

Dividing Space

Geometry Playground

Formative Evaluation

Nina Hido

2009

THIS IS **NOT** A DEFINITIVE FINAL REPORT

FORMATIVE evaluation studies like this one often:

- **are conducted quickly**, which may mean
 - small sample sizes
 - expedited analyses
 - brief reports
- **look at an earlier version** of the exhibit/program, which may mean
 - a focus on problems and solutions, rather than successes
 - a change in form or title of the final exhibit/program

Table of Contents

Background	4
Goals	4
Methods	4
Findings	5
Overview of what is working well	5
To Discuss	5
Recommendations	6
Next Steps	6
Acknowledgements	7

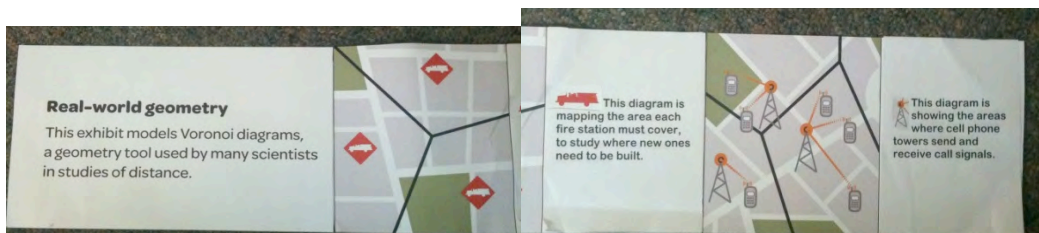
Dividing Space (Plinko)

Hido

2009



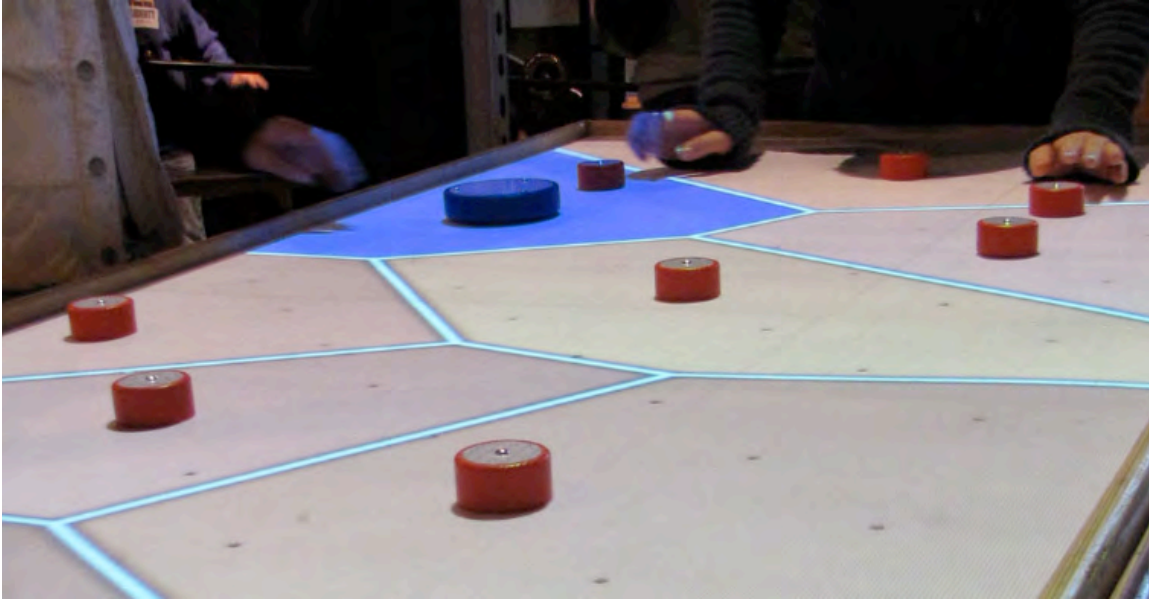
Exhibit



Side Label

Background

Dividing Space is an exhibit in the Geometry Playground Exhibition. Visitors experience how a voronoi diagram responds in real time to the changing positions of objects on a play-table. Through play, visitors have increased understanding that changes in one cell impact adjacent cells, and have an opportunity to predict those changes.



