illustrates the piece of fabric in your kits. It has a threaded needle.

The video demonstrates the efficiency of sewing long, continuous lines by gathering as many stitches onto the needle as possible (fig. 12). In this case, a whole line is sewn before the needle is pulled through the fabric. Sewing in this way is fast, though a completed pattern does not emerge until all directions are sewn.

Figure 13 shows what the completed square will look like from the front. Figure 14 shows what it will look like from the back.

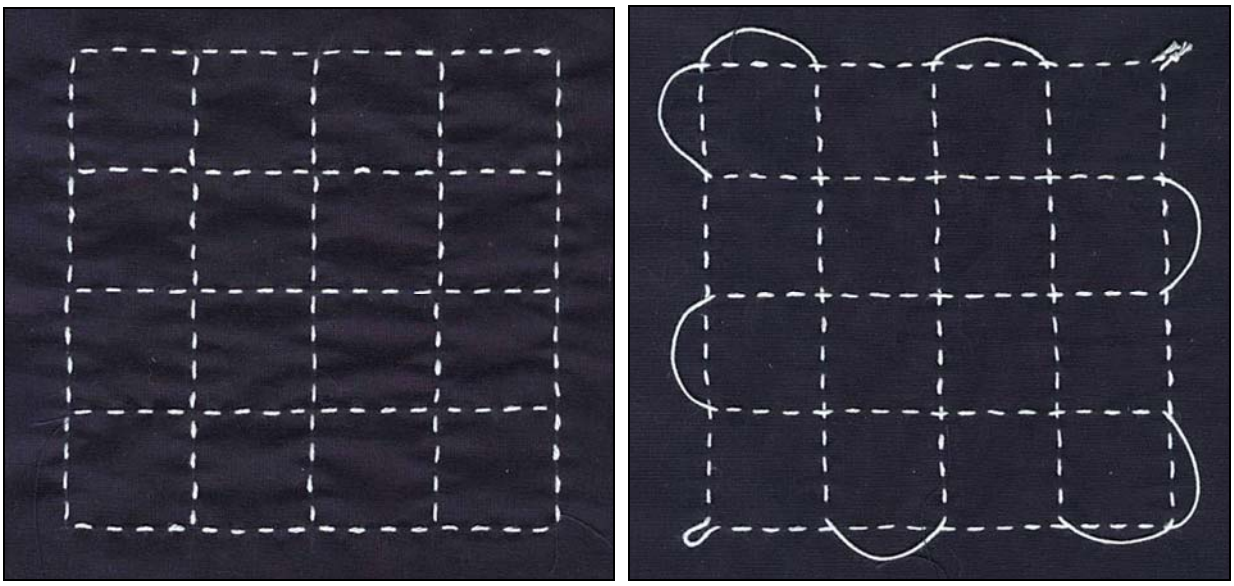


Figure 13 (left). Completed blue fabric – front.
Figure 14 (right). Completed blue fabric – back.

The threads float from one line to the next parallel line, and the beginning and end of the course are in the same corner.

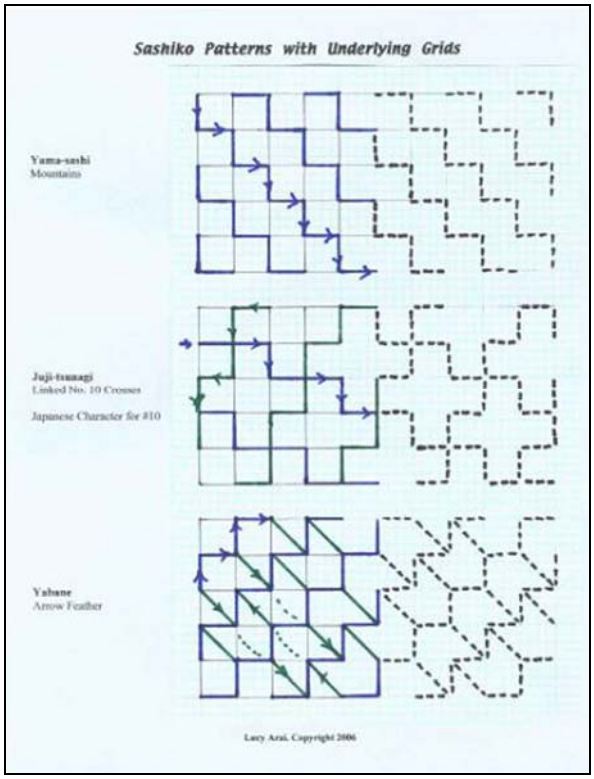


Figure 15. Sashiko patterns with underlying grids.

