Non-Linear Storytelling Through Rotational Symmetry

A Grade 7 Project

By Janelle Findlay

https://canadianart.ca/news/susan-point-wins-30k-audain-prize/
I would like to acknowledge that the work I did for this project was situated on the unceded traditional territories of the xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish), and səl̓ilwətaɁ (Tsleil-Waututh) Nations.
In 2004, Vancouverites were invited to design the city's storm sewer covers. The competition invited anyone who lived, worked, or went to school in Vancouver to submit design ideas for new storm sewer covers, the lids that mark the entrances to our underground network of sewers.

The Public Art Program received more than 640 entries from Vancouverites of all walks of life and ages.

These were the top 36 entries.

http://former.vancouver.ca/commsvcs/oca/publicart/artunderfoot/index.htm

Finally, art you can drive over

Council to debate beautifying city's manhole covers

BY AMY O'BRIAN
VANCOUVER SUN

Vancouver's dirtiest, dankest places may have a little beautification in their future. Following the lead of cities such as Seattle, Calgary and Kyoto, Vancouver's city council will vote Tuesday on whether to put in motion a plan to decorate the city's sewer access covers. It's too early to know how the heavy lids that separate pedestrians from the underworld will be decorated, but Bryan Newson, manager of the city's public art program, said the design choices will likely have an aspect of environmental awareness to them.

In addition to increasing the "interest and aesthetic of the city in a small and subtle way," the sewer access covers — often called manhole covers — will likely be incorporated into a public awareness campaign about fish habitats and water pollution.

Newson said the project is expected to have a one-time design cost of $20,000, which awaits council's approval on Tuesday and will come out of a $250,000 public arts fund and possibly the city's sewer capital.

Once the metal covers are designed and cast, it is projected to cost an additional $9,000 per year to include artwork on the lids.

The city's engineering department already spends about $94,000 per year buying new and replacing covers. And grants, and so additional cost would be covered by sewer capital, which Newson described "as millions and millions of dollars."

"So this seems to us like a modest expenditure. We think it'll go a fair way at it is good value," he said.

Most engineering projects, including sewer access covers, have about a 100-year lifespan, and Newson said the idea at these artworks might be around in the next century is part of the appeal of the project.

Councillor Tim Louis is enthusiastic about the idea of decorating the sewer lids, even if it may sound a bit odd to some members of the public.

"I cannot think of a better use of sewer money than to create a bit of art. It's kind of ironic, isn't it?" Louis said.

"This is a very creative way — at no expense to the taxpayer — of putting a little bit of colour, a little bit of art into our world."

It's unlikely any vibrant reds or blues will be incorporated into the designs, but Newson said nothing is finalized yet.

It's not yet decided whether the covers will be designed by professional artists, amateurs or students, and Newson said the number of different designs that will be accepted by the city is still up in the air.

He noted that winning designers will have to meet certain engineering and technical requirements to ensure they are safe for pedestrians and vehicles.

Councillor Peter Ladner, who sits on council's minority Non-Partisan Association slate, supports the idea, but said the timing of the report is a bit inappropriate. On Tuesday, property tax increases of up to 2.5 per cent are on the same agenda as the sewer lids.

"In theory I don't have a problem with it, but I just find the timing is awkward given that we're wrestling over this budget," Ladner said.

"I've always admired the manhole covers in Seattle that are decorated."

Ellen Woodworth, a councillor with the Coalition of Progressive Electors, said she believes the project will prove to be money well spent.

"I think we're trying to make Vancouver a fun, artistic city," she said.

"This is just one way to liven up the city."

Calgary sewer access cover. Vancouver may do something similar.
Wait a minute, what is a manhole cover?

**Manhole cover**

From Wikipedia, the free encyclopedia

A **manhole cover** or **maintenance hole cover** is a removable plate forming the lid over the opening of a **manhole**, an opening large enough for a person to pass through that is used as an access point for an underground vault or pipe. It is designed to prevent anyone or anything from falling in, and to keep out unauthorized persons and material.

Manhole covers date back at least to the era of ancient Rome, which had **sewer** grates made from stone.

https://en.wikipedia.org/wiki/Manhole_cover
The Public Art Program received more than 640 entries from Vancouverites of all walks of life and ages.

These were the top 36 entries.

Look closely, what stories do you hear?