Voronoi Diagram projected on the exhibit's play-table

Goals

The goal of this evaluation is to:

- Observe how visitors use the exhibit with the addition of the new side labels
- Explore whether or not visitors are asking for the goal of the exhibit
- Look for next steps for the exhibit to continue to improve upon it

Methods

On Sunday, Oct 11, 2009 an evaluator went out on the floor and interviewed 10 visitors. 9 adults and 1 kid (age 9). One adult was ESL.

Label changes made prior to the floor test:

Side label:

1. The sequence of the two diagrams was swapped. The fire truck is the simpler graphic and the cell tower a bit more visually complex, so the label moves from

- most simple to more complex as you move from left to right.
2. The cell phone icon was changed to a cell phone tower icon so it aligned with the idea/metaphor that the tower is akin to a peg in the exhibit.
 3. The wording, “This is a diagram...” was added to each of the graphics descriptions to make a complete sentence (it had been a sentence fragment previously).

Main label:

1. We tried the label with the ‘make the blue section big and small’ activity. We needed to get a very clear read on whether visitors were still asking for a goal. Because in past evaluations, visitor goal requests have been about activity and/or real world connections, we did not want to risk the lack of activity leading to requests for a goal.

Findings

Overview of what is working well

1. Visitors use the main label first and use the side label as the secondary label. This was our intent.
2. Visitors do not think the exhibit is about fire stations or cell phone towers. This is great as it was a concern that the examples would be perceived too literally.
3. Visitors did not request a goal as they did in previous evaluation and research (see below).
4. Through observations, at least 4 visiting groups tried the activity. They seemed to be engaged with the blue big/small activity.
5. When visitors were asked what they believed the side diagrams were illustrating, the visitors could interpret the diagram correctly. Following are two sample responses to the question, “Can you say in your own words what you think this diagram shows?”:
 - The area fire stations need to cover.
 - How the tower signals to a specific area.

To Discuss

1. Unlike in previous iterations, the visitors were not asking about the purpose of the exhibit, however some visitor responses (5-6) suggested that they had a lack of clarity around our description of the rule. It seemed as though visitors eventually got it, but there was some confusion. These 3 visitor responses help illustrate the nature of the confusion:
 - Confusing, why is there a line, it could be explained better.

- I was just generally confused. I understand the purpose, but in terms of math modeling, not just here for me. Hard to figure out.
 - It is hard to understand, the explanation. Initially - what is it trying to display? Took a while to figure out what is going on.
2. When visitors were asked what they believed the main diagram was illustrating, the visitors had a difficult time interpreting the graphic.
 3. During the day of testing, the calibration of the software was off such that the lines weren't halfway between all pegs. Now that the label directs visitors to notice the exact position of the line, does this raise concerns that there is too much pressure on the software to run perfectly? Also, this *may be* influencing visitor's understanding of the rule description (that is, if they are not seeing what they understand to be the rule, and they may interpret the description to be unclear).

Recommendations

Things to keep in mind as we build this out the exhibit:

1. About half of the visitors seemed to be straining to read the label, not sure if this is about the light level or the point size of the font.
2. Consider adding phonetic spelling of the word "voronoi" since we know from past evaluations and our research data that visitors have a hard time saying that word.
3. Notice our use of bold type. At least one visitor was drawn first to the bold "rule" paragraph before she used the 'try this text' on the left hand side, and reported that this led to confusion since this is not our intended order of use.

Next Steps

We propose that the team's writer and the evaluator go out on the floor for a short rapid label prototyping session. This feels like a good opportunity to use visitor conversations to glean language that best helps visitors understand the rule. Their wording could be used to tweak the tag line and the rule paragraph.

Once we find language that better helps visitors understand the rule, work with the graphic artist to create a diagram that best supports this description. (Given tight time restrictions, we most likely we won't be able to floor test a new diagram.)

Acknowledgements

This material is based upon work supported by the National Science Foundation under Grant number NSF/DRL 0610436. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

