

Indigenous Algebra

Kayshish Pichette-Cline

Matteo Tamburini

Xwlemi Elh>Tal> Nexw Squl

<http://www.nwic.edu>

About us

- **Matteo:** I was born and raised near Florence, Italy. My father was Italian, my mother is a descendant of Irish settlers to the Dakotas. I live in the traditional homeland of the Lhaq'temish and other Coast Salish people, in the city of Bellingham, Washington, and have been teaching Mathematics at Xwlemi Elh>Tal> Nexw Squl for over a decade.

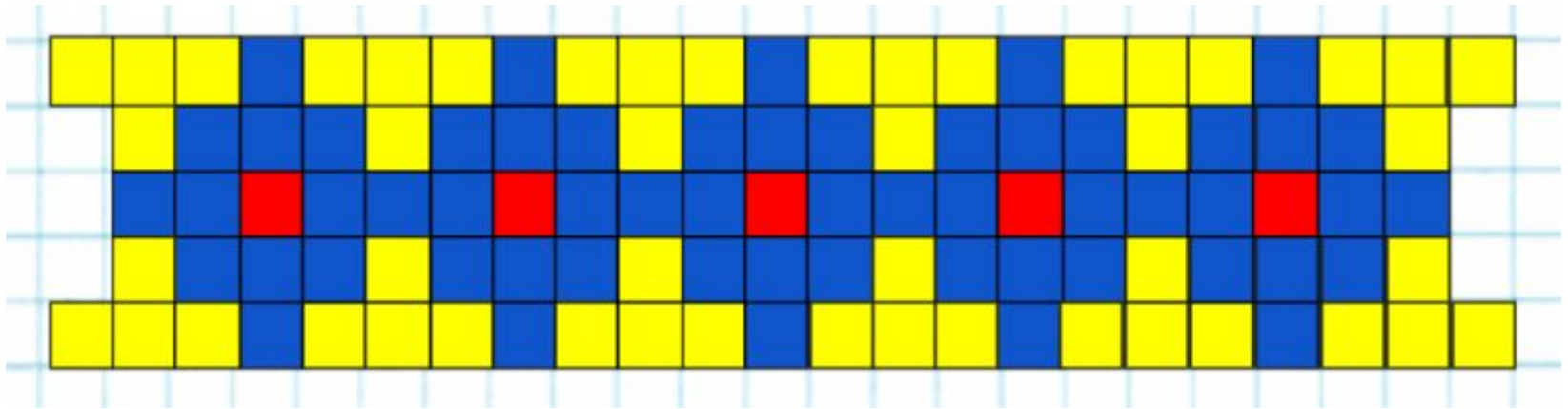
<https://tinyurl.com/22me6dxn>

- **Kayshish:** I am from the Nooksack Tribe and Lummi Nation. I am currently enrolled at Western Washington University (located in Bellingham, Washington) in the mathematics program. I am also Xwlemi Elh>Tal> Nexw Squl Alumni, I have been a math tutor at NWIC for 3 years, I have also taught elementary algebra a couple times.

Some of our patterns, and some of the patterns shared by students

The Math faculty Xwlemi Elh>Tal> Nexw Squi have been collecting a variety of algebraic patterns from students, based on cultural practices like beading and weaving. They are used extensively in our algebra classes.

Alanna's pattern



The picture above has 5 diamonds in it.

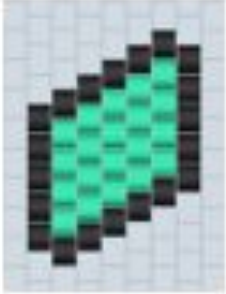
How many beads does it take to make this pattern if there are 2 diamonds?

What about any number of diamonds?

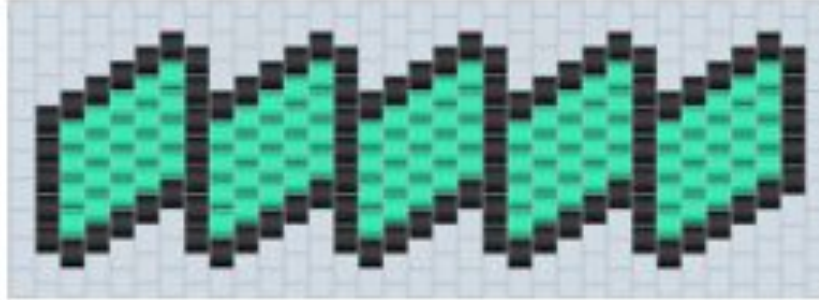
© Alanna Jones (Navajo, Zuni, Comanche, Kiowa, and Sac & Fox), 2021

