Creating Mathematical Experiences in studio and outdoor spaces for all learners

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Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving.

Connect mathematical ideas to each other and to other areas and personal interests.

Engage in problem-solving experiences that are connected to place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures.

Incorporate First Peoples worldviews and perspectives to make connections to mathematical concepts.

a selection of BC Mathematics Curricular Competencies
Connections

- math to self
- math to world
- math to math
PLAY

- playing with materials
- playing with language
- playing with ideas
in The Studio
How do art materials inspire children to play with mathematical ideas?

“My Grandpa has one of those.”
Grauer Grade 1 student

What materials bring children together to learn with each other?

“THIS ONE IS JUST LIKE ME!”
-Grauer Grade 2 student
What is math?
Vision for The Studio

A space to re-imagine the teaching and learning of mathematics through an inclusive, flexible learning environment that offers choice of materials to consider mathematics through the aesthetic dimension.
for educators

- to disrupt thinking about mathematics teaching and learning
- to learn about the affordances of different materials
- to consider how the environment can support thinking and learning

- to learn more about instructional approaches that focus on deeper learning, inquiry and place-based and culturally responsive pedagogies
- to consider ways to teach mathematics more holistically, weaving together elements of our curriculum framework

for students

- to have opportunities to experience math to math, math to self and math to world connections
- to have choice in where they choose to learn, the materials they use and how they share their thinking and learning and what projects they might take up
Teaching and Learning Through a Mathematical Big Idea: Decomposing
Connecting Big Ideas

- Identity
- Story
- Place
- Community
- Relationship
- Connection
- Decomposing
- Change
- Transformation
- Equivalence
- Space
- Pattern
What is decomposing?

How might these materials help you think about decomposing quantities and shapes?
Investigating Snowflakes

playing with ideas of size, shape and symmetry
Questions to support student inquiry

- What stories live in these shapes?
- What is the relationship between 2D and 3D shapes?
- How can you combine shapes to make new shapes?
- What shapes live in this shape?
- How do shape and size help you make a map?
- How does visualizing help you make sense of the world?
connecting our thinking about size, shape and symmetry
Investigating Circles:
Communicating our Thinking

Investigating Circles
Why are circles so important?
How are diameter and circumference related?
How can I draw circles with a compass?
How can we measure circles?
How can we use circles to create and build with?
Thinking about the Circle:
Where does math live in Susan Point’s spindle whorl art?
Investigating the Art of Susan Point

- Grades 3&4
  - Develop, demonstrate and apply mathematical understanding through play, inquiry and problem-solving
  - Engage in problem-solving experiences that are connected to place, story, cultural practices, and perspectives that are relevant to local First Peoples communities, the local community and other cultures

- Grade 4
  - line symmetry

*Can you identify line symmetry in Susan Point’s art?*

*Can you create a design inspired by Susan Point that has line symmetry?*
Coast Salish Art
shape elements

- circles
- crescents
- curved triangles
- frog
- salmon
- symmetry
- environment
What local artists or pieces of art might inspire mathematical thinking?
What connections are you making to your context?

► Think of a mathematical big idea or concept and consider materials or investigations that might support connection-making for your students.

► What kind of studio-like experience could you provide for your students?
Place-Based Learning

Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).

How might the teaching and learning of mathematics be more holistic?

How might a sense of place be nurtured through the teaching and learning of mathematics?
place as provocation
What do you notice?
What do you wonder?
What math lives here?
In the forest...
Numbers in our Community

photographs taken by the grades 1&2 students in division 9, Byng Elementary
When I look at the boats, I wonder how they know where the fish are? Which way do the waves go? I wonder how they catch the fish? How fast can the boat go?

How does this picture inspire you to think of the story of this place? What stories live in this river? What connections are you making?
How does this picture inspire you to think of the story of this place?
What stories live in this river?
What connections are you making?

About how many boats can you see?
How heavy is a tuna fish?
How many fish are you allowed to catch?
If a fish weight two kilograms and it cost $6 and I bought 24 fish, how much would that cost?
Where does mathematics live in this place?

What mathematical story does this place tell?
Place-Based Mathematical Inquiry: Where can we see and create math?

- Garden City Elementary
starting points...

- Go outside –
  - What do you notice?
  - What do you wonder?
  - Where do you see _____ ?

- Use visual images
  - photographs, art, maps

- Use authentic natural materials
#OutdoorClassroomDay

OUTDOOR CLASSROOM DAY

7 NOVEMBER 2019

SIGN UP!

UPCOMING DATES
21 MAY 2020

THE OUTDOOR CLASSROOM DAY MAP

Sign up to put your school on the 2019 map and join the global movement!
To see where the 3.5 million children got involved in 2018, check out the 2018 map here.
#100LeavesChallenge

james brunt artist @RFJamesUK · 5d
Wonderful #100LeavesChallenge play at @Grauer_Phoenix

Janice Novakowski @jnovakowski...
Beginning the #100LeavesChallenge with grades 1&2 at @Grauer_Phoenix - how will you know that you have 100 leaves? @RFJamesUK #BCAMTreggio #sd38learn
Outdoor Artists

- Andy Goldsworthy
- James Brunt (Twitter @RFJamesUK)
What opportunities might you create for outdoor learning?

What places and spaces might you find to uncover mathematics with your students?
creating a new narrative for mathematics

- “Math is beautiful.”
- “Math is fun.”
- “There are many ways of making math.”
What math lives here?
uncovering mathematics in
studio and outdoor experiences

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