Where do we see math in these designs?

https://www.ironcladart.ca/competition/examples.php
If we were to take a pin and place it in the center of these designs, can we see rotational symmetry in these?

Which designs stand out for you?

How might artists use rotational symmetry to tell a story?

Which designs might share similar properties?

https://www.ironcladart.ca/competition/examples.php
Coast Salish (Musqueam) artist Susan Point and her daughter Kelly Cannell were one of the winners of the contest.

What story might Susan Point and her daughter be sharing through this design?

Why four frogs? Why include the eggs, tadpoles, and adults?

Choosing a design that is from the natural world highlights that the industrial world and the natural world can live in synergy.

https://www.ironcladart.ca/competition/examples.php
Susan Point is a Coast Salish artist from Musqueam, a First Nation in Vancouver, British Columbia.

Let's visit two websites to admire her work.

https://susanpoint.com

Susan’s distinct style has stimulated a movement in Coast Salish art. She draws inspiration from the stories of her ancestors and commences the use of non-traditional materials and techniques, therefore inspiring a whole new generation of artists.
“When I design and work on a piece, regardless of medium, there are countless stories, thoughts and memories that go through my mind,”
“I feel it is important to re-establish our Salish footprint upon our lands, to create a visual expression of the link between the past and the present that is both accessible and people-friendly. I create unique original artworks that honour my own people as well as the diverse groups of people from around the world who have come to live upon our lands in the Northwest Coast. My hope is that my art leaves a lasting impression on locals, visitors and surrounding communities.”

How does her Spindle Whorl Tell a Story?

Flight [Spindle Whorl]
Year: 1995
Artist: Susan Point
Dimensions and materials: Red cedar | 4.8 m in diameter
Terminal: International
Level: Level 3
Security Access: After Security

“Flight” is the world’s largest Coast Salish Spindle Whorl and relates to the large-scale weavings included in this contemporary art installation. The artwork is presented in a setting of water and stone, symbolic of this land. The spindle whorl uses traditional images to depict the theme of flight. The eagle, which is considered a symbol of power, is designed around the image of a man whose arms are raised, welcoming visitors and also gesturing flight. On the chests of the men are salmon motifs to represent the Coast Salish people, who still live and fish along these shores.

Coast Salish Artist Dylan Thomas from Lykson First Nation and Rotational Symmetry

Play video:
https://www.youtube.com/watch?v=Nd_ZXEZY30I&feature=youtu.be&ab_channel=BurnabyArtGallery
Non-Linear Narratives

- Traditional Indigenous stories, including Métis ones, generally have non-linear narratives and, unlike European stories, many of them have no real beginning, middle or end.
- Métis stories are often ongoing and can be carried over through time.
- The stories are layered and have multiple meanings, so people of varying ages will be left with different interpretations.

https://indigenouspeoplesatlasofcanada.ca/article/oral-tradition/
Task:

Let’s Time Travel back to 2004 and Enter the Storm Sewer Cover Contest.
Let’s use Rotational Symmetry.

We will learn a technique on the next slide to guide our Rotational Symmetry design.

How will you tell a story with your design?
Let’s watch this video.

This is how you will create your rotation symmetry.

The artist here is using eight slices.

How many slices will you need to tell your story?

Play video: [https://www.youtube.com/watch?v=DrOItPK4zGE&ab_channel=i%E3%80%883math](https://www.youtube.com/watch?v=DrOItPK4zGE&ab_channel=i%E3%80%883math)
Questions

Choose how many times you would like your core slice to rotate around the circle. Perhaps it is intentional—eg) four slices for four seasons,

What options do we have for how many even slices may go into a circle?

What do we already know about degrees in a circle?

Are some amounts of slices “friendlier” than other amounts?
Together, let’s explore circle properties...

<table>
<thead>
<tr>
<th>Number of Slices or Rotations in the Circle</th>
<th>Calculation</th>
<th>Let’s Slice Up the Circle Together</th>
<th>Each Slice will be: (in degrees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Slices</td>
<td>360 degrees/ 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Slices</td>
<td>360 degrees/ 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Slices</td>
<td>360 degrees/ 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Slices</td>
<td>360 degrees/ 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Slices</td>
<td>360 degrees/ 10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Is there an amount of slices that may be trickier?
Materials

- Protractor and previous protractor skills
- Ruler
- 2 circle sheets
- Scissors
- Pencil
Procedure

- Decide how many slices in your circle.
- Calculate the angle of one slice.
- Use one of the circle sheets and your protractor to measure the one prototype slice. Cut it out.
- Take time to plan your design. Do you have a story to tell? How do you connect with the city of Vancouver? Design with pencil.
- Use the carbon transfer technique to design the rest of the circle or manhole cover on the second circle sheet.
- Color
- Notice symmetry and rotations
- Write an artist statement of minimum 4 sentences long. See next slide.
Minimum 4 sentences long.

