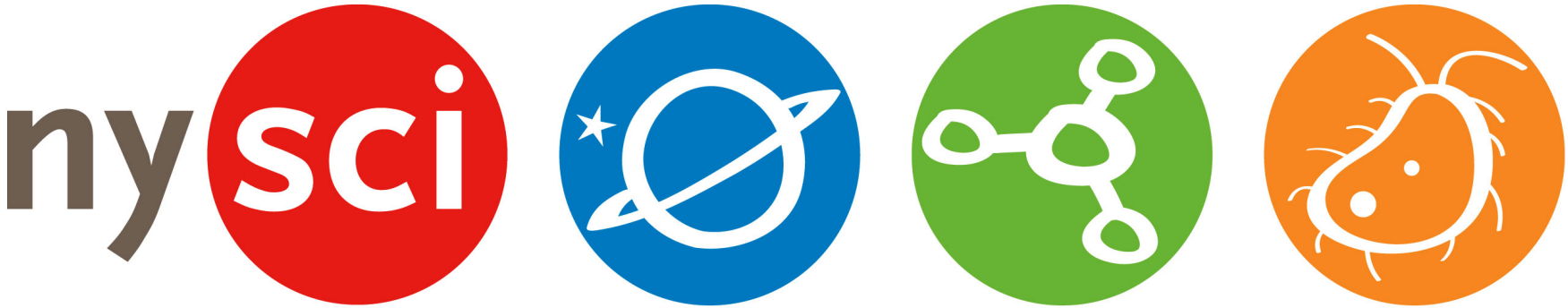

nysci

Data Modeling with Young Learners and their Families (Big Data for Little Kids)

Visualizing STEAM Data in Support of Smart Decision Making

DRL1614663

Science Centre World Summit, 2017 Session CS0049

Research: Questions

Design and develop a 6-week workshop curriculum that will deepen our understanding of:

- How do 5-8 year-olds define, collect, represent, interpret data?
- How do parents engage with children in data inquiry activities?

