# Mapping the Neighbourhood: Using Hand-Drawn Maps to Elicit Children's Thinking about Sustainability

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Finding a restaurant when we visit a new city, hiking in the mountains, sketching a route on paper to give someone directions: these are just a few of the ways we engage with maps in our daily lives. Beyond these typical uses, maps have also become important tools for us to navigate challenges related to sustainability and climate change. For example, in recent years, people living throughout North America have regularly turned to air quality maps, as smoke from wildfires has frequently blanketed much of the continent. In this report, which is part of a larger, ongoing research project on sustainability education in primary STEM, we describe how we used maps and mapping as means to elicit elementary students' thinking about sustainability issues in the community in which they lived. The research question guiding this report is: *How do elementary students use maps to make connections between sustainability issues and their daily lives?*

## Using Hand-Drawn Maps to Elicit Children's Thinking about Sustainability

Thinking about sustainability issues in the classroom can be challenging, especially in the early years, because it requires students to make connections between their everyday actions and the consequences of those actions across varying scales of space and time. Drawing has often been used to elicit students' ideas and feelings, especially about complex topics like sustainability and environmental issues (Barraza, 1999). For example, Julien et al. (2018) asked young children to draw two pictures, a preferred version and a probable version, of what a

natural landscape in their community might look like when the students were grandparents. They used drawing to develop students' capacity for future thinking, which they noted is a "skill that today's young people need if they are to make sound choices and develop a sense of responsibility for the future" (Julien et al., 2018, p. 27). We see the process of drawing maps, specifically, as a potentially effective way to support students in thinking about sustainability issues, especially in the context of everyday life. Mapping has frequently been used in participatory research with children because maps are multimodal and can serve as a record of children's experiences in the physical world (Groundwater-Smith et al., 2014).

**Methodology**

We designed a series of lessons focused on understanding sustainability issues through the interpretation and drawing of maps and implemented them in a grade 6 classroom at a public elementary school in a large city in western Canada. Over the course of a semester, we asked students to engage in a variety of mapping activities, including drawing maps of walks we took in the neighbourhood, investigating how to use scale and other mapping conventions, and using maps to identify sustainability issues in the community. In a culminating activity, we asked students to address those sustainability issues and to collaboratively map their redesigned neighbourhood. In this presentation, we report on the maps students created as part of this culminating activity and interviews we subsequently conducted with a subset of the participants about their maps. We performed a qualitative content analysis (Hsieh & Shannon, 2015) of students' maps and the interview transcripts to thematize the connections students made between sustainability issues and their everyday lives.

**Results and Discussion**

Students used their maps to make a variety of connections between sustainability issues and their everyday lives. From our analysis of their collaboratively-drawn maps and interview transcripts, we identified several categories of ways students made those connections, namely through the inclusion of natural spaces, sustainable alternatives to transportation, and the sustainable production and consumption of various resources. In our presentation, we will report on the nuanced ways students made these connections. For example, students used a variety of approaches to include natural spaces in their maps. In some cases, those were tightly embedded into the community, as when students mixed recreational parks and community gardens into

residential areas. On the other end of the spectrum, we found other natural spaces, such as trees and forests, were often positioned at the periphery of student maps and separated from daily life with other man-made or natural structures, such as roads and rivers. Students also identified sustainable transportation options such as bicycle lanes, electric vehicles, and public transportation, as well as alternatives to power generation, such as renewable energy sources like solar panels and wind turbines.

**Connection to the MACAS 2025 Conference Topics**

We see maps and mapping as effective means of integrating mathematics and science to investigate critical issues in STEM classrooms. For example, Cohrssen and Pearn (2021) described how maps can be used to elicit spatial reasoning with younger children. Spatial reasoning has been identified as important to current and future achievement in STEM disciplines (Hawes et al., 2015), and so it is critical for students to develop their spatial skills if we want them to address sustainability in STEM contexts.

## References


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