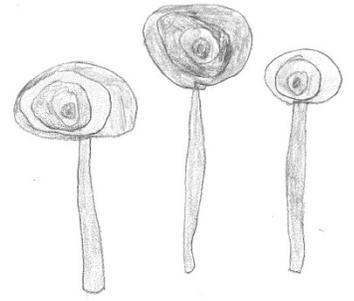


Storytelling and Math

Janice Novakowski



Storytelling creates an opportunity for students to make meaning of mathematics through making connections.

“connect mathematical concepts to each other and to other areas and personal interests”

~BC K-12 Mathematics curricular competency

Making Connections

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

What openings are you creating in your classroom for students to make connections?

“Learning is embedded in memory, history, and story.”

~First Peoples Principles of Learning, FNEESC

“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”

~BC K-9 Mathematics curricular competency

In their book, *Teaching Mathematics as Storytelling* (2009) SFU Mathematics Education professors Zazkis and Liljedahl examine the role of storytelling in the mathematics classroom, with the teacher in the role of storyteller. They define a story as having conflict and a structure and examine specific elements of a story:

- plot
- conflict
- images
- human meaning
- the sense of wonder
- humor
- patterns

“stories make us feel”

~Zazkis & Liljedahl, 2009, p. 3

*How does a personal or emotional connection to story shift our engagement or meaning-making?
How might a more personal and open approach to “story or word problems” support students’ learning of mathematics?*

Zazkis and Liljedahl (2009) also consider story types, as pertaining to the kind of engagement with mathematics that the story brings:

- stories that set a frame or background
- stories that accompany or intertwine
- stories that introduce
- stories that explain
- stories that ask a question
- stories that tell a joke

“We tell stories in the mathematics classroom to achieve an environment of imagination, emotion, and thinking. We tell stories in the mathematics classroom to make mathematics more enjoyable and more memorable. We tell stories in the mathematics classroom to engage students in a mathematical activity, to make them think and explore, and to help them understand concepts and ideas.” (page ix)

What might it mean for students if they told their own stories?

Storytelling creates opportunities for students to contextualize mathematics in a way that is authentic and meaning-making for them. Embedded in a story that has a mathematical focus is some sort of action or problem. A story may involve actions such as students combining or decomposing quantities, counting, comparing quantities or sizes, measuring, or transforming shapes by composition or position. A story may also have an inherent conflict or problem that needs to be resolved or solved.

“Supporting children to pose problems for themselves as they engage in play or other activities is mathematically productive and often leads to the creation of problems that children care about and understand.”

Young Children’s Mathematics: Cognitively Guided Instruction in Early Childhood Education (2017), p. 110

Starting points:

- ⦿ puppets – playful math such as give & take, sharing, build & change
- ⦿ role-play – problems from everyday life such as setting the table
- ⦿ small world play – using characters and setting to inspire and play out math stories
- ⦿ counting collections
- ⦿ problem structure or concept
- ⦿ children’s books –collections of concept books and stories

What pedagogical structures and contexts create opportunities for students to pose problems and tell math stories?

Problem Type Inspiration

After unpacking a problem together and students sharing their strategies for solving the problem, invite students to pose similar problems or tell stories using the same problem type or mathematical structure. This creates an opportunity for students to use a number range that is comfortable for them and to infuse their problems with contexts that are personally meaningful.

Provocations

What stories live in these numbers? What stories live in these equations?

By providing open-ended questions and materials to provoke thinking and investigation, students make connections, create meaning and engage in sense-making as they consider quantity, mathematical structure and relationships.

Mathematical Picture Book Inspiration

Read a mathematical picture book to provide inspiration for problem structure and story context. Orally discuss and share strategies for solving the problem/s embedded in the story. Invite students to develop their own mathematical stories with a problem included.

Mathematical Storytelling

Drawing upon experiences with playful storytelling in our classrooms, students are often asked: *What stories live in these materials? How might these materials help you tell your story?* By introducing math tools, numerals and other collections to our storytelling materials, what mathematical stories and problems might students share?

Counting Collections

As a way to extend the routine of counting collections, ask students to consider how their collections might inspire mathematical problems and stories. Students may use the item as inspiration, the method of counting or the quantity as starting points for their problems and stories.

“There are advantages to having the children solve problems that emerge out of a collection they have already counted. When the children have counted the collection, they have developed a context for understanding of the quantity in the collection. They essentially understand the context in which the problem is situated, and they have actually started to solve the problem by constructing the collection that is its starting place.”

Young Children’s Mathematics: Cognitively Guided Instruction in Early Childhood Education (2017), p. 50

Picture books to inspire problems and stories involving change in quantities:

Splash! by Ann Jonas

One Duck Stuck by Phyllis Root

Quack and Count by Keith Baker

Counting on Fall by Lizann Flatt

Picture books to inspire sharing problems and stories:

The Cookie Fiasco by Dan Santat

The Doorbell Rang by Pat Hutchins

Bean Thirteen by Matthew McElligott



Picture books to inspire problems and stories involving decomposing and composing quantities:

Ten Black Dots by Donald Crews

12 Ways to Get to 11 by Eve Merriam

Picture books to connect to counting collections:

Hannah’s Collections by Marthe Jocelyn

Two Ways to Count to Ten by Ruby Dee

What in the World? Numbers in Nature by Nancy Raines Day

Great Estimation by Bruce Goldstone

Greater Estimations by Bruce Goldstone

Amanda Bean’s Amazing Dream by Cindy Neuschwander

Provocations to inspire mathematical storytelling:

What math stories can you tell?

What stories live in these materials?

What stories live in numbers?

What stories live in these equations?

How can you use shapes to tell a story? How do the shapes give you ideas for your story? How can you compose and decompose shapes to give you new ideas?

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