…in an informal learning environment

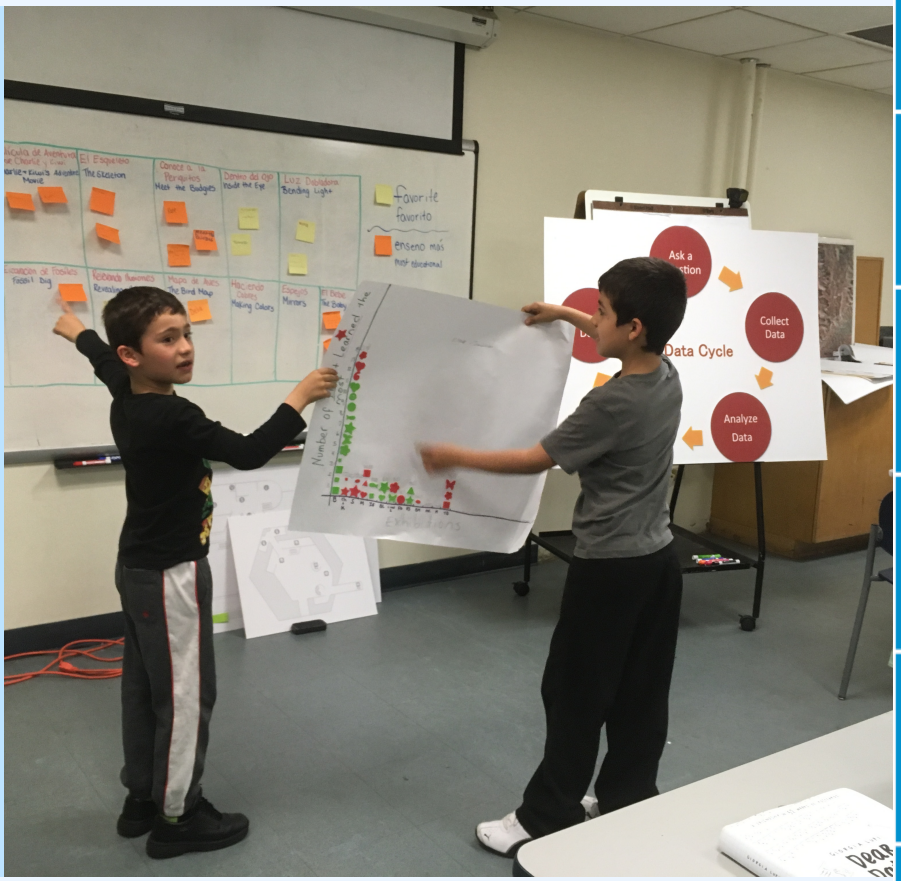
Research: Goals

- Create a meaningful learning experience through scientific inquiry that centers on key concepts of data modeling
- Observe how families support young children's emergent thinking about why and how to gather and use data

Museum Makers: Designing with Data

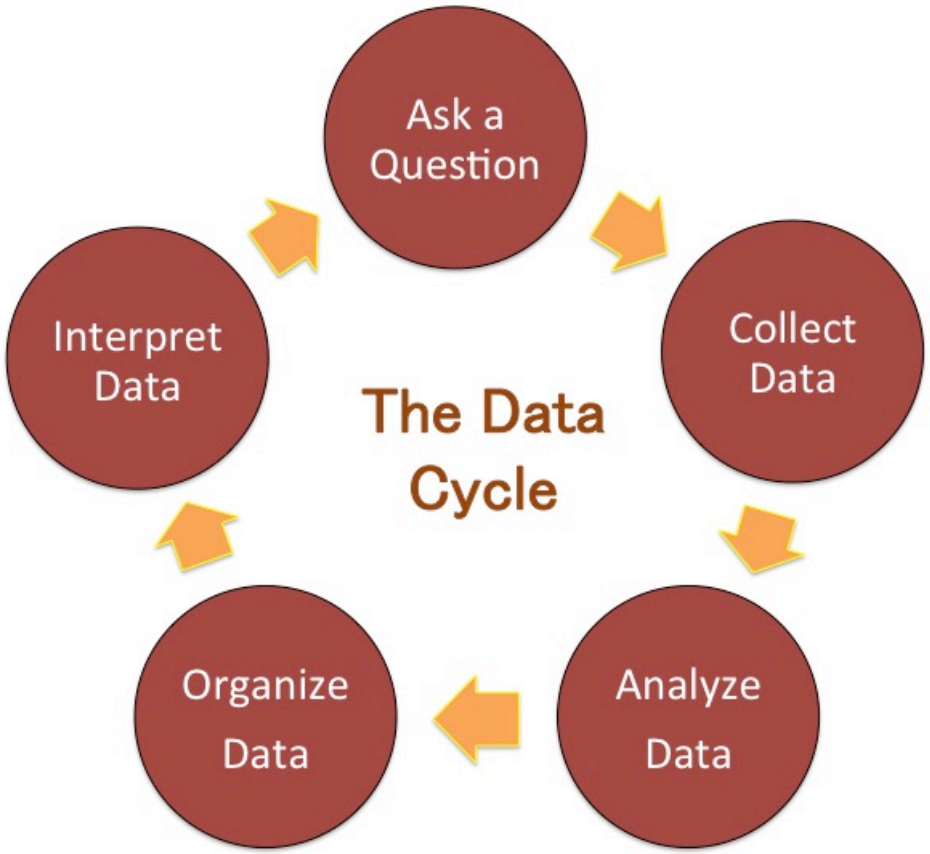
- 8 families, 4 Spanish-speaking
- 12 children
- 6 workshops, each 2 hours, once a week for 6 weeks
- "Make your own museum exhibit"

Museum Makers: Designing with Data



Workshop		Theme Questions	Activities
1	Introduction	What your exhibit should be about?	Exploring two exhibitions in the museum. Ask children to find one favorite exhibit and one that taught them the most.
2	Measurement (Size)	How big your exhibit should be?	Measuring sizes. Families use different measurement tools to measure size of exhibits on museum floors.
3	Measurement (Time)	How long will people stay at your exhibit?	Timing activities. Families use stopwatch to time how long people stay or interact with exhibits.
4	Feature	How does you exhibit work?	Identifying features. Families identify different features included in exhibits (e.g., buttons, switches, lights, etc.).
5	Making	How to design your exhibit?	Designing and making exhibits. Families plan their exhibits and use materials provided to create them together.
6	Presentation		Children present their exhibits on the museum floor.