I looked at a couple of my grandma's old beading patterns that she had gave me and that's how I came up with this, and 'cause I'm part Comanche I used the Comanche colors which are blue, red and yellow. Alanna Jones, 2021

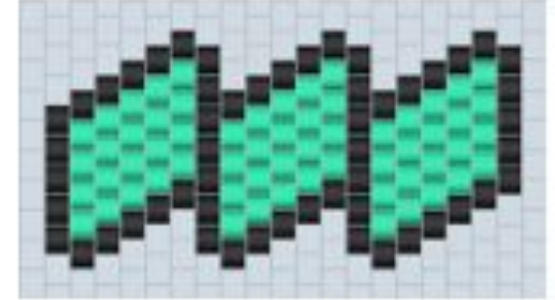
George's prayer fan



One diamond



Five diamonds



Three diamonds

How many black beads would it take to make this pattern if there were 13 diamonds?

What about any number of diamonds?



In my math course, I was given examples of how algebraic thinking was used by many Indigenous people, and how I can utilize those same aspects in thinking. One of the most profound examples of this was in one of my final assignments. I was able to articulate and understand the peyote stitch on my late father's prayer fan that was passed onto me.

Ashley Bell, 2022

Photo © Ashley Bell, 2022



Mehoy'



The side of the central square (the bottom of the basket) has a width of 4 strips. After securing the square, each strip gets cut in half, and two cross-pieces are added.

How many total 'fingers' in the picture above?

What if the basket was made with a side of 3 strips? Or 7 strips? Or n strips?

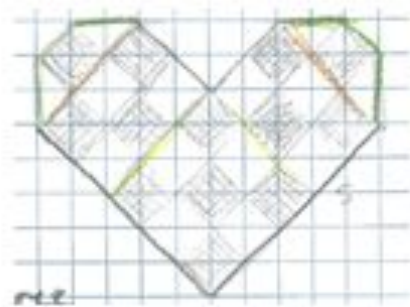
© NWIC, 2019

Disclaimer: the author does not claim copyright to the practice of weaving with cedar, any of the individual words, or to this particular design.

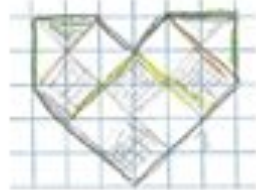
The author retains copyright of the images and questions related to them as presented in this document.

Developed by Smak i'ya' [Matt Warbus] (Lummi) and Matteo Tamburini

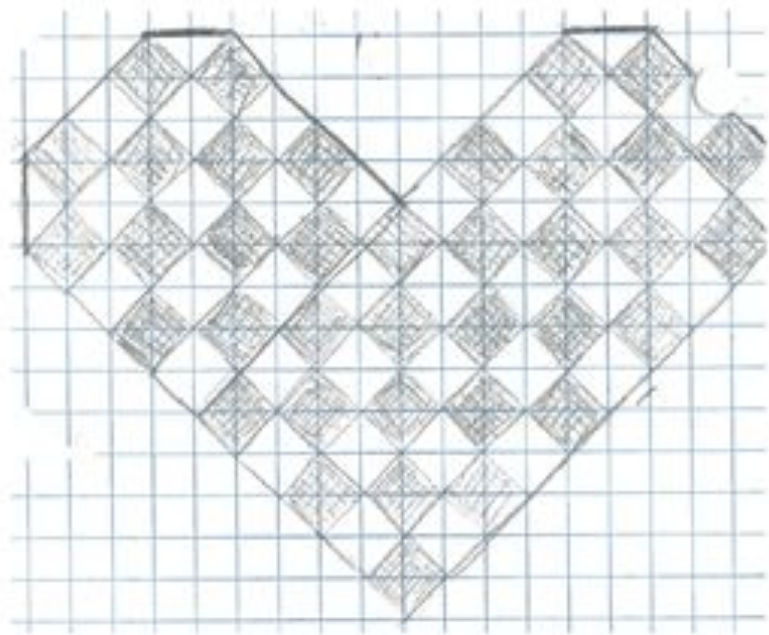
Cedar hearts



Size 2



Size 1



Size 4

What would the total area of a Size 10 heart?

What about a heart of any size?