Give your design a Title.

Include one sentence about how you chose the design that you did, or its meaning.

Include two sentences about how math guided your process. How did your understanding of circle geometry allow you to create your image (include words such as angles, clockwise or counter-clockwise and symmetry).

Finally, include one sentence about what emerged for you in your art, or what stands out as neat, noteworthy, or significant. Alternatively, you may reflect on what you may do differently next time.
Student Exemplars
"Collection."

This is my take on transformation art. Each aspect of the piece represents something that's been in my life, either currently or in the past. The two green circles, for example, are a simplistic drawing of rhythm, gymnastic apparatus. Specifically the ball, which was what I enjoyed using the most during my six years of gymnastics. There's also eight-number tree's in each section, it was my favourite number, and "888" is also an angel number.

For the black triangles, it was a recap of the many triangular drawings I made when I was younger. Above that, two dark blue row-like shapes appear. This is actually a modified version of my zodiac sign, the Aries. Above these, to a lighter blue wave design. I've also enjoyed water and the ocean, so I decided including it would be a good idea. Lastly, there's two rows being reflected across an invisible line of symmetry. As a child, being rotated was something I fantasized about, much like every other child. Including these rows reminds me of the yellow paper crowns I made back then. Overall, there are many transformations here. The two circles, for example, are translations. The numerous triangles can also be seen as a translation, as they move to the right. But two new symbols are reflected across the plane, and so are the names using the same or similar lines of reflections. The two yellow crowns are reflections as well, but with a different line of reflections giving the opposite one of our other two reflections. This whole piece is a collection of my understanding of transformations, and of my hobbies and personality.
Leaping Salmon

The main reason I chose to create a piece showing the life of a salmon is a rotation of 90° and because there are fish swimming in a river and on a stream, a salmon lives four years. The reason behind the term leaping salmon is that when you hold your finger down on the point of origin and rotate it by 90° clockwise, it creates an illusion that the fish are leaping. This is of cultural importance to me because I am Canadian, and one of the most recognized natural resources in the salmon. Within my art, there is a rotation to a rotation, where each quarter of the image is rotated by 90°. Also, the text is a discrete translation where if you rotate each quarter of the image 90° clockwise, you can see that within each quarter the top becomes a bottom from the point of origin are maintained.
my Life's Tapestry

My Life's Tapestry – Reflections, Reflections & Thanksgivings

When making my design, I started by commemorating events of my life that have a significant meaning to me. For example, I included the Star of David with numbers on it, representing my Jewish heritage. In addition to the Star of David, I placed the word 'love' on the outer circle of the design. I also created a circle with the Hebrew symbol for 'life' to symbolize the preciousness of life. I added a bird in flight to represent freedom and aspiration. I included bread loaves to represent sustenance and a path to success. I placed the number 180 in the middle to include all the people who have contributed to my life in some way. Finally, I included the colors of the rainbow to symbolize my hope for the future. I also included a rainbow on the bottom to represent my love for creation. I also included the words 'enjoy your journey' to remind me to enjoy the journey of life.

In addition, I included a design that represents my personality. I chose a design that is colorful and vibrant, with a variety of shapes and colors. I included a design that is simple and elegant, with a variety of shapes and colors. I also included a design that is complex and intricate, with a variety of shapes and colors. I included a design that is reflective and introspective, with a variety of shapes and colors. I included a design that is creative and innovative, with a variety of shapes and colors. I also included a design that is whimsical and playful, with a variety of shapes and colors. I included a design that is expressive and emotional, with a variety of shapes and colors. I included a design that is spiritual and meditative, with a variety of shapes and colors. I also included a design that is practical and functional, with a variety of shapes and colors. I included a design that is perspective and unsophisticated, with a variety of shapes and colors. I also included a design that is perspective and unsophisticated, with a variety of shapes and colors.