The handout in figure 15 illustrates a variety of ways the grid can be interpreted. The order and direction of sewing is marked by arrows moving in opposing directions.

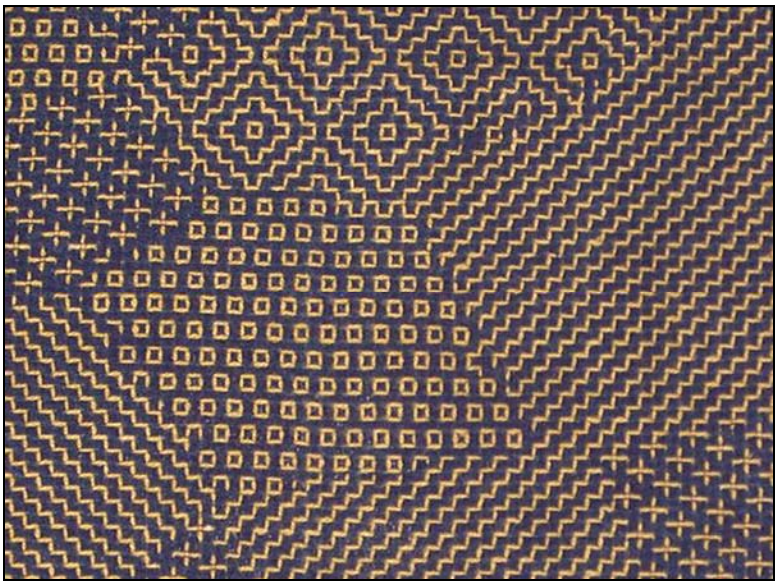


Figure 16. Hitomaezashi (one-stitch sashiko).

The placement of stitches in relation to one another has the potential for innumerable pattern variations. In Hitomaezashi (fig. 16), each stitch is a segment of a design motif repeated across the fabric. It is sewn in horizontal parallel lines, then in vertical parallel lines. The outcome when completed is a visual patchwork of different patterns.

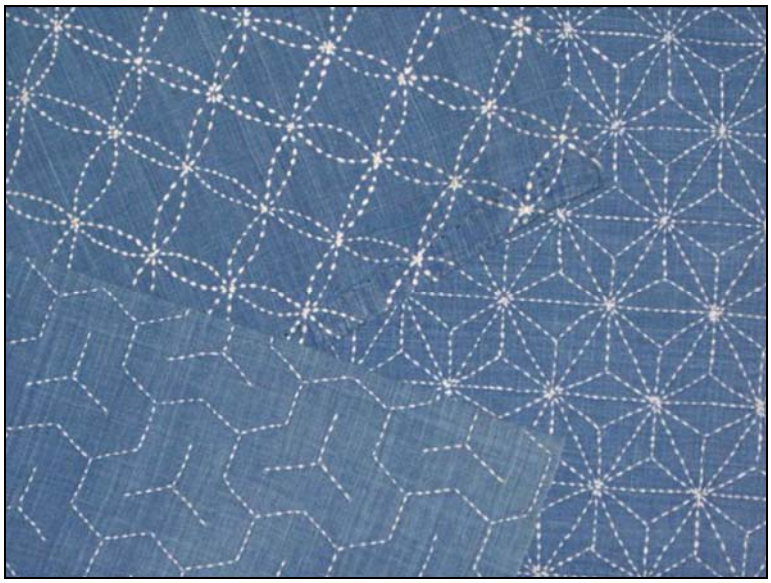


Figure 17. Hanten, detail.

Sashiko patterns are inspired from nature and created through geometry. Sashiko is a tradition that connected generations of families and its structure embodies the relationship of textiles and math.

The underlying grids of sashiko patterns are fundamental geometry, and are the reinforcing structures that strengthen and quilt garments of everyday life. In sashiko, we can see math emerging from textiles.

Figure 20. Diptych by Lucy Arai. Courtesy of Lucy Arai.

Math defines sashiko through the geometry of patterns. Explorations into the relationships between textiles and math push tradition and necessity into a dialogue with creative potential. Sashiko and the process of stitching patterns exemplify the relationship between math and textiles. It is clear that textiles are the embodiment of math.