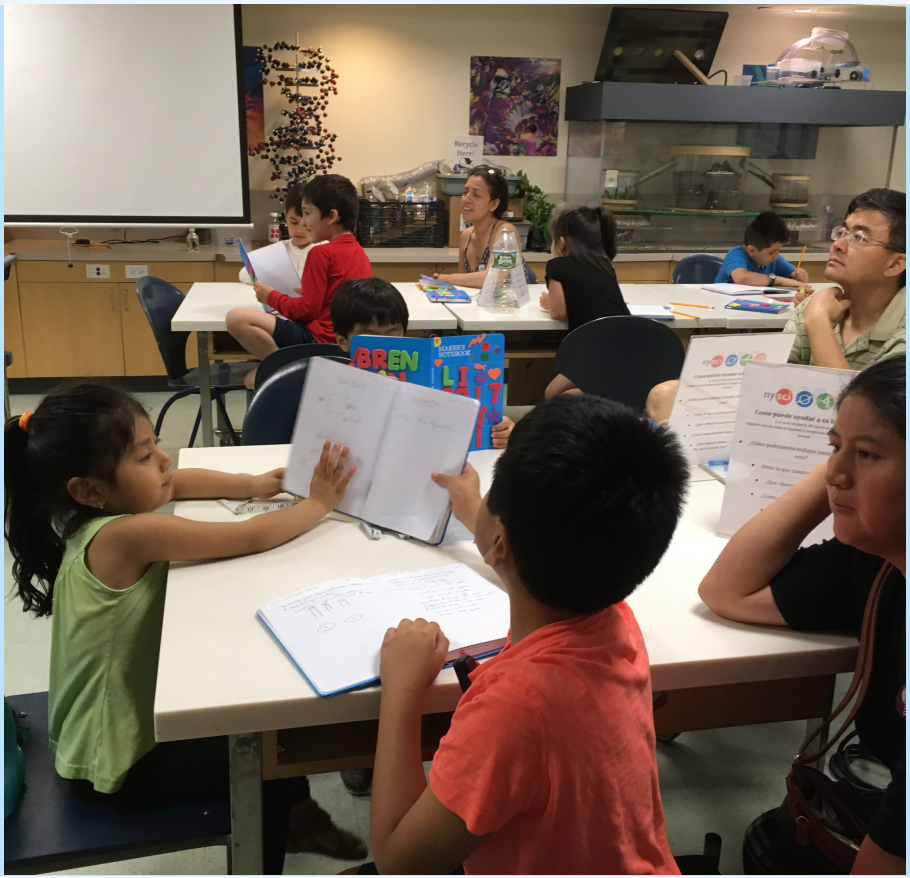
Museum Makers:
Designing With Data



Data cycle:

- Start with asking a question!
- Collect
- Analyze
- Organize
- Interpret

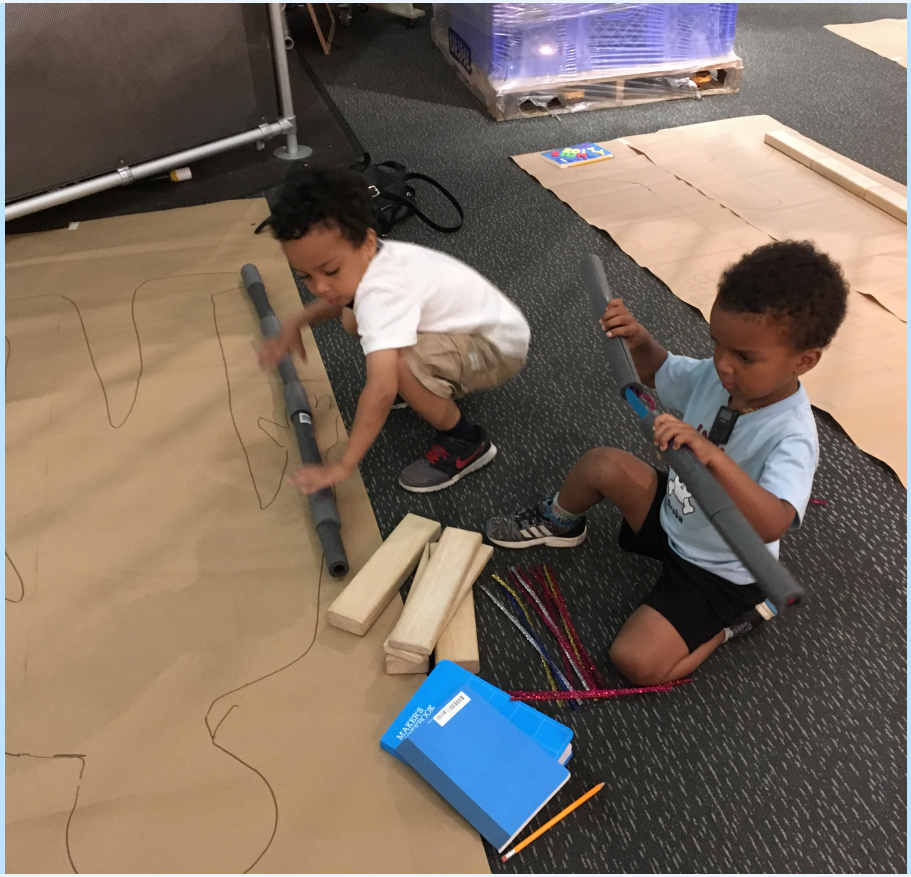
Research:
Data Collection



Data collection:

- Observations
- Field notes
- Video recordings
- Audio recordings
- Interviews
- Artifacts

