

Narrative & Math in the Junior Grades: Snapshot of an Integrated Unit

By: Peyton and Aneel

Big Idea → Community and Belonging

Key Concepts:

Distance (From steps to kilometres!)

Why do people move?

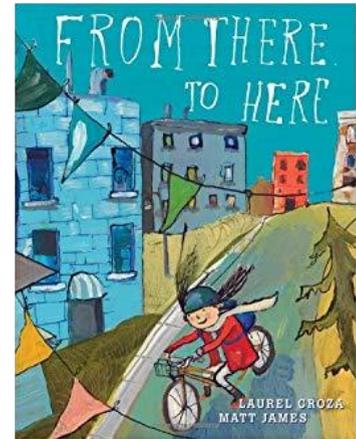
How are environments different?

Example Math Lesson 1 - Robot & Controller

- Students on centre of field, split into pairs
- Indicate Cardinal Directions (NESW)
- 1 Robot, 1 Controller
- T-Chart & Small Object
- Controller puts their object somewhere on the field. They record an estimate of how many steps it will take their Robot to get the object.
- They give the Robot instructions to get to the object.
- “Go East 10 steps, turn south and walk 5 steps...”
- Controller records their instructions on T-chart (Cardinal Direction/Steps)
- **Switch roles.**



Narrative for Success Criteria: “Robots run out of energy, so don’t put your item far away! Robots love to move - they don’t want to be stuck doing nothing! Think about more than 20 steps altogether.”



From There to Here by Laurel Croza and Matt James is a story about a young girl’s coming-to-terms with her family’s relocation to Toronto from Saskatoon.

NEXT STEPS? This is the 1st part of a unit leading into a culminating activity (outlined on back). The next steps include getting students to estimate steps in relation to metres, exploring maps of their neighbourhood, a real-purpose measurement trip to the local library - all interspersed with Social Studies and Literacy lessons.

Why Math and Narrative?

Narrative is everywhere in our lives. We live and breathe stories, and our stories help us make sense of the world. Children come to understand the world they live in from the stories we tell them. They come to value and wonder about certain things, through the stories that appeal to them. Why not make math part of the great lexicon of narratives that help them understand the world? There is a dearth in Junior grade instruction with picture books and engaging mathematics.

Traditionally, math education becomes more sterile as students get older. The joy of making meaning and exploring in real-contexts is replaced by repetition, calculations, and rote problem solving. Narrative is a bridge between engagement and creativity in math. We want students to explore and make meaning of their world through math. Math is everywhere in our lives.

Culminating Activity:

Students will be invited to plan a road trip somewhere in Canada. This activity would allow students to explore a variety of different mathematical concepts, and has the potential to support cross-curricular learning. The final product could include the following components:

- A detailed map of their journey
- Information about distances (How far is it from home? How long will it take to travel there?)
- Extension for Grade 5 / 6: Information about the cost of the trip (Where will you stay? How many times will you need to fill the car with gas? What kind of snacks will you need to pack? Will you need to purchase any specialty gear? Do you plan to visit any attractions?)
- A mini-research outline of one geographical region they would pass through (Science - What might you see on your journey? i.e. plants, animals, landscapes)
- Why might someone want to visit there? (Literacy - persuasive writing or advertisement on Google Slides)
- A piece of artwork to represent their journey/destination - i.e. a painting, clay object, picture collage, etc. (Visual Arts)

Curriculum Expectations:

Number Sense and Numeration: Quantity Relationships; Counting; Operational Sense (Estimation); Proportional Relationships

Measurement: Attributes, Units, and Measurement Sense; Measurement Relationships

Geometry and Spatial Sense: Location and Movement (identify and describe the general location of an object in a grid system)

Data Management and Probability: Collection and Organization of Data; Data Relationships (median, describe the shape of data, compare similarities and differences)

References:

Hassinger-Das, B., Jordan, N.C., & Dyson, N. (2015). Reading Stories to Learn Math: Mathematics Vocabulary Instruction for Children with Early Numeracy Difficulties. *The Elementary School Journal*, 116 (2), 242-264.

Kurz, T.L., & Bartholomew, B. (2012). Supporting Math Skills with Children's Stories. *Kappa Delta Pi Record*, 48, 184-188.
Reilly, E., Pagnucci, G. (2007). Mathematics, art, research, collaboration, and storytelling: the high M.A.R.C.S project. *Mathematics Teaching in the Middle School*. 12(9). 497-502.

Mattarella-Micke, A., & Beilock, S.L. (2010). Situating math word problems: The story matters. *Psychonomic Bulletin & Review*, 17 (1), 106-111.

Moyer, P. (2000). Communicating mathematically: children's literature as a natural connection. *The Reading Teacher*. 54(3).