Taking Math Outdoors:
Planning, creating and executing Math Trails

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Why do Math outdoors? What does the research say?

- Provides a powerful context for real-life and applicable learning (Miller et al., 2016 & Moffett, 2011)
- Opportunity for rich integration of other subjects (*ibid*)
- Outdoor learning promotes children's cognitive, personal and social development of children (Moffett, 2011)
- Reduces math anxiety (Moffett, 2011)
- Increases motivation (Miller et al., 2016)

What is a Math Trail?

- Teacher-designed route with various stops
- At each stop, students observe surroundings and connect their observations to math concepts
- Can be done in parks, landmarks, schoolyard etc.
- Uses available material in given environment as stimulus for math activities
- A learning tool to encourage students to observe an environment outside of their classrooms

5th Grade Math Trail
Jennifer Cox
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How are Math Trails beneficial?

- Opportunity for students to apply math they are learning in class to real-life situations and contexts
- Real-life connections allow children to:
  - Appreciate of the significance of mathematics
  - Make the abundance of the Maths that surround them explicit
  - Demonstratethe importance of using Maths as an everyday life skill (Davis, 2004)
- Math trails are a group effort → build interpersonal and collaborative skills
- Consolidates learning and knowledge through practice and making/explaining connections
- Activates learners → onus is on students to make observations and connections, turning students from passive to active learners (McGowen, 2016)
- Motivation!
- Rich, integrated lessons
- Deepens knowledge about the community/environment they are exploring

How to do a Math Trail:

- First, connect students to nature and the outdoors by taking them for a nature walk, or just a walk around the school, playground, or park that you will be visiting later for your math trail
- This is important because it allows student to look at things differently and in a new way the second time around
- During your first walk with the students, ask them to take note of what they see and if they find something interesting, take a photograph
- Go back to the classroom and analyze the photographs taken with the students.
    - First time with "regular eyes" second time with "math eyes"
- After analyzing the photos and discussing the different math concepts with students, you are ready to create a math trail!

Regular vs. Math Eyes

Regular eyes: what do you see in this photograph? (General)

Math eyes: what do you see that connects to mathematics? (Symmetry, patterns, sizes).

Primary

- Teacher marks important "stops" with students
- Teacher creates questions for the "stops" from concepts discussed earlier
- Students go on the same trail they did the first time and answer the questions at each "stop"

Junior

- Students will draw out the trail, marking the important stops that will be made
- Students will then make a list of questions for each "stop". (e.g. how many different kinds of flowers can you see? What is the distance between the two trees?)
- Students go on the same trail they did the first time and answer the questions at each "stop"

Always remember to model to the students the type of questions you want them to ask and the type of thinking as well.

Resources to help you make your own Math Trail!

http://www.haveyougotmathseyes.com/developing-maths-trails/

https://thefutureschannel.com/wp-content/uploads/2016/10/Math-Trail-Futures-Channel.pdf