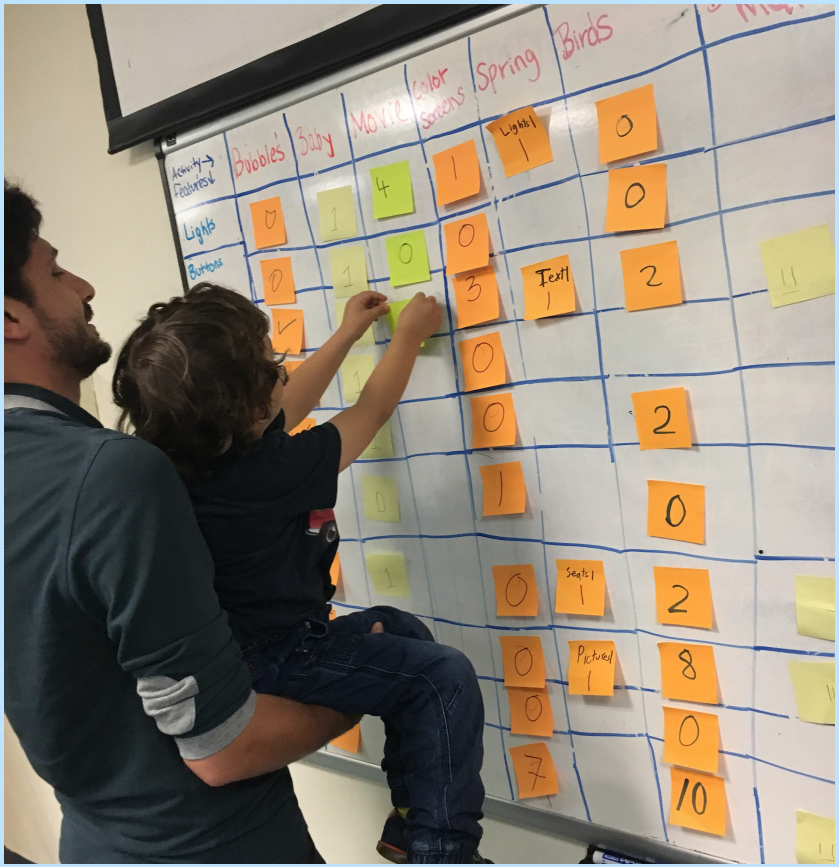
Research:
Data Analysis



Qualitative, content analysis & inductive

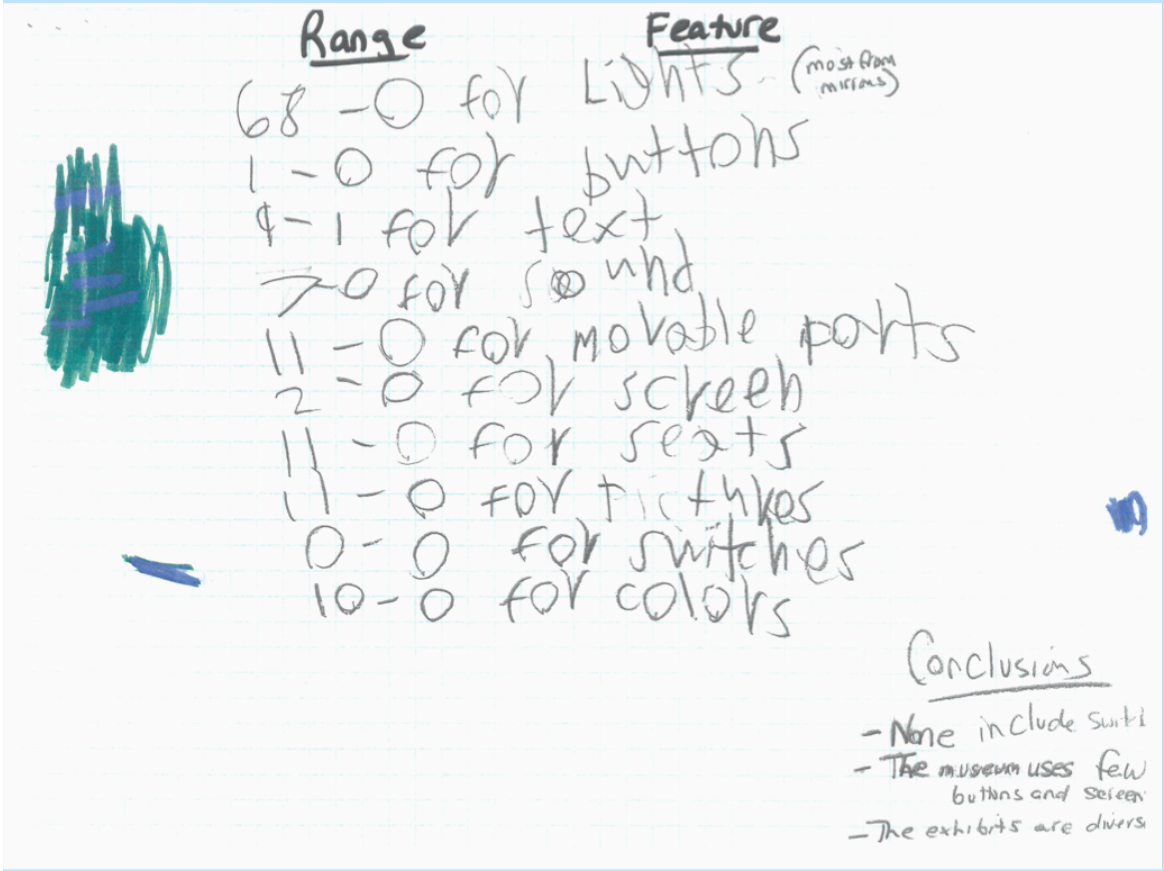
- "Moments of engagement"
- Conversations
- Parent-child interactions
- Emerging themes

Research:
Findings



- Sustained family engagement.
- Workshop environment was valuable
- Activities were authentic
- Parents actively supported learning
- Parents supported autonomous learning.

Artifacts



Range Feature

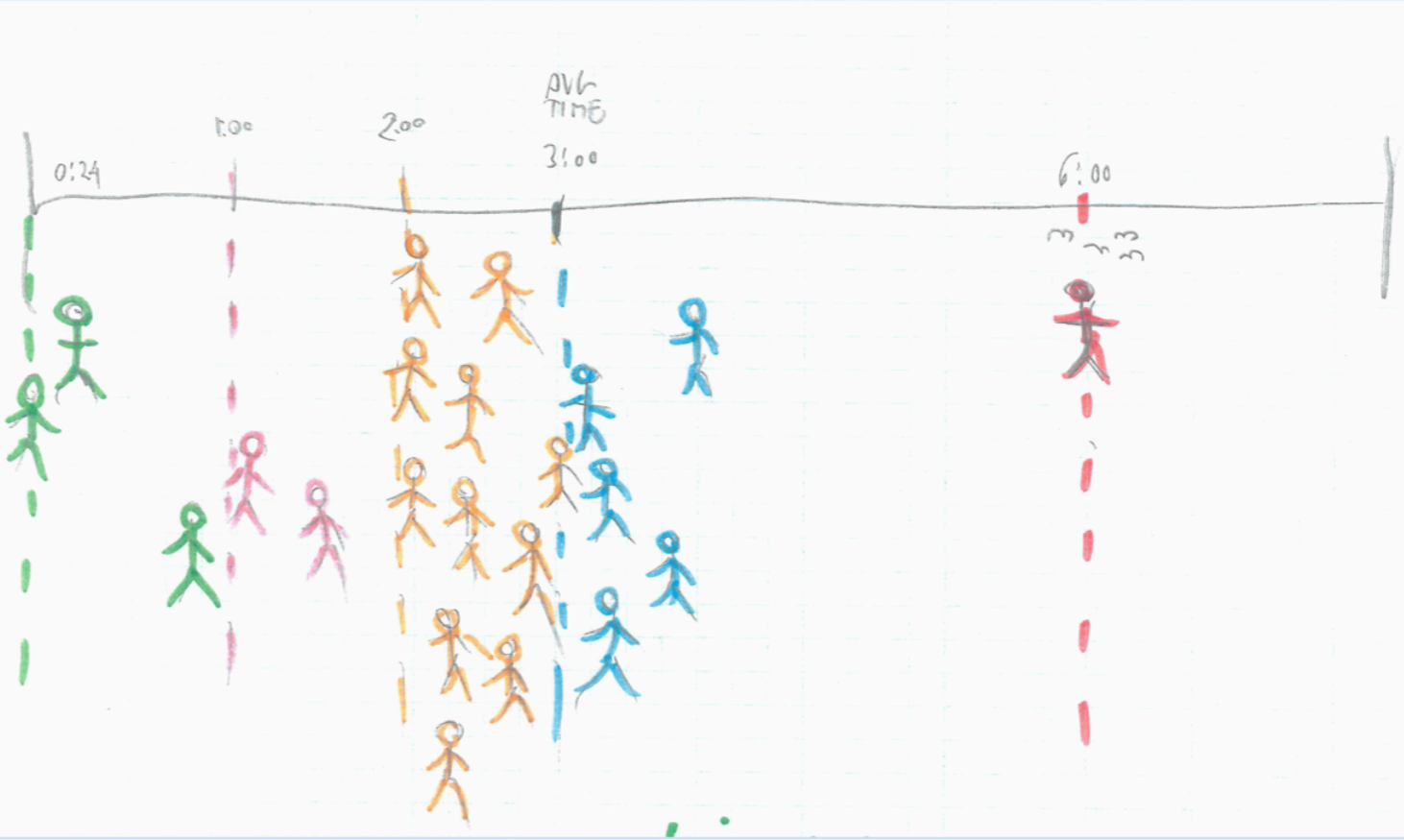
68 - 0 for Lights (most from mirrors)
1 - 0 for buttons
4 - 1 for text
7 - 0 for sound
11 - 0 for movable parts
2 - 0 for screen
11 - 0 for seats
11 - 0 for pictures
0 - 0 for switches
10 - 0 for colors

Conclusions

- None include switches
- The museum uses few buttons and screens
- The exhibits are divers

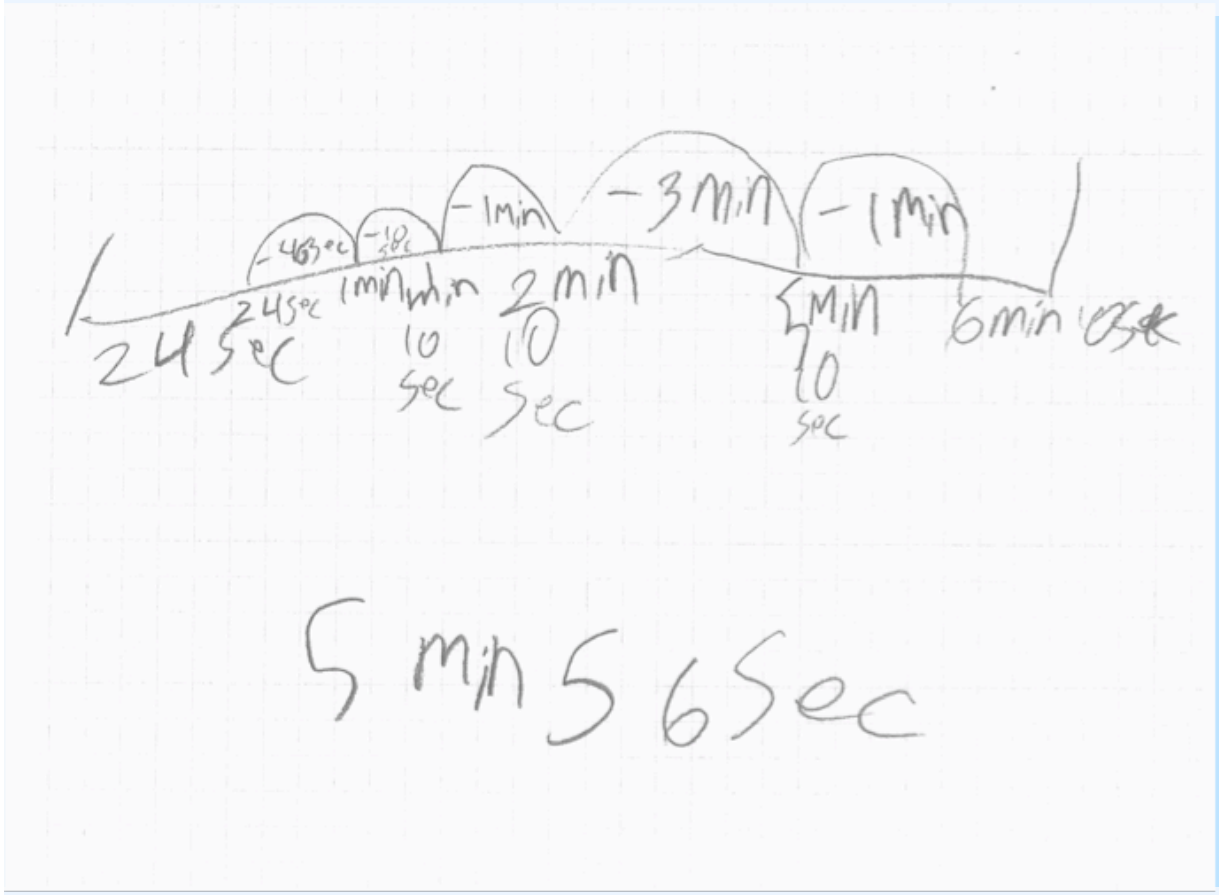
Tabular data

Artifacts



Spatial data

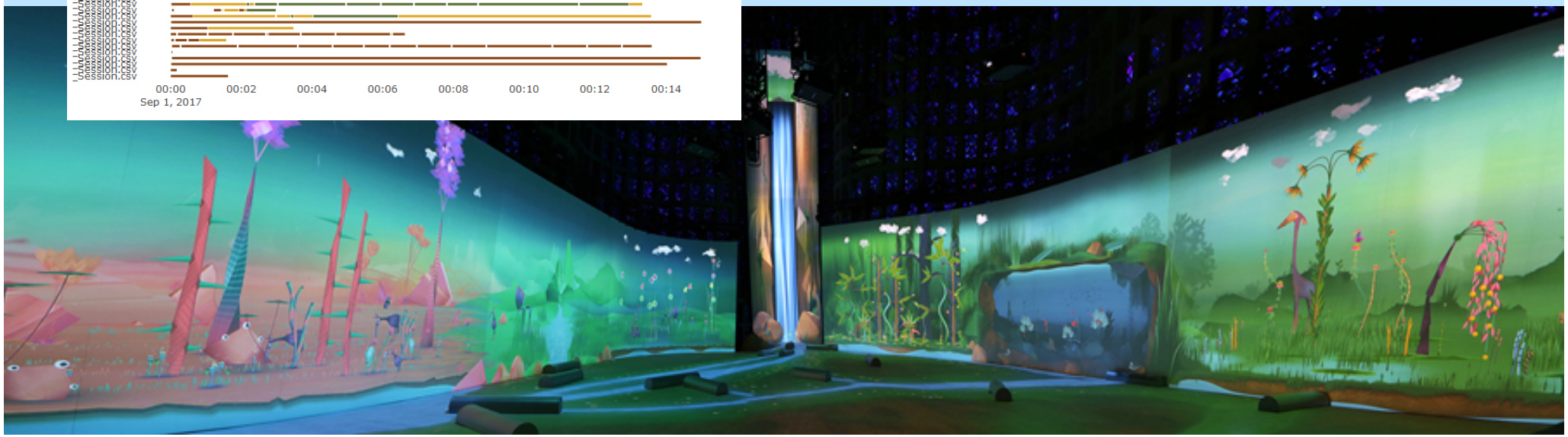
Artifacts



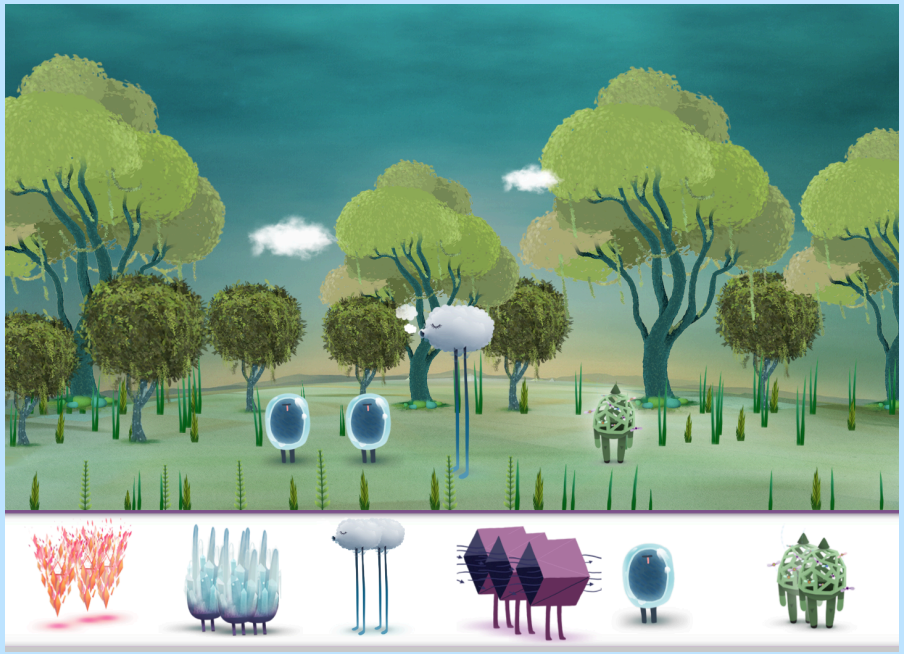
Temporal data

Other Projects:
Connected Worlds

Using log data to compute diversity, sustainability and tipping points



Other Projects:
The Pack



Computational thinking in an open-world environmental game

Other Projects:
Northeast Big Data Innovation Hub

Big data literacy

NORTHEAST
BIG DATA
INNOVATION HUB

New York Hall of Science

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